# Final Certification Report

# Construction Quality Assurance Services

## Cell 2G Construction
## Geosynthetic Component Construction
## Charlotte Motor Speedway Landfill V
## Cabarrus County, North Carolina

Prepared For:

ALLIED WASTE

Prepared by:

ACC of NORTH CAROLINA, PLLC

August 2008

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# SECTION 1

# Introduction

# SECTION 1
# Introduction

## 1.1 Project Description

Allied Waste currently owns and operates the Charlotte Motor Speedway Landfill V located in Cabarrus County, North Carolina. Cell 2G is a solid waste disposal cell encompassing approximately 13 acres of composite lined area. This report documents construction quality assurance (CQA) monitoring and testing services performed during the construction of the geosynthetic components (GCL, HDPE geomembrane, geocomposite, geotextile and leachate collection layer) for Cell 2G. The soil components (prepared subgrade, structural fill and clay liner) for Cell 2G were covered under a separate certification report which was submitted in July 2008.

The geosynthetic composite lining system for Cell 2G includes, from bottom to top:

- A Geosynthetic Clay Liner (GCL);
- A 60-mil thick textured High Density Polyethylene (HDPE) geomembrane liner;
- A double sided geocomposite drainage layer; and
- A 2-foot thick protective cover layer.

## 1.2 Scope of Services

ACC of North Carolina, PLLC (ACC) was retained by Allied Waste to provide Construction Quality Assurance (CQA) monitoring and testing services during construction of the GCL, HDPE geomembrane, geocomposite, geotextile and leachate collection layer.

The CQA services provided during construction of Cell 2G were performed in accordance with the following project documents:

- Drawing Numbers 1 to 12 inclusive, entitled "Charlotte Motor Speedway Landfill – Cell 2G Construction," prepared by Brown & Caldwell, Inc. and dated March 2008 (referenced to in this report as the Construction Drawings).

- "Permit Modification Application Construction Quality Assurance Plan, BFI – Charlotte Motor Speedway Landfill V Lateral Expansion – Cells 2F, 2G &2H" prepared by Almes & Associates, Inc. dated May 2004 (referenced to in this report as the CQA Plan).

Over the course of this project, one modification letter was submitted by B&C concerning the revision to the geocomposite specification in Cell 2G. A copy of this letter is included in Appendix A.

For the purposes of clarity, the above documents and submitted modification letter have been collectively referred to throughout the text of this report as the "Project Specifications."

This report describes the technical approach taken by ACC to provide CQA services during the construction of the geosynthetic components of Cell 2G. Also included with this report are the results of field testing, field observations and laboratory test results. Finally, the report contains a certification statement, which confirms that the geosynthetic components of Cell 2G were constructed in accordance with the approved design and operation plans, construction quality assurance plan, project specifications and the facility's solid waste permit.

## 1.3 CQA Project Personnel

The ACC on-site CQA team consisted of one full-time Resident Manager who was on-site during the Cell 2G construction. The resident manager was assisted by additional monitors as needed during the geosynthetic installation portion of this project.

The ACC CQA personnel coordinated their activities on a day-to-day basis with the ACC Project Engineer. Overall supervision of ACC's services was provided by the certifying engineer, a Registered Professional Engineer (State of North Carolina) from ACC. A listing of ACC project personnel, along with their initials, used on field and summary documentation, is included in Appendix B.

Copies of the Resident Manager's daily field summary reports are included in Appendix C.

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# SECTION 2

## Construction Overview

# SECTION 2
# Construction Overview

## 2.1 Project Participants

The principal project participants during the construction of the soil components of the Cell 2G construction at the Charlotte Motor Speedway Landfill V consisted of:

- Allied Waste, as owner and operator of the Charlotte Motor Speedway Landfill V facility;
- Brown & Caldwell, Inc. (B&C), as the design engineer during construction of Cell 2G;
- ACC of North Carolina, PLLC (ACC), as the CQA Consultant during construction of Cell 2G;
- Timely Engineering Soil Tests, LLC (TEST), as the geotechnical laboratory for the testing of the soils components of this project;
- TRI Environmental, Inc. (TRI), as the geotechnical laboratory for the testing of the geosynthetic components of this project;
- Earnhardt Grading, Inc. (EGI), as general contractor for the construction;
- Environmental Specialties International, Inc. (ESI), as the installer for the geosynthetic components of this project;
- F. Donald Lawrence & Associates, Inc. (FDLA), as the Registered Professional Land Surveyor (North Carolina).

## 2.2 Geosynthetics Installation

ESI began the geosynthetic clay liner and geomembrane liner installation for Cell 2G on June 9, 2008, and completed installation on June 21, 2008. The geosynthetics liner system consists of approximately 567,000 square feet of GCL and geomembrane materials covering all of Cell 2G. All installation procedures were in compliance with the Project Specifications. A copy of the geomembrane panel layout sketch, prepared by ACC is presented as Figure 1.

## 2.3 Leachate Collection System Installation

Construction of the leachate collection system in Cell 2G began on June 23, 2008 and was completed on July 24, 2008. The leachate collection system construction started with geocomposite installation. Approximately 567,000 square feet of geocomposite was installed on the floor and sideslopes of Cell 2G. The geocomposite was installed directly on top of the 60-mil HDPE geomembrane. The leachate

collection drain was surrounded by No. 57 stone and encapsulated with geotextile. Protective cover material was placed directly on top of the geocomposite. Approximately 42,000 cubic yards of protective cover material was placed on the floor and sideslopes of Cell 2G.

A record drawing showing the final grades of the leachate collection layer material, entitled "Grade Verification Survey of CMS Cell 2G – Protective Cover Soil" was provided to ACC by FDLA and is presented as Figure 2.

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# SECTION 3

## Geosynthetic Conformance Test Results and Manufacturers' Quality Control Submittals

# SECTION 3
# Geosynthetic Conformance Test Results and Manufacturers' Quality Control Submittals

## 3.1 Geomembrane

Samples of the 60-mil thick HDPE geomembrane materials used for Cell 2G were obtained by TRI for laboratory testing to verify conformance with the Project Specifications. The geomembrane samples were obtained at the frequencies stated in the project specifications. Approximately 567,000 square feet of 60-mil thick HDPE geomembrane material was used the site. The tests were performed in accordance with the standard test procedures defined in the Project Specifications.

The conformance test results and quality control data were reviewed by ACC and compared to the Project Specifications. Based on the review, the test results for the geomembrane complied with the values detailed in the Project Specifications. A summary of the conformance test results for the geomembrane material is provided in Appendix D, Section D-1. A summary of the quality control data for the geomembrane material is provided in Appendix E, Section E-1.

## 3.2 Geosynthetic Clay Liner

Samples of the GCL materials used for Cell 2G were obtained by TRI for laboratory testing to verify conformance with the Project Specifications. The GCL samples were obtained at the frequencies stated in the project specifications. Approximately 567,000 square feet of GCL material was used at the site. The tests were performed in accordance with the standard test procedures defined in the Project Specifications.

The conformance test results and quality control data were reviewed by ACC and compared to the Project Specifications. Based on the review, the test results for the GCL complied with the values detailed in the Project Specifications. A summary of the conformance test results for the GCL material is provided in Appendix D, Section D-2. A summary of the quality control data for the GCL material is provided in Appendix E, Section E-2.

## 3.3 Geocomposite

Samples of the geocomposite material used for Cell 2G were obtained by TRI for laboratory testing to verify conformance with the Project Specifications. The geocomposite samples were obtained at the frequencies stated in the project specifications. Approximately 567,000 square feet of geocomposite material was used at the site. The tests were performed in accordance with the standard test procedures defined in the Project Specifications.

The conformance test results and quality control data were reviewed by ACC and compared to the Project Specifications. Based on the review, the test results for the geocomposite complied with the values detailed in the Project Specifications. A summary of the conformance test results

for the geocomposite material is provided in Appendix D, Section D-3. A summary of the quality control data for the geocomposite material is provided in Appendix E, Section E-3.

## 3.4 Geotextile

Samples of the geotextile materials used for Cell 2G were obtained by TRI for laboratory testing to verify conformance with the Project Specifications. The geotextile samples were obtained at the frequencies stated in the project specifications. Approximately 567,000 square feet of geotextile material was used at the site. The tests were performed in accordance with the standard test procedures defined in the Project Specifications.

The conformance test results and quality control data were reviewed by ACC and compared to the Project Specifications. Based on the review, the test results for the geotextile complied with the values detailed in the Project Specifications. A summary of the conformance test results for the geotextile material is provided in Appendix D, Section D-4. A summary of the quality control data for the geotextile material is provided in Appendix E, Section E-4.

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# SECTION 4

## Geosynthetics Installation Monitoring

# SECTION 4
# Geosynthetics Installation Monitoring

The ACC monitoring staff during the geosynthetics installation in Cell 2G consisted of the Resident Manager and additional Geosynthetics Monitors as needed.

The CQA monitoring services that ACC provided consisted of:

- Review of conformance test data and the geosynthetic manufacturers' quality control certificates for the geomembrane, geosynthetic clay liner, geocomposite and geotextile materials;
- Observation of geosynthetic clay liner installation: deployment, seaming, and handling;
- Visual examination and documentation of geomembrane panels during deployment;
- Observation and documentation of geomembrane trial seams and evaluation of the test results;
- Observation and documentation of geomembrane seaming operations;
- Observation and documentation of geomembrane non-destructive seam continuity testing;
- Selection of sample locations for geomembrane destructive seam strength testing; and
- Evaluation of geomembrane laboratory seam strength testing results.

Detailed descriptions of each of the above monitoring duties are presented in the following sections. Summaries of the field and laboratory data collected by ACC during Cell 2G geosynthetics installation have been included in Appendices F through N.

## 4.1 Deployment Monitoring

During deployment of the geosynthetic clay liner and geomembrane panels in Cell 2G, ESI signed Certificates of Acceptance of Soil Surface, which are presented in Appendix F. Geomembrane panels were individually monitored by ACC personnel during deployment from the rolls. This process consisted of observation of geomembrane panel alignment, panel overlap, panel surface quality, and panel identification (roll and panel number). The ACC CQA Monitor labeled the individual panels P-1 through P-152 inclusive. Deployment of the geomembrane, geosynthetic clay liner and geocomposite was accomplished with the use of a rubber-wheeled front-end loader and/or manual labor.

In general, the Project Specifications for the geosynthetic clay liner for Cell 2G require that: i) only rolls that are to be placed and covered by geomembrane that day shall be unrolled; ii) the surface should be free of rock or other foreign materials larger than 3/4-inch in diameter; iii) after rolls are in place, as many wrinkles as possible shall be removed; and iv) adjoining panels shall have at least a 6-inch overlap along the length of the GCL and have at least a 24-inch overlap along the width of the GCL.

In general, the Project Specifications for the geomembrane liner for Cell 2G require that: i) only panels that are to be seamed together that day shall be unrolled; ii) panels shall be positioned with a minimum 3-inch overlap for extrusion welds and 5-inch overlap for fusion welds; iii) no horizontal seams be placed on slopes or within five feet of the toe or crest of the slope, iv) after panels are in place, as many wrinkles as possible shall be removed; and v) liner be allowed to "relax" before field seaming.

There were no defects observed in any of the geosynthetic materials that were the result of manufacturing, shipping, or deployment. Following deployment, sand bags were used to temporarily anchor the geomembrane panels until they were permanently joined. A plan view sketch of the geomembrane panel layout for Cell 2G is presented as Figure 2. A summary of the geomembrane panel deployment monitoring log is presented in Appendix G.

## 4.2 Trial Seam Monitoring

Geomembrane trial seaming was performed by the ESI technicians approximately every four to five hours to verify the adequacy of the seaming apparatus, operators, and procedures. Each trial seam was sampled and tested by the installer for peel adhesion (peel) and bonded seam (shear) failure modes. The trial seaming was observed and documented by ACC personnel. Summaries of the trial seam results for both the fusion and extrusion methods are presented in Appendix H.

## 4.3 Seam Monitoring

The principal seaming method used for joining of the geomembrane panels was the automated double-track fusion seaming process. The extrusion method was utilized for smaller seam lengths, patches, repairs, and intersection of fusion seams.

Monitoring of the seaming methods consisted of frequent visual observation of the seaming procedures, visual examination of the completed seam, and verification that the seam was welded for its entire length. Seaming imperfections were marked and subsequently repaired in accordance with the Project Specifications. Summaries of the fusion and extrusion seam monitoring logs are presented in Appendix I.

## 4.4 Non-Destructive Seam Continuity Testing and Repair Monitoring

All seams, seam repairs and patches were non-destructively tested for continuity by the installer using the air pressure method for double-track fusion seams and the vacuum box method for extrusion seams. Each repair was assigned a unique number to facilitate data tracking and location of all repairs. ACC observed the testing procedures and documented the progress of all non-destructive continuity testing. Monitoring and documentation of defects and associated testing of repairs are summarized in Appendices J and K, respectively.

The results of all seam pressure and vacuum testing are presented in Appendices L and M, respectively.

## 4.5 Destructive Seam Strength Testing

Destructive seam samples were taken by ACC in accordance with the Project Specifications at a minimum average frequency of one test per 500 linear feet of completed seam. Each destructive sample was divided into three sections; namely, one 12-inch long section was retained by ESI, one 12-inch long section was retained by Allied Waste, and the third 18-inch long section was shipped to the TRI geosynthetics laboratory for testing in accordance with the Project Specifications.

The destructive samples received by the TRI Laboratory were divided into ten (10) specimens; five (5) for bonded seam strength (shear) testing and five (5) for peel adhesion (peel) testing. For the double-track fusion samples, each track was tested as a separate destructive test resulting in five (5) shear tests and ten (10) peel tests. The specified strength acceptance criteria for shear testing was that specimens must have yield strengths greater than or equal to 126 pounds per inch of specimen width. The strength criteria for peel testing was that specimens must have yield strengths greater than or equal to 82 pounds per inch of specimen width. All of the destructive samples were tested and evaluated in accordance with the acceptance criteria detailed in the Project Specifications.

During geomembrane installation, a total of sixty-one (61) initial seam destructive samples were obtained from approximately 27,320 linear feet of completed fusion seams. This results in an average testing frequency of one test per 448 linear feet of fusion welding. All of the fusion test samples met or exceeded the required test values per the project specifications.

A total of ten (10) destructive samples were obtained from approximately 4,000 linear feet of extrusion seams associated with the geomembrane repairs. This results in an average testing frequency of one test per 400 linear feet of extrusion welding. Only destructive sample number DX-5 failed initial testing. This sample was subsequently bound by DX-5A3 in the forward direction and DX-5B1 in the backwards direction. All areas represented by this failing destructive test were reconstructed or repaired and then non-destructively tested.

Summaries of the destructive test results for fusion and extrusion welds are presented in Appendix N.

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# SECTION 5

# Leachate Collection System Construction

# SECTION 5
# Leachate Collection System Construction

During the leachate collection system construction in Cell 2G, ACC monitoring staff consisted of the Resident Manager as site activities required. The CQA monitoring services that ACC provided consisted of:

- Review of the geotextile and geocomposite manufacturers' quality control services;
- Visual examination of the geotextile, geocomposite and piping during deployment.
- Observation of the geocomposite and geotextile seaming operations;
- Observation of the HDPE pipe welding;
- Monitoring and documenting the placement of the leachate collection stone and protective cover layer material to insure that no damage was caused to the geotextile, geocomposite and HDPE piping;
- Monitoring the incoming protective cover layer material for any debris that could cause damage to the underlying geosynthetic materials; and
- Confirming that no damage was caused by wrinkles in the geocomposite and 60-mil HDPE geomembrane being covered by the leachate collection layer material.

## 5.1 Protective Cover Layer Testing

Prior to the protective cover layer installation, representative samples of the material were obtained from the proposed borrow sources for laboratory testing. A total of six (6) samples were obtained. The samples were labeled PC-1 through PC-6. The laboratory testing program was comprised of particle size analysis ASTM D422. The laboratory testing met the requirements of the project specifications. The results of this testing are presented in Appendix O.

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# SECTION 6

# Record Survey

# SECTION 6
# Record Survey

A record ("as-built") survey was conducted during Cell 2G construction by a Registered Professional Land Surveyor (North Carolina) from F. Donald Lawrence & Associates, Inc. to certify that the thickness, lines, grades and survey tolerances for the protective cover layer met the Project Specifications. The survey was conducted using a system of field stakes that represented critical points in defining the shape of Cell 2G. As mentioned previously, the survey drawing was provided to ACC by FDLA and is included in this report as Figure 2.

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# SECTION 7
# Certification

# SECTION 7
# Certification

ACC of North Carolina, PLLC was retained by BFI Waste Systems of North Carolina, Inc., a subsidiary of Allied Waste Industries, Inc. to provide CQA services during the construction of the geosynthetic components for Cell 2G at the Charlotte Motor Speedway Landfill V located in Cabarrus County, North Carolina. Services rendered consisted of construction quality assurance monitoring and testing during construction and installation of the GCL, HDPE geomembrane, geocomposite, geotextile and leachate collection layer. The ACC Registered Professional Engineer (North Carolina) performed an on-site visit and reviewed the data during construction.

Based on the results of the CQA activities performed by ACC and described in this report, I certify that the GCL, HDPE geomembrane, geocomposite, geotextile and leachate collection layer in Cell 2G of the Charlotte Motor Speedway Landfill V facility was constructed in compliance with the approved design and operation plans, construction quality assurance plan, project specifications and the facility's solid waste permit.

ACC of North Carolina, LLC

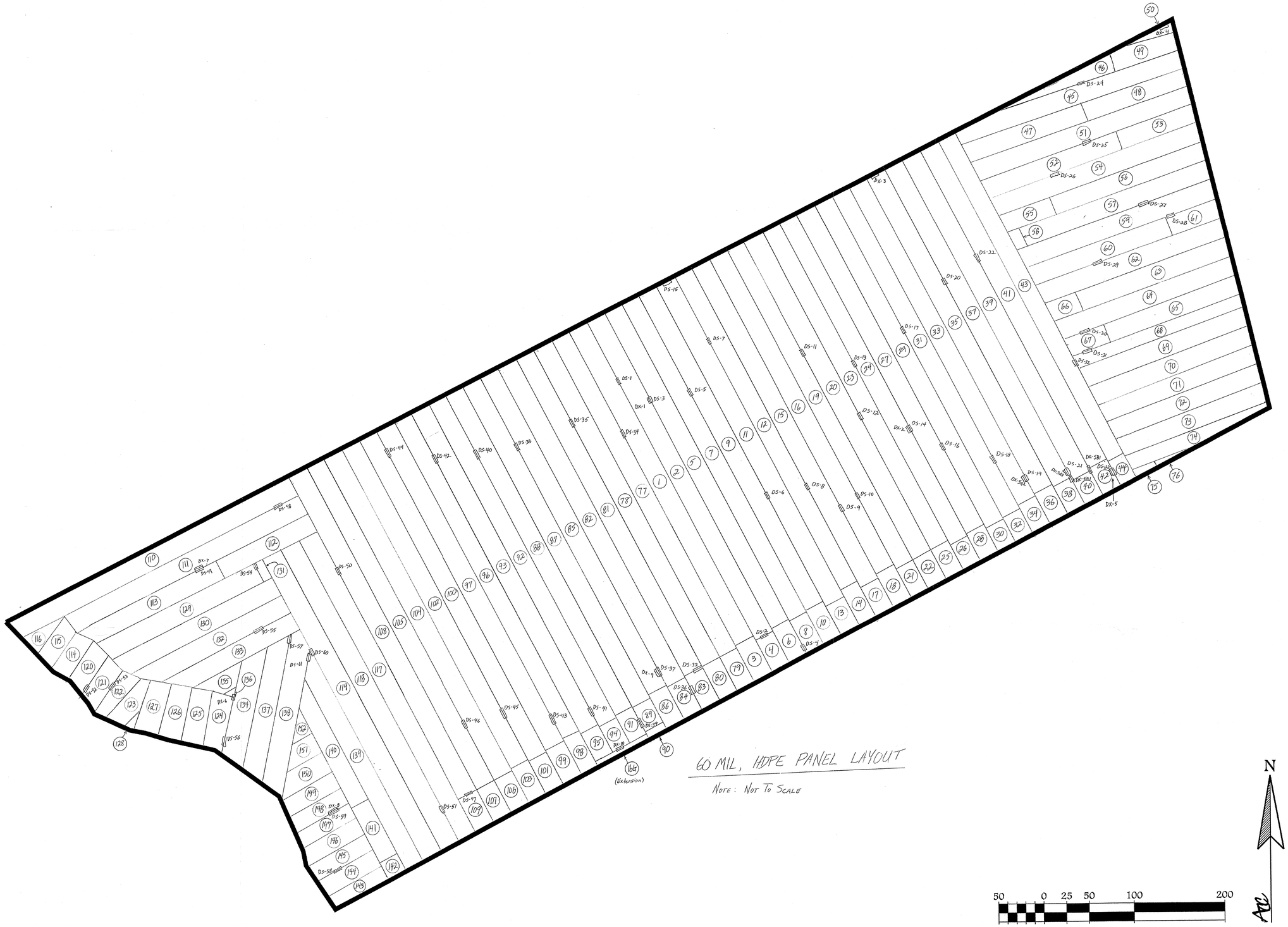
R. Scott Callaway
Project Engineer

Richard T. Deason, P.E.
Certifying Engineer

NORTH CAROLINA PROFESSIONAL SEAL 032852 ENGINEER RICHARD T. DEASON

RSC/RTD:ods

# Figures




60 MIL, HDPE PANEL LAYOUT

Note: Not To Scale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PROJECT:

CHARLOTTE MOTOR SPEEDWAY LANDFILL PHASE V

Cell 2G Construction Documents


ALLIED WASTE
5105 Morehead Road
Concord, NC 28027


REVISIONS

Drawn by: TJS

Checked by: RSC

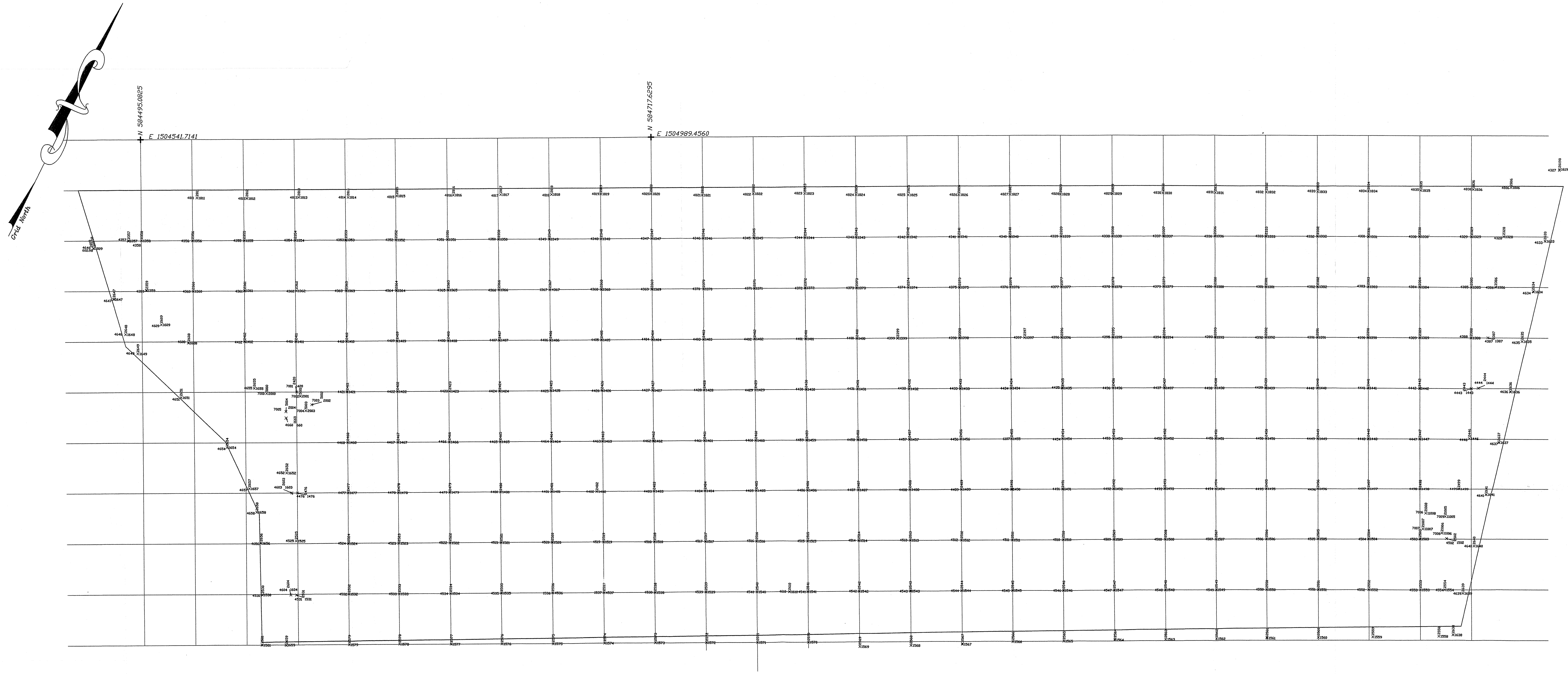
PROJECT NUMBER:

A011-102

March 2008

60-Mil HDPE Geomembrane Panel Layout Sketch

SHEET 1 OF 1

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| 1394 | 599.20 | 2394 | 600.76 | 1.56 | 4394 | 603.00 | 2.24 |
| 1395 | 600.10 | 2395 | 601.70 | 1.60 | 4395 | 603.97 | 2.27 |
| 1396 | 601.08 | 2396 | 602.72 | 1.65 | 4396 | 604.73 | 2.01 |
| 1397 | 601.72 | 2397 | 603.40 | 1.68 | 4397 | 605.41 | 2.01 |
| 1398 | 602.82 | 2398 | 604.46 | 1.65 | 4398 | 606.59 | 2.13 |
| 1399 | 603.92 | 2399 | 605.55 | 1.63 | 4399 | 607.87 | 2.32 |
| 1400 | 604.67 | 2400 | 606.27 | 1.60 | 4400 | 608.62 | 2.35 |
| 1401 | 605.76 | 2401 | 607.30 | 1.54 | 4401 | 609.37 | 2.07 |
| 1402 | 605.09 | 2402 | 606.62 | 1.53 | 4402 | 608.95 | 2.33 |
| 1403 | 604.21 | 2403 | 605.75 | 1.55 | 4403 | 607.85 | 2.10 |
| 1404 | 603.24 | 2404 | 604.82 | 1.58 | 4404 | 606.99 | 2.17 |
| 1405 | 602.34 | 2405 | 603.90 | 1.56 | 4405 | 605.91 | 2.01 |
| 1406 | 601.32 | 2406 | 602.88 | 1.56 | 4406 | 604.96 | 2.08 |
| 1407 | 600.23 | 2407 | 601.87 | 1.64 | 4407 | 604.01 | 2.15 |
| 1408 | 598.82 | 2408 | 600.46 | 1.63 | 4408 | 602.84 | 2.39 |
| 1409 | 597.03 | 2409 | 598.70 | 1.67 | 4409 | 601.08 | 2.37 |
| 1410 | 594.79 | 2410 | 596.50 | 1.71 | 4410 | 598.74 | 2.25 |
| 1411 | 592.30 | 2411 | 593.97 | 1.67 | 4411 | 596.24 | 2.27 |
| 1412 | 588.13 | 2412 | 589.77 | 1.64 | 4412 | 593.12 | 3.35 |
| 1420 | 585.20 | 2420 | 587.23 | 2.03 | 7001 | 590.12 | 2.89 |
| 1421 | 592.47 | 2421 | 593.98 | 1.51 | 4421 | 595.99 | 2.01 |
| 1422 | 594.75 | 2422 | 596.33 | 1.58 | 4422 | 598.39 | 2.06 |
| 1423 | 597.21 | 2423 | 598.74 | 1.53 | 4423 | 600.80 | 2.06 |
| 1424 | 598.68 | 2424 | 600.24 | 1.57 | 4424 | 602.39 | 2.15 |
| 1425 | 599.74 | 2425 | 601.31 | 1.57 | 4425 | 603.41 | 2.10 |
| 1426 | 600.67 | 2426 | 602.40 | 1.74 | 4426 | 604.55 | 2.14 |
| 1427 | 601.64 | 2427 | 603.23 | 1.59 | 4427 | 605.35 | 2.13 |
| 1428 | 602.71 | 2428 | 604.23 | 1.51 | 4428 | 606.39 | 2.17 |
| 1429 | 603.69 | 2429 | 605.22 | 1.54 | 4429 | 607.50 | 2.27 |
| 1430 | 604.16 | 2430 | 605.84 | 1.68 | 4430 | 608.27 | 2.43 |
| 1431 | 603.44 | 2431 | 605.01 | 1.56 | 4431 | 607.30 | 2.29 |
| 1432 | 602.59 | 2432 | 604.23 | 1.65 | 4432 | 606.24 | 2.01 |

| PT# | EL | PT# | EL | DIFFERENCE | PT# | EL | DIFFERENCE |
|---|---|---|---|---|---|---|---|
| 1433 | 601.70 | 2433 | 603.28 | 1.58 | 4433 | 605.36 | 2.08 |
| 1434 | 600.87 | 2434 | 602.48 | 1.61 | 4434 | 604.49 | 2.01 |
| 1435 | 599.91 | 2435 | 601.58 | 1.67 | 4435 | 603.74 | 2.15 |
| 1436 | 599.15 | 2436 | 600.84 | 1.69 | 4436 | 603.04 | 2.21 |
| 1437 | 598.34 | 2437 | 599.92 | 1.58 | 4437 | 602.25 | 2.33 |
| 1438 | 597.21 | 2438 | 598.82 | 1.61 | 4438 | 601.12 | 2.30 |
| 1439 | 596.35 | 2439 | 597.92 | 1.56 | 4439 | 600.07 | 2.15 |
| 1440 | 595.40 | 2440 | 596.97 | 1.56 | 4440 | 599.02 | 2.05 |
| 1441 | 594.48 | 2441 | 596.01 | 1.53 | 4441 | 598.02 | 2.01 |
| 1442 | 593.54 | 2442 | 595.07 | 1.53 | 4442 | 597.08 | 2.01 |
| 1443 | 592.70 | 2443 | 594.32 | 1.62 | 4443 | 596.53 | 2.21 |
| 1444 | 592.67 | 2444 | 594.32 | 1.65 | 4444 | 596.75 | 2.43 |
| 1446 | 591.54 | 2446 | 593.13 | 1.59 | 4446 | 595.41 | 2.28 |
| 1447 | 592.04 | 2447 | 593.58 | 1.54 | 4447 | 595.84 | 2.26 |
| 1448 | 593.16 | 2448 | 594.68 | 1.52 | 4448 | 596.84 | 2.16 |
| 1449 | 594.08 | 2449 | 595.62 | 1.54 | 4449 | 597.77 | 2.14 |
| 1450 | 595.19 | 2450 | 596.71 | 1.52 | 4450 | 598.84 | 2.14 |
| 1451 | 596.26 | 2451 | 597.77 | 1.51 | 4451 | 599.79 | 2.02 |
| 1452 | 597.40 | 2452 | 598.97 | 1.57 | 4452 | 601.02 | 2.06 |
| 1453 | 598.44 | 2453 | 599.96 | 1.52 | 4453 | 602.11 | 2.15 |
| 1454 | 599.15 | 2454 | 600.68 | 1.53 | 4454 | 602.78 | 2.10 |
| 1455 | 600.00 | 2455 | 601.53 | 1.52 | 6107 | 604.40 | 2.87 |
| 1456 | 601.16 | 2456 | 602.67 | 1.51 | 4456 | 605.05 | 2.38 |
| 1457 | 602.32 | 2457 | 603.97 | 1.65 | 4457 | 606.11 | 2.14 |
| 1458 | 603.49 | 2458 | 605.17 | 1.68 | 4458 | 607.18 | 2.01 |
| 1459 | 604.44 | 2459 | 606.03 | 1.59 | 4459 | 608.11 | 2.08 |
| 1460 | 604.13 | 2460 | 605.69 | 1.56 | 4460 | 608.00 | 2.31 |
| 1461 | 603.16 | 2461 | 604.84 | 1.68 | 4461 | 607.16 | 2.33 |
| 1462 | 602.17 | 2462 | 603.77 | 1.60 | 4462 | 606.11 | 2.35 |
| 1463 | 601.12 | 2463 | 602.63 | 1.51 | 4463 | 604.88 | 2.24 |
| 1464 | 600.16 | 2464 | 601.76 | 1.59 | 4464 | 603.81 | 2.06 |
| 1465 | 599.10 | 2465 | 600.61 | 1.51 | 4465 | 602.72 | 2.12 |
| 1466 | 598.08 | 2466 | 599.60 | 1.52 | 4466 | 601.61 | 2.01 |
| 1467 | 595.84 | 2467 | 597.58 | 1.74 | 4467 | 599.81 | 2.23 |
| 1468 | 593.52 | 2468 | 595.02 | 1.50 | 4468 | 597.34 | 2.31 |
| 1476 | 593.15 | 2476 | 594.90 | 1.75 | 4476 | 597.26 | 2.36 |
| 1477 | 595.77 | 2477 | 597.41 | 1.64 | 4477 | 599.61 | 2.20 |
| 1478 | 597.98 | 2478 | 599.50 | 1.52 | 4478 | 601.54 | 2.05 |
| 1479 | 599.05 | 2479 | 600.73 | 1.68 | 4479 | 602.91 | 2.19 |
| 1480 | 600.14 | 2480 | 601.73 | 1.59 | 4480 | 603.86 | 2.13 |
| 1481 | 601.12 | 2481 | 602.63 | 1.51 | 4481 | 604.76 | 2.13 |
| 1482 | 602.02 | 2482 | 603.59 | 1.58 | 4482 | 605.79 | 2.19 |
| 1483 | 603.14 | 2483 | 604.74 | 1.60 | 4483 | 607.13 | 2.39 |
| 1484 | 604.14 | 2484 | 605.77 | 1.63 | 4484 | 607.89 | 2.12 |
| 1485 | 604.80 | 2485 | 606.45 | 1.65 | 4485 | 608.46 | 2.01 |
| 1486 | 605.06 | 2486 | 606.56 | 1.50 | 4486 | 608.68 | 2.12 |
| 1487 | 604.22 | 2487 | 605.84 | 1.62 | 4487 | 607.95 | 2.12 |
| 1488 | 603.15 | 2488 | 604.67 | 1.52 | 4488 | 606.89 | 2.22 |
| 1489 | 602.00 | 2489 | 603.70 | 1.70 | 4489 | 605.86 | 2.16 |

| PT# | EL | PT# | EL | DIFFERENCE | PT# | EL | DIFFERENCE |
|---|---|---|---|---|---|---|---|
| 1490 | 600.80 | 2490 | 602.30 | 1.50 | 4490 | 604.55 | 2.25 |
| 1491 | 599.68 | 2491 | 601.36 | 1.69 | 4491 | 603.37 | 2.00 |
| 1492 | 598.62 | 2492 | 600.16 | 1.53 | 4492 | 602.18 | 2.02 |
| 1493 | 597.38 | 2493 | 598.96 | 1.59 | 4493 | 601.21 | 2.25 |
| 1494 | 595.76 | 2494 | 597.35 | 1.59 | 4494 | 599.43 | 2.08 |
| 1495 | 593.94 | 2495 | 595.58 | 1.64 | 4495 | 597.81 | 2.23 |
| 1496 | 592.47 | 2496 | 594.11 | 1.64 | 4496 | 596.35 | 2.24 |
| 1497 | 591.48 | 2497 | 593.05 | 1.58 | 4497 | 595.39 | 2.34 |
| 1498 | 590.54 | 2498 | 592.10 | 1.55 | 4498 | 594.51 | 2.42 |
| 1499 | 590.57 | 2499 | 592.18 | 1.62 | 4499 | 594.50 | 2.32 |
| 1502 | 590.06 | 2502 | 591.61 | 1.55 | 4502 | 594.18 | 2.58 |
| 1503 | 590.24 | 2503 | 591.91 | 1.67 | 4503 | 594.32 | 2.41 |
| 1504 | 591.94 | 2504 | 593.54 | 1.60 | 4504 | 595.64 | 2.09 |
| 1505 | 593.56 | 2505 | 595.13 | 1.57 | 4505 | 597.56 | 2.43 |
| 1506 | 595.24 | 2506 | 596.81 | 1.58 | 4506 | 599.13 | 2.32 |
| 1507 | 596.89 | 2507 | 598.44 | 1.55 | 4507 | 600.75 | 2.32 |
| 1508 | 598.35 | 2508 | 599.87 | 1.52 | 4508 | 602.05 | 2.18 |
| 1509 | 599.37 | 2509 | 600.87 | 1.51 | 4509 | 603.01 | 2.14 |
| 1510 | 600.52 | 2510 | 602.12 | 1.60 | 4510 | 604.25 | 2.12 |
| 1511 | 601.60 | 2511 | 603.16 | 1.56 | 4511 | 605.44 | 2.28 |
| 1512 | 602.78 | 2512 | 604.50 | 1.72 | 4512 | 606.67 | 2.17 |
| 1513 | 603.98 | 2513 | 605.49 | 1.51 | 4513 | 607.75 | 2.26 |
| 1514 | 604.78 | 2514 | 606.44 | 1.66 | 4514 | 608.59 | 2.15 |
| 1515 | 605.60 | 2515 | 607.26 | 1.66 | 4515 | 609.41 | 2.15 |
| 1516 | 605.52 | 2516 | 607.15 | 1.63 | 4516 | 609.29 | 2.14 |
| 1517 | 604.80 | 2517 | 606.40 | 1.59 | 4517 | 608.63 | 2.23 |
| 1518 | 604.11 | 2518 | 605.63 | 1.51 | 4518 | 607.86 | 2.24 |
| 1519 | 603.15 | 2519 | 604.77 | 1.62 | 4519 | 607.01 | 2.24 |
| 1520 | 602.11 | 2520 | 603.74 | 1.63 | 4520 | 606.00 | 2.25 |
| 1521 | 601.16 | 2521 | 602.80 | 1.64 | 4521 | 605.08 | 2.27 |
| 1522 | 600.10 | 2522 | 601.71 | 1.61 | 4522 | 604.08 | 2.37 |
| 1523 | 599.07 | 2523 | 600.69 | 1.62 | 4523 | 602.84 | 2.16 |
| 1524 | 598.08 | 2524 | 599.61 | 1.53 | 4524 | 601.64 | 2.03 |
| 1525 | 595.72 | 2525 | 597.33 | 1.61 | 4525 | 599.93 | 2.60 |
| 1530 | 606.32 | 2530 | 607.98 | 1.67 | 4530 | 609.98 | 2.00 |
| 1531 | 598.07 | 2531 | 599.57 | 1.50 | 4531 | 601.79 | 2.22 |
| 1532 | 599.05 | 2532 | 600.64 | 1.59 | 4532 | 602.93 | 2.29 |
| 1533 | 600.07 | 2533 | 601.64 | 1.57 | 4533 | 603.97 | 2.33 |
| 1534 | 601.08 | 2534 | 602.67 | 1.59 | 4534 | 604.74 | 2.07 |
| 1535 | 602.10 | 2535 | 603.64 | 1.54 | 4535 | 605.93 | 2.29 |
| 1536 | 603.11 | 2536 | 604.66 | 1.54 | 4536 | 606.74 | 2.08 |
| 1537 | 604.04 | 2537 | 605.63 | 1.59 | 4537 | 607.74 | 2.11 |
| 1538 | 604.77 | 2538 | 606.37 | 1.60 | 4538 | 608.37 | 2.00 |
| 1539 | 605.51 | 2539 | 607.10 | 1.59 | 4539 | 609.31 | 2.21 |
| 1540 | 606.13 | 2540 | 607.78 | 1.64 | 4540 | 609.92 | 2.14 |
| 1541 | 606.19 | 2541 | 607.87 | 1.69 | 4541 | 609.89 | 2.01 |
| 1542 | 605.40 | 2542 | 607.01 | 1.61 | 4542 | 609.02 | 2.02 |
| 1543 | 604.57 | 2543 | 606.09 | 1.51 | 4543 | 608.13 | 2.05 |
| 1544 | 603.58 | 2544 | 605.09 | 1.51 | 4544 | 607.27 | 2.18 |

| PT# | EL | PT# | EL | DIFFERENCE | PT# | EL | DIFFERENCE |
|---|---|---|---|---|---|---|---|
| 1545 | 602.45 | 2545 | 604.07 | 1.62 | 4545 | 606.19 | 2.11 |
| 1546 | 601.30 | 2546 | 602.80 | 1.50 | 4546 | 604.82 | 2.02 |
| 1547 | 600.11 | 2547 | 601.80 | 1.69 | 4547 | 603.82 | 2.02 |
| 1548 | 599.04 | 2548 | 600.67 | 1.62 | 4548 | 602.67 | 2.00 |
| 1549 | 598.04 | 2549 | 599.56 | 1.52 | 4549 | 601.56 | 2.00 |
| 1550 | 596.42 | 2550 | 597.96 | 1.54 | 4550 | 599.96 | 2.00 |
| 1551 | 594.74 | 2551 | 596.26 | 1.52 | 4551 | 598.30 | 2.04 |
| 1552 | 593.11 | 2552 | 594.78 | 1.67 | 4552 | 596.86 | 2.08 |
| 1553 | 592.64 | 2553 | 594.17 | 1.53 | 4553 | 596.18 | 2.01 |
| 1554 | 592.67 | 2554 | 594.22 | 1.56 | 4554 | 596.49 | 2.27 |
| 1558 | 594.06 | 2558 | 595.56 | 1.50 | | | |
| 1559 | 594.04 | 2559 | 595.68 | 1.64 | | | |
| 1560 | 595.76 | 2560 | 597.30 | 1.54 | | | |
| 1561 | 597.43 | 2561 | 598.94 | 1.50 | | | |
| 1562 | 598.68 | 2562 | 600.19 | 1.51 | | | |
| 1563 | 599.74 | 2563 | 601.36 | 1.62 | | | |
| 1564 | 600.92 | 2564 | 602.43 | 1.51 | | | |
| 1565 | 602.05 | 2565 | 603.55 | 1.50 | | | |
| 1566 | 603.22 | 2566 | 604.75 | 1.53 | | | |
| 1567 | 604.34 | 2567 | 605.92 | 1.58 | | | |
| 1568 | 605.13 | 2568 | 606.81 | 1.67 | | | |
| 1569 | 605.89 | 2569 | 607.40 | 1.51 | | | |
| 1570 | 606.71 | 2570 | 608.21 | 1.50 | | | |
| 1571 | 606.60 | 2571 | 608.11 | 1.50 | | | |
| 1572 | 606.13 | 2572 | 607.65 | 1.52 | | | |
| 1573 | 605.35 | 2573 | 606.89 | 1.54 | | | |
| 1574 | 604.51 | 2574 | 606.19 | 1.68 | | | |
| 1575 | 604.10 | 2575 | 605.60 | 1.50 | | | |
| 1576 | 603.10 | 2576 | 604.74 | 1.65 | | | |
| 1577 | 602.09 | 2577 | 603.59 | 1.50 | | | |
| 1578 | 601.15 | 2578 | 602.82 | 1.67 | | | |
| 1579 | 600.10 | 2579 | 601.64 | 1.54 | | | |
| 1581 | 606.38 | 2581 | 607.97 | 1.59 | | | |
| 1603 | 593.24 | 2603 | 594.85 | 1.60 | 4603 | 597.29 | 2.44 |
| 1604 | 598.08 | 2604 | 599.61 | 1.53 | 4604 | 601.86 | 2.25 |
| 1608 | 588.73 | 2608 | 590.37 | 1.64 | 4608 | 593.06 | 2.69 |
| 1609 | 589.27 | 2609 | 590.77 | 1.50 | 4609 | 593.67 | 2.90 |
| 1610 | 606.40 | 2610 | 607.91 | 1.51 | 4610 | 609.93 | 2.02 |
| 1633 | 608.83 | 2633 | 610.55 | 1.72 | 4633 | 612.55 | 2.00 |
| 1634 | 606.86 | 2634 | 608.66 | 1.81 | 4634 | 610.81 | 2.14 |
| 1635 | 604.86 | 2635 | 606.58 | 1.72 | 4635 | 608.69 | 2.11 |
| 1636 | 602.91 | 2636 | 604.42 | 1.50 | 4636 | 606.69 | 2.27 |
| 1637 | 600.81 | 2637 | 602.32 | 1.52 | 4637 | 605.03 | 2.70 |
| 1638 | 598.12 | 2638 | 599.66 | 1.54 | | | |
| 1639 | 598.52 | 2639 | 600.22 | 1.70 | 4639 | 602.41 | 2.19 |
| 1640 | 599.03 | 2640 | 600.79 | 1.76 | 4640 | 603.03 | 2.24 |
| 1641 | 599.62 | 2641 | 601.30 | 1.68 | 4641 | 603.36 | 2.06 |
| 1647 | 600.25 | 2647 | 601.78 | 1.53 | 4647 | 603.78 | 2.00 |
| 1648 | 600.80 | 2648 | 602.33 | 1.53 | 4648 | 604.61 | 2.28 |

| PT# | EL | PT# | EL | DIFFERENCE | PT# | EL | DIFFERENCE |
|---|---|---|---|---|---|---|---|
| 1649 | 601.05 | 2649 | 602.76 | 1.71 | 4649 | 605.37 | 2.61 |
| 1651 | 602.80 | 2651 | 604.40 | 1.60 | 4651 | 606.46 | 2.06 |
| 1652 | 592.02 | 2652 | 593.79 | 1.77 | 4652 | 596.40 | 2.62 |
| 1654 | 604.07 | 2654 | 605.62 | 1.56 | 4654 | 607.87 | 2.24 |
| 1655 | 586.00 | 2655 | 588.22 | 2.22 | 4655 | 591.93 | 3.71 |
| 1656 | 605.87 | 2656 | 607.38 | 1.51 | 4656 | 609.47 | 2.09 |
| 1657 | 604.83 | 2657 | 606.34 | 1.51 | 4657 | 608.34 | 2.00 |
| 1658 | 605.33 | 2658 | 606.94 | 1.62 | 4658 | 608.94 | 2.00 |
| 1659 | 599.93 | 2659 | 601.44 | 1.51 | | | |
| 1806 | 596.60 | 2806 | 598.12 | 1.52 | 4806 | 600.53 | 2.41 |
| 1809 | 598.89 | 2809 | 600.58 | 1.69 | 4646 | 602.98 | 2.40 |
| 1811 | 595.96 | 2811 | 597.95 | 1.99 | 4811 | 600.61 | 2.66 |
| 1812 | 599.54 | 2812 | 601.20 | 1.66 | 4812 | 603.56 | 2.36 |
| 1813 | 600.82 | 2813 | 602.61 | 1.79 | 4813 | 605.12 | 2.51 |
| 1814 | 602.10 | 2814 | 603.71 | 1.62 | 4814 | 606.36 | 2.65 |
| 1815 | 602.96 | 2815 | 604.74 | 1.78 | 4815 | 607.18 | 2.44 |
| 1816 | 604.26 | 2816 | 605.84 | 1.57 | 4816 | 608.37 | 2.53 |
| 1817 | 605.29 | 2817 | 606.81 | 1.52 | 4817 | 609.57 | 2.76 |
| 1818 | 606.08 | 2818 | 607.60 | 1.52 | 4818 | 610.15 | 2.56 |
| 1819 | 607.03 | 2819 | 608.57 | 1.54 | 4819 | 610.97 | 2.40 |
| 1820 | 607.99 | 2820 | 609.52 | 1.52 | 4820 | 611.93 | 2.41 |
| 1821 | 608.92 | 2821 | 610.44 | 1.52 | 4821 | 612.87 | 2.42 |
| 1822 | 609.64 | 2822 | 611.22 | 1.58 | 4822 | 613.55 | 2.33 |
| 1823 | 609.59 | 2823 | 611.20 | 1.61 | 4823 | 613.58 | 2.38 |
| 1824 | 608.65 | 2824 | 610.30 | 1.65 | 4824 | 612.83 | 2.53 |
| 1825 | 607.95 | 2825 | 609.51 | 1.56 | 4825 | 611.83 | 2.32 |
| 1826 | 606.99 | 2826 | 608.60 | 1.61 | 4826 | 610.89 | 2.29 |
| 1827 | 606.05 | 2827 | 607.56 | 1.51 | 4827 | 609.59 | 2.03 |
| 1828 | 605.06 | 2828 | 606.60 | 1.54 | 4828 | 608.60 | 2.00 |
| 1829 | 603.86 | 2829 | 605.41 | 1.55 | 4829 | 607.44 | 2.02 |
| 1830 | 602.87 | 2830 | 604.39 | 1.52 | 4830 | 606.48 | 2.08 |
| 1831 | 601.85 | 2831 | 603.39 | 1.53 | 4831 | 605.54 | 2.15 |
| 1832 | 600.83 | 2832 | 602.34 | 1.52 | 4832 | 604.72 | 2.37 |
| 1833 | 599.47 | 2833 | 601.14 | 1.67 | 4833 | 603.62 | 2.48 |
| 1834 | 598.37 | 2834 | 599.87 | 1.50 | 4834 | 602.22 | 2.35 |
| 1835 | 597.44 | 2835 | 598.96 | 1.52 | 4835 | 600.96 | 2.00 |
| 1836 | 596.29 | 2836 | 597.81 | 1.51 | 4836 | 600.01 | 2.20 |
| 2000 | 583.99 | 5000 | 585.55 | 1.56 | 7000 | 590.05 | 4.50 |
| 2001 | 583.97 | 5001 | 585.51 | 1.54 | 7002 | 589.99 | 4.48 |
| 2002 | 583.97 | 5002 | 585.87 | 1.90 | 7003 | 590.98 | 5.11 |
| 2003 | 583.96 | 5003 | 585.54 | 1.58 | 7004 | 589.83 | 4.29 |
| 2004 | 583.99 | 5004 | 585.51 | 1.52 | 7005 | 589.06 | 3.55 |
| 11005.00 | 588.00 | 21005.00 | 589.54 | 1.54 | 7009 | 594.03 | 4.49 |
| 11006.00 | 588.02 | 21006.00 | 589.55 | 1.53 | 7008 | 593.72 | 4.17 |
| 11007.00 | 588.03 | 21007.00 | 589.54 | 1.50 | 7007 | 594.17 | 4.63 |
| 11008.00 | 588.01 | 21008.00 | 589.56 | 1.55 | 7006 | 594.15 | 4.59 |
| 16198 | 608.92 | 26198 | 610.50 | 1.58 | 4327 | 613.89 | 3.39 |

Grid line
xxx.xx Working Surface (typical) | xxxx Clay Grade (typical)
xxx.xx Sub grade (typical)

NORTH CAROLINA PROFESSIONAL SEAL L-2900 LAND SURVEYOR T. DONALD LAWRENCE
8/12/08

GRAPHIC SCALE
40 0 20 40 80 160
( IN FEET )
1 inch = 40 ft.

FDL& assoc

Grade Verification Survey of
**CMS Cell 2-G**
Cabarrus County, Concord N.C.
Orig. scale 1"=40' Date: 7/07/08
Surveyed by: Lawrence Associates, P.A.
106 W. Jefferson St. P.O. Box 1014
Monroe, North Carolina 28112 (704) 289-1013

Drawn By: MCM
REVISIONS
07/10/08 MCM
8/12/08 MCM

Job No. 0135 Drawing file 2GVerified.dwg Drawing no.08/92

of NORTH CAROLINA, PLLC

# APPENDIX A

## Project Modification - Geocomposite

309 East Morehead Street, Suite 160
Charlotte, North Carolina 28202

Tel: (704) 358-7204
Fax: (704) 358-7205

July 24, 2008

BROWN AND CALDWELL

Mr. John Murray, P.E.
NCDENR - Division of Waste Management
Solid Waste Section - Permitting Branch
Mooresville Regional Office
610 East Center Ave.
Mooresville, NC 28115
John.Murray@ncmail.net

134961

Subject: Charlotte Motor Speedway V MSW Landfill –
Cell 2G Construction (Permit Number 13-04)
Approval of the Alteration of the Hydraulic Transmissivity for the Alternate Bottom Liner System Drainage Geocomposite

Dear Mr. Murray:

On July 11, 2008 at 10:00 a.m. a meeting was conducted at the Charlotte Motor Speedway (CMS) Solid Waste Management Facility's office building to discuss the alteration from the specified hydraulic transmissivity for the CMS Landfill's Cell 2G construction drainage geocomposite. Attendees of the meeting included John Murray with North Carolina Department of Environment and Natural Resources (NCDENR), Mike Gurley with Allied Waste Industries, Inc., Albert Glenn with Brown and Caldwell, and Richard Deason with Atlantic Coast Consulting, Inc. Information demonstrating the regulatory acceptability of the drainage geocomposite hydraulic transmissivity alteration was presented to and discussed with Mr. Murray at the meeting. The final outcome of the meeting was the approval of the alteration in the drainage geocomposite hydraulic transmissivity and authorization to continue construction of Cell 2G by Mr. Murray. We were also directed to include the alteration demonstration information in the certification report for Cell 2G construction quality assurance. This letter and its attachments serve as the demonstration for the hydraulic transmissivity alteration. An overview of the alteration demonstration information presented at the meeting is as follows.

The NCDENR approved permit to construct application for Cell 2G specified a geocomposite with a hydraulic transmissivity of $5x10^{-4}$ $m^2$/sec at a hydraulic gradient of 0.25 and normal stress of 10,000 psf (see Attachment 1 – Table 3.5-1 Required Material Properties Geosynthetic Drainage Composite). As part of the construction quality assurance for Cell 2G the drainage geocomposite was laboratory tested to determine the actual field hydraulic transmissivity using a hydraulic gradient of 0.25, normal stress of 10,000 psf, and a seating time of 24-hours. Soil material to be used for the Cell 2G alternate bottom liner system protective cover was used in the laboratory test along with the 60 mil bottom liner system HDPE geomembrane. Three (3) separate laboratory tests of the drainage geocomposite resulted in a lowest hydraulic transmissivity of $2.33x10^{-4}$ $m^2$/sec. The laboratory test results for the drainage geocomposite and protective cover soil are included in Attachment No. 1.

To demonstrate that the lowest laboratory test result for the drainage geocomposite meets the requirements set forth in Solid Waste Management Rules 15 NCAC 13B .1624.b.2, US EPA's Hydrological Evaluation of Landfill Performance (HELP) model version 3.07 was used. The HELP model was used to demonstrate that the laboratory test hydraulic transmissivity of $2.33 \times 10^{-4}$ $m^2$/sec (hydraulic conductivity of 4.828 cm/sec) will provide the necessary transmissivity to maintain less than one (1) foot of head on top of the landfill alternate bottom liner system geomembrane. The alteration demonstration HELP model inputs included similar weather, soil, and design data from the NCDENR approved permit to construct application HELP model. Other than the drainage geocomposite hydraulic transmissivity, the only difference in the HELP model inputs was the hydraulic conductivity for the protective soil cover which was $6.6 \times 10^{-4}$ cm/sec. This hydraulic conductivity was the result of laboratory testing of the soil that will be used for the Cell 2G bottom liner system protective cover. The protective cover soil laboratory test result is included in Attachment No. 1.

The HELP model outputs for the alteration demonstration are included in Attachment 2. A summary of the HELP model alteration demonstration results are in the following Table 1-1:

Table 1-1. Summary of HELP Model Results for Typical One Acre Cell (Drainage Geocomposite with Hydraulic Transmissivity of $2.33 \times 10^{-4}$ $m^2$/sec)

| Evaluation Parameters | Lowest Laboratory Tested Geocomposite Hydraulic Transmissivity Result Note 1, 2 & 3 (Hydraulic Conductivity Note 4) | Average Annual Head on Geomembrane | Peak Daily Average Head on Geomembrane | Peak Daily Maximum Head on Geomembrane |
|---|---|---|---|---|
| 5 feet of Waste | $2.33 \times 10^{-4}$ $m^2$/sec (4.828 cm/sec) | 0.013 inches | 0.174 inches | 0.339 inches |
| 70 feet of Waste with Intermediate Cover | $2.33 \times 10^{-4}$ $m^2$/sec (4.828 cm/sec) | 0.012 inches | 0.076 inches | 0.149 inches |
| 130 feet of Waste with Intermediate Cover | $2.33 \times 10^{-4}$ $m^2$/sec (4.828 cm/sec) | 0.012 inches | 0.073 inches | 0.144 inches |

Notes

1. The hydraulic transmissivity laboratory testing results for the drainage geocomposite are $2.72 \times 10^{-4}$ $m^2$/sec, $2.61 \times 10^{-4}$ $m^2$/sec, and $2.33 \times 10^{-4}$ $m^2$/sec.
2. Laboratory tested with 2 feet of protective soil cover, Agru double sided drainage geocomposite, and 60 mil HDPE geomembrane.
3. Tested with a normal load of 10,000 psf and hydraulic gradient of 0.25.
4. Based on a drainage geocomposite hydraulic transmissivity of $2.33 \times 10^{-4}$ $m^2$/sec and thickness of 0.4826 cm.

As shown in Table 1-1, the HELP model outputs using the lowest laboratory testing result for the drainage geocomposite and protective cover soil meets the requirement set forth in the Solid Waste Management Rule 15 NCAC 13B .1624.b.2 of maintaining less than one (1) foot of hydraulic head on top of the bottom liner system geomembrane.

If you have any questions, or need additional information, please don't hesitate to contact me at (704) 373-7127 or Mike Gurley with Allied Waste at (704) 782-2004 ext 391.

Sincerely,

BROWN AND CALDWELL

Albert D. Glenn, P.E.
Senior Engineer

Attachments: 1 and 2
Cc: Mike Gurley - Allied Waste Industries, Inc.
Richard Deason - Atlantic Coast Consulting, Inc.
Cell 2G Construction Quality Assurance Certification Report
File

# ATTACHMENT 1

**TABLE 3.5-1**

**REQUIRED MATERIAL PROPERTIES**
**GEOSYNTHETIC DRAINAGE COMPOSITE**

| Material Property | Value | Units | Test Method | Test Frequencies |
|---|---|---|---|---|
| Geonet Density | $\geq$0.940(1) | gm/cm³ | ASTM D1505 | 1 per 100,000 ft² |
| Geonet Thickness | $\geq$0.25 | inches | ASTM D5199 | 1 per 100,000 ft² |
| Geonet Mass per Unit Area | $\geq$0.16 | lbs/ft² | ASTM D3776 | 1 per 100,000 ft² |
| Geonet Carbon Black Content | 2-3 | percent | ASTM D1603 | 1 per 100,000 ft² |
| Geonet Tensile Strength at Break | $\geq$55 | lbs/in | ASTM D5035 | 1 per 100,000 ft² |
| Drainage Composite Transmissivity @ 10,000 psf(2) | $\geq 5 \times 10^{-4}$ | m²/sec | ASTM D4716 | 1 per 200,000 ft² |
| Drainage Composite Ply Adhesion | $\geq$150 | g/in | ASTM F904 | 1 per 200,000 ft² |

**Notes:**

(1) Must be less than or equal to the specific density of the geomembrane.
(2) Transmissivity will be measured in the laboratory using water at 20°C with a gradient of 0.25, between the materials specified in the permit (i.e., 60-mil HDPE geomembrane and Protective Cover material), and will be tested after a seating period of 24 hours (minimum).
(3) Geotextile to meet properties of Table 3.6-1, 10 oz/sy for the base liner drainage composite and 6 oz/sy for the enhanced liner system and cap drainage composite.

TIMELY ENGINEERING SOIL TESTS, LLC
1874 Forge Street Tucker, GA 30084
Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

| | |
|---|---|
| Tested By | KI |
| Date | 06/11/08 |
| Checked By | |

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bulk |
| Sample ID | 5238/BC-1 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

## ASTM D 698
## Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft$^3$ (600kN-m/m$^3$))

### DETERMINATION OF TEST PROCEDURE

| | wet | dry |
|---|---|---|
| Mass of Soil before sieving, g | 26300.0 | 23778.1 |
| Mass of Mat. Retained on No. 4 sieve, g | 0.0 | 0.0 |
| Mass of Mat. Retained on 3/8" sieve, g | 92.5 | 92.5 |
| Mass of Mat. Retained on 3/4" sieve, g | 0.0 | 0.0 |

| | |
|---|---|
| Material Retained on No. 4 Sieve, % | 0.0 |
| Material Retained on 3/8" Sieve, % | 0.4 |
| Material Retained on 3/4" Sieve, % | 0.0 |
| Total, % (oversized) | 0.4 |

*MOISTURE CONTENT*

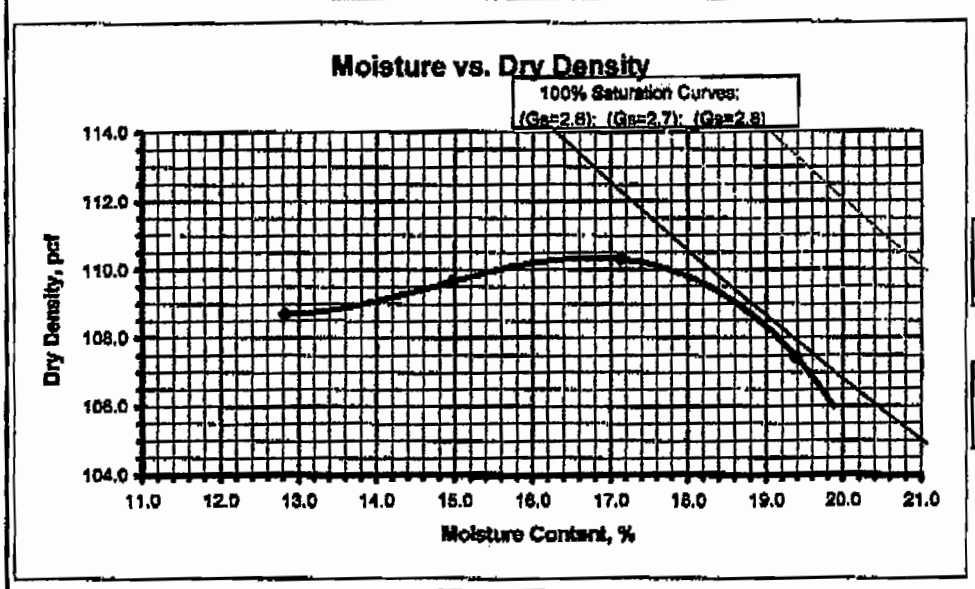
| | Coarse + Fine Fraction | Coarse Fraction |
|---|---|---|
| Mass of Wet Sample & Tare, g | 1037.5 | 92.5 |
| Mass of Dry Sample & Tare, g | 953.5 | 92.5 |
| Mass of Tare, g | 161.5 | 0.0 |
| Moisture Content, % | 10.6 | 0.0 |

Procedure: B

### TEST DATA

| Points | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Mass of Mold and Soil, g | 5800.0 | 5852.0 | 5899.0 | 5885.0 | |
| Mass of Wet Sample & Tare, g | 512.0 | 511.0 | 515.0 | 512.5 | |
| Mass of Dry Sample & Tare, g | 464.5 | 458.0 | 455.5 | 444.0 | |
| Mass of Tare, g | 94.0 | 104.0 | 108.0 | 90.5 | |
| Moisture Content, % | 12.8 | 15.0 | 17.1 | 19.4 | |
| Wet Density, pcf | 122.6 | 126.1 | 129.2 | 128.3 | |
| Dry Density, pcf | 108.7 | 109.7 | 110.3 | 107.4 | |

| | |
|---|---|
| Mold ID Number | 18 |
| Mass of Mold, g | 3947.5 |
| Volume of Mold, ft$^3$ | 0.0333 |
| Hammer ID Number | 20 |
| Number of Blows per layer | 25 |
| Number of Layers | 3 |




Method A: Material retained on No. 4 ≤ 20%
Method B: Material retained on No. 4 > 20% and material retained on 3/8" ≤ 20%
Method C: Material retained on 3/8" > 20% and material retained on 3/4" < 30%

REMARKS

DESCRIPTION
NA

USCS (ASTM D2487; D2488)
NA

| | |
|---|---|
| Maximum Dry Density, pcf | 110.3 |
| Optimum Moisture Content, % | 16.8 |

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1874 Forge Street Tucker, GA 30084
Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

| | |
|---|---|
| Tested By | RI |
| Date | 06/12/08 |
| Checked By | KB |

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bulk |
| Sample ID | 5238/BC-1 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

## ASTM D 5084; Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter (Method D, Constant Rate of Flow)

### Initial Sample Data (Before Test)

| | | | | |
|---|---|---|---|---|
| Height | 2.570 | in | 6.53 | cm |
| Diameter | 2.850 | in | 7.24 | cm |
| Area | 6.38 | $in^2$ | 41.16 | $cm^2$ |
| Volume | 268.67 | $cm^3$ | 0.0095 | $ft^3$ |
| Mass | 443.55 | g | 0.98 | lb |
| Specific Gravity | 2.650 | (Assumed) | | |
| Dry Density | 88.5 | pcf | | |

**Moisture Content**

| | | |
|---|---|---|
| Mass of wet sample & tare | 418.60 | g |
| Mass of dry sample & tare | 381.90 | g |
| Mass of tare | 156.20 | g |
| % Moisture | 16.3 | |

### Test Data

| | | |
|---|---|---|
| Speed | 2 | |
| Board Number | 5 | |
| Cell Number | 7 | |
| Flow Pump Number | 2A | |
| Flow Pump Rate | 5.73E-02 | $cm^3$/sec |
| B - Value | 0.96 | |
| Cell Pressure | 90.0 | psi |
| Back Pressure | 80.0 | psi |
| Confining (Effective) Pressure | 10.0 | psi |
| Max Head | 11.96 | cm |
| Min Head | 11.96 | cm |
| Maximum Gradient | 1.85 | |
| Minimum Gradient | 1.85 | |

### Final Data (After Test)

| | | | | |
|---|---|---|---|---|
| Average Height of Sample | | 2.550 in | 6.48 | cm |
| Average Diameter of Sample | | 2.835 in | 7.20 | cm |
| Area | 6.31 $in^2$ | 40.73 $cm^2$ | | |
| Volume | 263.76 $cm^3$ | 0.0093 $ft^3$ | | |
| Mass | 491.50 g | 1.08 lb | | |

| | | |
|---|---|---|
| Dry Density | 88.7 | pcf |
| Vol. of Voids | 122.31 | $cm^3$ |
| Vol. of Solids | 141.47 | $cm^3$ |
| Void Ratio | 0.86 | |
| Saturation | 95.3 | % |

**Moisture Content**

| | | |
|---|---|---|
| Mass of wet sample & tare | 576.80 | g |
| Mass of dry sample & tare | 460.20 | g |
| Mass of tare | 85.30 | g |
| % Moisture | 31.1 | |

| TIME FUNCTION | | | Δt | READING | Head | Gradient | Temp. | PERMEABILITY (cm/sec) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE | HOUR | MIN | (sec) | (psi) | (cm) | | $T_x$(°C) | @ $T_x$ | $R_T$ | @ 20 °C | |
| 06/12/08 | 14 | 30 | - | 0.17 | 11.96 | 1.85 | 26.0 | - | - | - | |
| 06/12/08 | 14 | 31 | 60 | 0.17 | 11.96 | 1.85 | 26.0 | 7.63E-04 | 0.869 | 6.63E-04 | |
| 06/12/08 | 14 | 32 | 60 | 0.17 | 11.96 | 1.85 | 26.0 | 7.63E-04 | 0.869 | 6.63E-04 | |
| 06/12/08 | 14 | 33 | 60 | 0.17 | 11.96 | 1.85 | 26.0 | 7.63E-04 | 0.869 | 6.63E-04 | * |
| 06/12/08 | 14 | 34 | 60 | 0.17 | 11.96 | 1.85 | 26.0 | 7.63E-04 | 0.869 | 6.63E-04 | * |
| 06/12/08 | 14 | 35 | 60 | 0.17 | 11.96 | 1.85 | 26.0 | 7.63E-04 | 0.869 | 6.63E-04 | * |
| 06/12/08 | 14 | 36 | 60 | 0.17 | 11.96 | 1.85 | 26.0 | 7.63E-04 | 0.869 | 6.63E-04 | * |

Reported Average Hydraulic Conductivity* 6.6E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed #4 sieve used for testing. Material was remolded to 80.3% of maximum dry density (standard proctor) at 0.5% below optimum moisture content.

| | | | | | |
|---|---|---|---|---|---|
| Flow pump ID # | 244 | Balance ID # | 1/8/7 | Differential Pressure Transducer ID # | 262 |
| Thermometer ID # | 63 | Oven ID # | 14/15 | Board Pressure Transducer ID # | 216 |
| Syringe ID # | 245 | | | Pore Pressure Transducer ID # | 28 |

**TRI / Environmental, Inc.**
*A Texas Research International Company*

July 3, 2008
July 5, 2008 (Revised)

**Mail To:**

**Mr. Scott Callaway**
**Atlantic Coast Consulting, Inc. (ACC)**
630 Colonial Park Drive, Suite 110
Roswell, GA 30075

email: scallaway@atlcc.net

**Bill To:**

**<= Same**

Dear Mr. Callaway:

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: | **Charlotte Motor Speedway** |
| TRI Job Reference Number: | E2312-47-07 |
| Material(s) Tested: | 2 Agru Double Sided Geocomposite(s) |
| Test(s) Requested: | Transmissivity (ASTM D 4716) - GC<br>Peel Strength (ASTM F 904) - GC |

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

TRI / Environmental, Inc.
*A Texas Research International Company*

# GEOCOMPOSITE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Agru Double Sided Geocomposite**
**Sample Identification: 526273.08**
**TRI Log #: E2312-47-07**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydraulic Transmissivity (ASTM D 4716)** | | | | | | | | | | | | | |

Direction Tested: Machine Direction

| | |
|---|---|
| Normal Load (psf): | 10,000 |
| Hydraulic Gradient: | 0.25 |
| Test Length (in) | 12 |
| Test Width (in) | 12 |

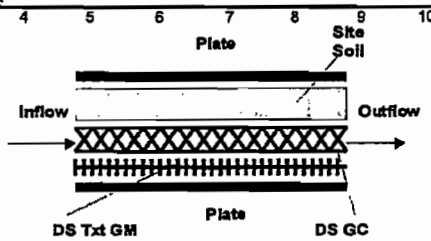


Plate / Site Soil / Sample / Agru 60 mil Microspike Geomembrane / Plate

| Seat Time (hours) | | Specimen | 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume (cc) | | 622 | 616 | 628 | | | | | | | | |
| | Time (s) | | 30.06 | 29.84 | 30.25 | | | | | | | | |
| 24 | Flow Rate (GPM/ft width) | | 0.33 | 0.33 | 0.33 | | | | | | 0.33 | 0.00 | |
| | Transmissivity (m^2/s) | | 2.72E-04 | 2.71E-04 | 2.72E-04 | | | | | | 2.72E-04 | 7.71E-07 | 5.0E-4 min |
| | Test Temp (C) | | | 20.0 | | | | | | | | | |
| | Temp. Corr. Factor | | | 1.000 | | | | | | | | | |
| **Peel Strength (ASTM F 904, mod.)** | | | | | | | | | | | | | |
| A - MD Average Peel Strength (ppi) | | 0.7 | 4.4 | 4.5 | 2.2 | 2.5 | | | | | 2.9 | 1.6 | |
| A - MD Average Peel Strength (g/in) | | 318 | 1998 | 2043 | 999 | 1135 | | | | | 1298 | 728 | 150 min |
| B - MD Average Peel Strength (ppi) | | 6.7 | 1.2 | 3.5 | 5.3 | 1.9 | | | | | 3.7 | 2.3 | |
| B - MD Average Peel Strength (g/in) | | 3042 | 545 | 1589 | 2406 | 863 | | | | | 1689 | 1042 | 150 min |

Note: A and B represent a randomly assigned top and bottom of the sample

MD Machine Direction TD Transverse Direction

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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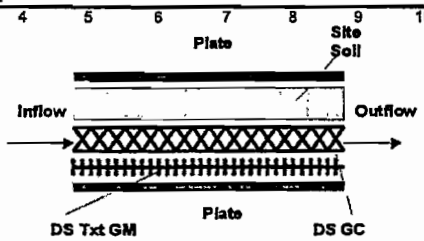
# GEOCOMPOSITE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Agru Double Sided Geocomposite**
**Sample Identification: 526457.08**
**TRI Log #: E2312-47-07**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydraulic Transmissivity (ASTM D 4716)** | | | | | | | | | | | | | |
| Direction Tested: Machine Direction | | | | | | | | | | | | | |
| Normal Load (psf): | 10,000 | | | | | | | | | | | | |
| Hydraulic Gradient: | 0.25 | | | | | | | | | | | | |
| Test Length (in) | 12 | | | | | | | | | | | | |
| Test Width (in) | 12 | | | | | | | | | | | | |
| Plate / Site Soil / Sample / Agru 60 mil Microspike Geomembrane / Plate | | | | | | | | | | | | | |
| Seat Time (hours) | Specimen | | 1 | | | | | | | | | | |
| Volume (cc) | | 597 | 603 | 605 | | | | | | | | | |
| Time (s) | | 30.15 | 30.37 | 30.40 | | | | | | | | | |
| 24 Flow Rate (GPM/ft width) | | 0.31 | 0.31 | 0.32 | | | | | | | 0.31 | 0.00 | |
| 24 Transmissivity (m^2/s) | | 2.60E-04 | 2.61E-04 | 2.61E-04 | | | | | | | 2.61E-04 | 6.59E-07 | 5.0E-4 min |
| Test Temp (C) | | | 20.0 | | | | | | | | | | |
| Temp. Corr. Factor | | | 1.000 | | | | | | | | | | |
| **Peel Strength (ASTM F 904, mod.)** | | | | | | | | | | | | | |
| A - MD Average Peel Strength (ppi) | 4.7 | 3.7 | 3.1 | 1.4 | 4.7 | | | | | | 3.5 | 1.4 | |
| A - MD Average Peel Strength (g/in) | 2134 | 1680 | 1407 | 636 | 2134 | | | | | | 1598 | 621 | 150 min |
| B - MD Average Peel Strength (ppi) | 6.0 | 6.0 | 2.1 | 0.4 | 1.6 | | | | | | 3.2 | 2.6 | |
| B - MD Average Peel Strength (g/in) | 2724 | 2724 | 953 | 182 | 726 | | | | | | 1462 | 1186 | 150 min |




Note: A and B represent a randomly assigned top and bottom of the sample

MD Machine Direction TD Transverse Direction

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.


GeosyntheticTesting.com
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**TRI / Environmental, Inc.**
*A Texas Research International Company*

July 3, 2008

**Mail To:**

**Mr. Scott Callaway**
**Atlantic Coast Consulting, Inc. (ACC)**
630 Colonial Park Drive, Suite 110
Roswell, GA 30075

email: scallaway@atlcc.net

**Bill To:**

**<= Same**

Dear Mr. Callaway:

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: | **Charlotte Motor Speedway** |
| TRI Job Reference Number: | E2312-50-06 |
| Material(s) Tested: | 1 Agru Double Sided Geocomposite(s) |
| Test(s) Requested: | Transmissivity (ASTM D 4716) - GC<br>Peel Strength (ASTM F 904) - GC |

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: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Agru Double Sided Geocomposite**
**Sample Identification: 526537.08**
**TRI Log #: E2312-50-06**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Hydraulic Transmissivity (ASTM D 4716)**

Direction Tested: Machine Direction

| | |
|---|---|
| Normal Load (psf): | 10,000 |
| Hydraulic Gradient: | 0.25 |
| Test Length (in) | 12 |
| Test Width (in) | 12 |

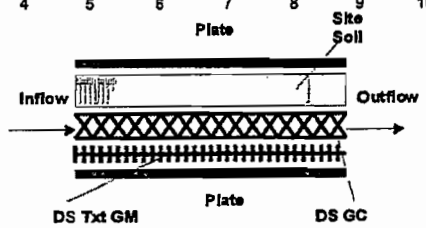


Plate / Site Soil / Sample / Agru 60 mil Microspike Geomembrane / Plate

| Seat Time (hours) | Specimen | 1 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume (cc) | | 538 | 641 | 536 | | | | | | | | |
| | Time (s) | | 30.25 | 36.06 | 30.15 | | | | | | | | |
| 24 | Flow Rate (GPM/ft width) | | 0.28 | 0.28 | 0.28 | | | | | | 0.28 | 0.00 | |
| | Transmissivity (m^2/s) | | 2.33E-04 | 2.33E-04 | 2.33E-04 | | | | | | 2.33E-04 | 6.38E-08 | 5.0E-4 min |
| | Test Temp (C) | | | 20.0 | | | | | | | | | |
| | Temp. Corr. Factor | | | 1.000 | | | | | | | | | |

**Peel Strength (ASTM F 904, mod.)**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A - MD Average Peel Strength (ppi) | 10.1 | 9.5 | 5.9 | 3.1 | 7.0 | | | | | | 7.1 | 2.8 | |
| A - MD Average Peel Strength (g/in) | 4585 | 4313 | 2679 | 1407 | 3178 | | | | | | 3232 | 1288 | 150 min |
| B - MD Average Peel Strength (ppi) | 8.3 | 11.0 | 5.7 | 3.7 | 2.2 | | | | | | 6.2 | 3.5 | |
| B - MD Average Peel Strength (g/in) | 3768 | 4994 | 2588 | 1680 | 999 | | | | | | 2806 | 1604 | 150 min |

Note: A and B represent a randomly assigned top and bottom of the sample

MD Machine Direction TD Transverse Direction

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.


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

# ATTACHMENT 2

CMS LANDFILL V CELL 2G (REVISED)

```
******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\CMSLF\DATA4.D4
TEMPERATURE DATA FILE:       C:\CMSLF\DATA7.D7
SOLAR RADIATION DATA FILE:   C:\CMSLF\DATA13.D13
EVAPOTRANSPIRATION DATA:     C:\CMSLF\DATA11.D11
SOIL AND DESIGN DATA FILE:   C:\CMSLF\5FTALT\DATA10.D10
OUTPUT DATA FILE:            C:\CMSLF\5FTALT\INITIAL.OUT


TIME:  10:44     DATE:   7/24/2008


******************************************************************************

     TITLE:  CMS LANDFILL V CELL 2G - 5 FT. OF WASTE WITH ALTERNATE LINER

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  18
          THICKNESS                    =     60.00   INCHES
          POROSITY                     =      0.6710 VOL/VOL
          FIELD CAPACITY               =      0.2920 VOL/VOL
          WILTING POINT                =      0.0770 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.3077 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.100000005000E-02 CM/SEC
```

CMS LANDFILL V CELL 2G (REVISED)

LAYER 2

---

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 24.00 | INCHES |
| POROSITY | = | 0.4570 | VOL/VOL |
| FIELD CAPACITY | = | 0.1310 | VOL/VOL |
| WILTING POINT | = | 0.0580 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2310 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.660000020000E-03 | CM/SEC |

LAYER 3

---

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.19 | INCHES |
| POROSITY | = | 0.8500 | VOL/VOL |
| FIELD CAPACITY | = | 0.0100 | VOL/VOL |
| WILTING POINT | = | 0.0050 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0337 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 4.82800007000 | CM/SEC |
| SLOPE | = | 2.00 | PERCENT |
| DRAINAGE LENGTH | = | 250.0 | FEET |

LAYER 4

---

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.06 | INCHES |
| POROSITY | = | 0.0000 | VOL/VOL |
| FIELD CAPACITY | = | 0.0000 | VOL/VOL |
| WILTING POINT | = | 0.0000 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0000 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.199999996000E-12 | CM/SEC |
| FML PINHOLE DENSITY | = | 4.00 | HOLES/ACRE |
| FML INSTALLATION DEFECTS | = | 3.00 | HOLES/ACRE |
| FML PLACEMENT QUALITY | = | 3 - GOOD | |

LAYER 5

---

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.25 | INCHES |
| POROSITY | = | 0.7500 | VOL/VOL |
| FIELD CAPACITY | = | 0.7470 | VOL/VOL |
| WILTING POINT | = | 0.4000 | VOL/VOL |

CMS LANDFILL V CELL 2G (REVISED)

| | | | |
|---|---|---|---|
| INITIAL SOIL WATER CONTENT | = | 0.7470 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.499999997000E-08 | CM/SEC |

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 18.00 | INCHES |
| POROSITY | = | 0.4270 | VOL/VOL |
| FIELD CAPACITY | = | 0.4180 | VOL/VOL |
| WILTING POINT | = | 0.3670 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.4270 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.999999975000E-05 | CM/SEC |

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #18 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 250. FEET.

| | | | |
|---|---|---|---|
| SCS RUNOFF CURVE NUMBER | = | 80.00 | |
| FRACTION OF AREA ALLOWING RUNOFF | = | 0.0 | PERCENT |
| AREA PROJECTED ON HORIZONTAL PLANE | = | 1.000 | ACRES |
| EVAPORATIVE ZONE DEPTH | = | 10.0 | INCHES |
| INITIAL WATER IN EVAPORATIVE ZONE | = | 2.079 | INCHES |
| UPPER LIMIT OF EVAPORATIVE STORAGE | = | 6.710 | INCHES |
| LOWER LIMIT OF EVAPORATIVE STORAGE | = | 0.770 | INCHES |
| INITIAL SNOW WATER | = | 0.000 | INCHES |
| INITIAL WATER IN LAYER MATERIALS | = | 31.887 | INCHES |
| TOTAL INITIAL WATER | = | 31.887 | INCHES |
| TOTAL SUBSURFACE INFLOW | = | 0.00 | INCHES/YEAR |

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM CHARLOTTE NORTH CAROLINA

| | | | |
|---|---|---|---|
| STATION LATITUDE | = | 35.20 | DEGREES |
| MAXIMUM LEAF AREA INDEX | = | 0.00 | |
| START OF GROWING SEASON (JULIAN DATE) | = | 83 | |
| END OF GROWING SEASON (JULIAN DATE) | = | 312 | |
| EVAPORATIVE ZONE DEPTH | = | 10.0 | INCHES |
| AVERAGE ANNUAL WIND SPEED | = | 7.50 | MPH |
| AVERAGE 1ST QUARTER RELATIVE HUMIDITY | = | 64.00 | % |
| AVERAGE 2ND QUARTER RELATIVE HUMIDITY | = | 67.00 | % |

CMS LANDFILL V CELL 2G (REVISED)
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 70.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 3.80 | 3.81 | 4.83 | 3.27 | 3.64 | 3.57 |
| 3.92 | 3.75 | 3.59 | 2.72 | 2.86 | 3.40 |

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 40.50 | 42.90 | 50.40 | 60.30 | 68.20 | 75.00 |
| 78.50 | 77.90 | 72.00 | 60.70 | 50.70 | 42.60 |

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA
AND STATION LATITUDE = 35.20 DEGREES

**********

ANNUAL TOTALS FOR YEAR 1

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.37 | 142913.141 | 100.00 |
| RUNOFF | 0.000 | 0.000 | 0.00 |
| EVAPOTRANSPIRATION | 32.029 | 116264.961 | 81.35 |
| DRAINAGE COLLECTED FROM LAYER 3 | 7.3241 | 26586.662 | 18.60 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000004 | 0.015 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 4 | 0.0091 | | |
| PERC./LEAKAGE THROUGH LAYER 6 | 0.000004 | 0.015 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 6 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 0.017 | 61.399 | 0.04 |

| | | | |
|---|---|---|---|
| SOIL WATER AT START OF YEAR | 32.073 | 116426.117 | |
| SOIL WATER AT END OF YEAR | 32.090 | 116487.516 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.097 | 0.00 |

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ANNUAL TOTALS FOR YEAR 2

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.97 | 166871.141 | 100.00 |
| RUNOFF | 0.000 | 0.000 | 0.00 |
| EVAPOTRANSPIRATION | 32.557 | 118181.281 | 70.82 |
| DRAINAGE COLLECTED FROM LAYER 3 | 16.6556 | 60459.812 | 36.23 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.023 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 4 | 0.0210 | | |
| PERC./LEAKAGE THROUGH LAYER 6 | 0.000006 | 0.023 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 6 | 0.0000 | | |
| CHANGE IN WATER STORAGE | -3.242 | -11769.985 | -7.05 |
| SOIL WATER AT START OF YEAR | 32.090 | 116487.516 | |
| SOIL WATER AT END OF YEAR | 28.848 | 104717.531 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.012 | 0.00 |

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ANNUAL TOTALS FOR YEAR 3

CMS LANDFILL V CELL 2G (REVISED)

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.06 | 174457.781 | 100.00 |
| RUNOFF | 0.000 | 0.000 | 0.00 |
| EVAPOTRANSPIRATION | 34.739 | 126102.187 | 72.28 |
| DRAINAGE COLLECTED FROM LAYER 3 | 12.3439 | 44808.191 | 25.68 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000005 | 0.019 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 4 | 0.0158 | | |
| PERC./LEAKAGE THROUGH LAYER 6 | 0.000005 | 0.019 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 6 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 0.977 | 3547.410 | 2.03 |
| SOIL WATER AT START OF YEAR | 28.848 | 104717.531 | |
| SOIL WATER AT END OF YEAR | 29.576 | 107359.594 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.249 | 905.349 | 0.52 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.036 | 0.00 |

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ANNUAL TOTALS FOR YEAR 4

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 36.84 | 133729.203 | 100.00 |
| RUNOFF | 0.000 | 0.000 | 0.00 |
| EVAPOTRANSPIRATION | 30.807 | 111828.711 | 83.62 |
| DRAINAGE COLLECTED FROM LAYER 3 | 4.7355 | 17189.857 | 12.85 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000004 | 0.013 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 4 | 0.0059 | | |
| PERC./LEAKAGE THROUGH LAYER 6 | 0.000004 | 0.013 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 6 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 1.298 | 4710.651 | 3.52 |

| | | | |
|---|---|---|---|
| SOIL WATER AT START OF YEAR | 29.576 | 107359.594 | |
| SOIL WATER AT END OF YEAR | 31.123 | 112975.594 | |
| SNOW WATER AT START OF YEAR | 0.249 | 905.349 | 0.68 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.029 | 0.00 |

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ANNUAL TOTALS FOR YEAR 5

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.76 | 166108.812 | 100.00 |
| RUNOFF | 0.000 | 0.000 | 0.00 |
| EVAPOTRANSPIRATION | 32.941 | 119576.930 | 71.99 |
| DRAINAGE COLLECTED FROM LAYER 3 | 11.3547 | 41217.508 | 24.81 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000005 | 0.018 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 4 | 0.0142 | | |
| PERC./LEAKAGE THROUGH LAYER 6 | 0.000005 | 0.018 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 6 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 1.464 | 5314.378 | 3.20 |
| SOIL WATER AT START OF YEAR | 31.123 | 112975.594 | |
| SOIL WATER AT END OF YEAR | 32.587 | 118289.969 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.025 | 0.00 |

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

CMS LANDFILL V CELL 2G (REVISED)

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| **PRECIPITATION** | | | | | | |
| TOTALS | 3.35 | 3.78 | 5.11 | 2.89 | 3.89 | 4.60 |
| | 3.88 | 3.64 | 3.32 | 3.80 | 1.67 | 3.27 |
| STD. DEVIATIONS | 2.40 | 1.67 | 1.54 | 1.83 | 2.41 | 1.14 |
| | 1.36 | 2.89 | 1.20 | 2.01 | 1.40 | 1.72 |
| **RUNOFF** | | | | | | |
| TOTALS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATIONS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **EVAPOTRANSPIRATION** | | | | | | |
| TOTALS | 1.706 | 2.187 | 3.298 | 3.328 | 3.566 | 3.157 |
| | 4.382 | 2.755 | 2.752 | 2.316 | 1.819 | 1.349 |
| STD. DEVIATIONS | 0.176 | 0.242 | 0.135 | 0.966 | 1.858 | 1.030 |
| | 1.755 | 1.679 | 1.527 | 0.976 | 0.560 | 0.095 |
| **LATERAL DRAINAGE COLLECTED FROM LAYER 3** | | | | | | |
| TOTALS | 1.4175 | 1.4821 | 1.4815 | 1.2912 | 0.7378 | 0.7862 |
| | 0.4262 | 0.3869 | 0.7275 | 0.5876 | 0.7582 | 0.4002 |
| STD. DEVIATIONS | 1.3915 | 1.6474 | 1.0115 | 0.6206 | 0.7900 | 1.1766 |
| | 0.4209 | 0.2812 | 0.8414 | 0.5477 | 0.6242 | 0.1696 |
| **PERCOLATION/LEAKAGE THROUGH LAYER 4** | | | | | | |
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **PERCOLATION/LEAKAGE THROUGH LAYER 6** | | | | | | |
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

CMS LANDFILL V CELL 2G (REVISED)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0209 | 0.0241 | 0.0218 | 0.0197 | 0.0109 | 0.0120 |
| | 0.0063 | 0.0057 | 0.0111 | 0.0087 | 0.0115 | 0.0059 |
| STD. DEVIATIONS | 0.0205 | 0.0269 | 0.0149 | 0.0095 | 0.0116 | 0.0179 |
| | 0.0062 | 0.0041 | 0.0128 | 0.0081 | 0.0095 | 0.0025 |

DAILY AVERAGE HEAD ON TOP OF LAYER 6

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

| | INCHES | | | CU. FEET | PERCENT |
|---|---|---|---|---|---|
| PRECIPITATION | 43.20 | ( | 4.821) | 156816.0 | 100.00 |
| RUNOFF | 0.000 | ( | 0.0000) | 0.00 | 0.000 |
| EVAPOTRANSPIRATION | 32.615 | ( | 1.4348) | 118390.80 | 75.497 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 3 | 10.48276 | ( | 4.61887) | 38052.402 | 24.26564 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.00000 | ( | 0.00000) | 0.018 | 0.00001 |
| AVERAGE HEAD ON TOP OF LAYER 4 | 0.013 | ( | 0.006) | | |
| PERCOLATION/LEAKAGE THROUGH LAYER 6 | 0.00000 | ( | 0.00000) | 0.018 | 0.00001 |
| AVERAGE HEAD ON TOP OF LAYER 6 | 0.000 | ( | 0.000) | | |
| CHANGE IN WATER STORAGE | 0.103 | ( | 1.9521) | 372.77 | 0.238 |

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

| | (INCHES) | (CU. FT.) |
|---|---|---|

CMS LANDFILL V CELL 2G (REVISED)

| | | |
|---|---|---|
| PRECIPITATION | 2.43 | 8820.900 |
| RUNOFF | 0.000 | 0.0000 |
| DRAINAGE COLLECTED FROM LAYER 3 | 0.38015 | 1379.93164 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.000000 | 0.00035 |
| AVERAGE HEAD ON TOP OF LAYER 4 | 0.174 | |
| MAXIMUM HEAD ON TOP OF LAYER 4 | 0.339 | |
| LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN) | 5.9 FEET | |
| PERCOLATION/LEAKAGE THROUGH LAYER 6 | 0.000000 | 0.00035 |
| AVERAGE HEAD ON TOP OF LAYER 6 | 0.000 | |
| SNOW WATER | 2.24 | 8132.3433 |

| | |
|---|---|
| MAXIMUM VEG. SOIL WATER (VOL/VOL) | 0.4232 |
| MINIMUM VEG. SOIL WATER (VOL/VOL) | 0.0770 |

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 19.1927 | 0.3199 |
| 2 | 5.3259 | 0.2219 |
| 3 | 0.0086 | 0.0455 |
| 4 | 0.0000 | 0.0000 |
| 5 | 0.1867 | 0.7470 |
| 6 | 7.6860 | 0.4270 |

SNOW WATER 0.000

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CMS LANDFILL V CELL 2G (REVISED)

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******************************************************************************
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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:      C:\CMSLF\DATA4.D4
TEMPERATURE DATA FILE:        C:\CMSLF\DATA7.D7
SOLAR RADIATION DATA FILE:    C:\CMSLF\DATA13.D13
EVAPOTRANSPIRATION DATA:      C:\CMSLF\DATA11.D11
SOIL AND DESIGN DATA FILE:    C:\CMSLF\70FTALT\DATA10.D10
OUTPUT DATA FILE:             C:\CMSLF\70FTALT\70FTALT.OUT


TIME:  10:49     DATE:   7/24/2008


******************************************************************************

     TITLE:  CMS LANDFILL V CELL 2G - 70 FT. OF WASTE W/ ALTERNATE LINER

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  11
          THICKNESS                    =     12.00   INCHES
          POROSITY                     =      0.4640 VOL/VOL
          FIELD CAPACITY               =      0.3100 VOL/VOL
          WILTING POINT                =      0.1870 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.2866 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.639999998000E-04 CM/SEC
```

CMS LANDFILL V CELL 2G (REVISED)

LAYER 2

---

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 18

| | | | |
|---|---|---|---|
| THICKNESS | = | 840.00 | INCHES |
| POROSITY | = | 0.6710 | VOL/VOL |
| FIELD CAPACITY | = | 0.2920 | VOL/VOL |
| WILTING POINT | = | 0.0770 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2945 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.100000005000E-02 | CM/SEC |

LAYER 3

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TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 24.00 | INCHES |
| POROSITY | = | 0.4570 | VOL/VOL |
| FIELD CAPACITY | = | 0.1310 | VOL/VOL |
| WILTING POINT | = | 0.0580 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2164 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.660000020000E-03 | CM/SEC |

LAYER 4

---

TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.19 | INCHES |
| POROSITY | = | 0.8500 | VOL/VOL |
| FIELD CAPACITY | = | 0.0100 | VOL/VOL |
| WILTING POINT | = | 0.0050 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0470 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 4.82800007000 | CM/SEC |
| SLOPE | = | 2.00 | PERCENT |
| DRAINAGE LENGTH | = | 250.0 | FEET |

LAYER 5

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TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 35

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.06 | INCHES |
| POROSITY | = | 0.0000 | VOL/VOL |
| FIELD CAPACITY | = | 0.0000 | VOL/VOL |
| WILTING POINT | = | 0.0000 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0000 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.199999996000E-12 | CM/SEC |
| FML PINHOLE DENSITY | = | 4.00 | HOLES/ACRE |

CMS LANDFILL V CELL 2G (REVISED)

| | | | |
|---|---|---|---|
| FML INSTALLATION DEFECTS | = | 3.00 | HOLES/ACRE |
| FML PLACEMENT QUALITY | = | 3 - GOOD | |

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.25 | INCHES |
| POROSITY | = | 0.7500 | VOL/VOL |
| FIELD CAPACITY | = | 0.7470 | VOL/VOL |
| WILTING POINT | = | 0.4000 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.7470 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.499999997000E-08 | CM/SEC |

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 18.00 | INCHES |
| POROSITY | = | 0.4270 | VOL/VOL |
| FIELD CAPACITY | = | 0.4180 | VOL/VOL |
| WILTING POINT | = | 0.3670 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.4270 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.999999975000E-05 | CM/SEC |

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #11 WITH A POOR STAND OF GRASS, A SURFACE SLOPE OF 33.% AND A SLOPE LENGTH OF 100. FEET.

| | | | |
|---|---|---|---|
| SCS RUNOFF CURVE NUMBER | = | 91.80 | |
| FRACTION OF AREA ALLOWING RUNOFF | = | 50.0 | PERCENT |
| AREA PROJECTED ON HORIZONTAL PLANE | = | 1.000 | ACRES |
| EVAPORATIVE ZONE DEPTH | = | 10.0 | INCHES |
| INITIAL WATER IN EVAPORATIVE ZONE | = | 2.765 | INCHES |
| UPPER LIMIT OF EVAPORATIVE STORAGE | = | 4.640 | INCHES |
| LOWER LIMIT OF EVAPORATIVE STORAGE | = | 1.870 | INCHES |
| INITIAL SNOW WATER | = | 0.000 | INCHES |
| INITIAL WATER IN LAYER MATERIALS | = | 263.858 | INCHES |
| TOTAL INITIAL WATER | = | 263.858 | INCHES |
| TOTAL SUBSURFACE INFLOW | = | 0.00 | INCHES/YEAR |

CMS LANDFILL V CELL 2G (REVISED)

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
CHARLOTTE NORTH CAROLINA

| | | | |
|---|---|---|---|
| STATION LATITUDE | = | 35.20 | DEGREES |
| MAXIMUM LEAF AREA INDEX | = | 0.00 | |
| START OF GROWING SEASON (JULIAN DATE) | = | 83 | |
| END OF GROWING SEASON (JULIAN DATE) | = | 312 | |
| EVAPORATIVE ZONE DEPTH | = | 10.0 | INCHES |
| AVERAGE ANNUAL WIND SPEED | = | 7.50 | MPH |
| AVERAGE 1ST QUARTER RELATIVE HUMIDITY | = | 64.00 | % |
| AVERAGE 2ND QUARTER RELATIVE HUMIDITY | = | 67.00 | % |
| AVERAGE 3RD QUARTER RELATIVE HUMIDITY | = | 74.00 | % |
| AVERAGE 4TH QUARTER RELATIVE HUMIDITY | = | 70.00 | % |

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 3.80 | 3.81 | 4.83 | 3.27 | 3.64 | 3.57 |
| 3.92 | 3.75 | 3.59 | 2.72 | 2.86 | 3.40 |

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 40.50 | 42.90 | 50.40 | 60.30 | 68.20 | 75.00 |
| 78.50 | 77.90 | 72.00 | 60.70 | 50.70 | 42.60 |

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA
AND STATION LATITUDE = 35.20 DEGREES

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ANNUAL TOTALS FOR YEAR 1

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.37 | 142913.141 | 100.00 |

| | | | |
|---|---|---|---|
| RUNOFF | 1.800 | 6535.058 | 4.57 |
| EVAPOTRANSPIRATION | 30.311 | 110030.453 | 76.99 |
| DRAINAGE COLLECTED FROM LAYER 4 | 7.2537 | 26330.775 | 18.42 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000004 | 0.015 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0091 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000004 | 0.015 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 0.005 | 16.838 | 0.01 |
| SOIL WATER AT START OF YEAR | 264.044 | 958480.750 | |
| SOIL WATER AT END OF YEAR | 264.049 | 958497.562 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.002 | 0.00 |

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ANNUAL TOTALS FOR YEAR 2

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.97 | 166871.141 | 100.00 |
| RUNOFF | 3.304 | 11993.194 | 7.19 |
| EVAPOTRANSPIRATION | 30.421 | 110427.805 | 66.18 |
| DRAINAGE COLLECTED FROM LAYER 4 | 15.0964 | 54800.105 | 32.84 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0191 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | -2.851 | -10349.953 | -6.20 |
| SOIL WATER AT START OF YEAR | 264.049 | 958497.562 | |
| SOIL WATER AT END OF YEAR | 261.198 | 948147.625 | |

| | | | |
|---|---|---|---|
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.028 | 0.00 |

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ANNUAL TOTALS FOR YEAR 3

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.06 | 174457.781 | 100.00 |
| RUNOFF | 3.524 | 12792.710 | 7.33 |
| EVAPOTRANSPIRATION | 32.708 | 118728.336 | 68.06 |
| DRAINAGE COLLECTED FROM LAYER 4 | 11.1854 | 40603.184 | 23.27 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000005 | 0.018 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0140 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000005 | 0.018 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 0.643 | 2333.621 | 1.34 |
| SOIL WATER AT START OF YEAR | 261.198 | 948147.625 | |
| SOIL WATER AT END OF YEAR | 261.591 | 949575.875 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.249 | 905.349 | 0.52 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.091 | 0.00 |

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ANNUAL TOTALS FOR YEAR 4

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 36.84 | 133729.203 | 100.00 |
| RUNOFF | 1.772 | 6433.193 | 4.81 |

| | | | |
|---|---|---|---|
| EVAPOTRANSPIRATION | 29.160 | 105851.219 | 79.15 |
| DRAINAGE COLLECTED FROM LAYER 4 | 4.8925 | 17759.654 | 13.28 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000004 | 0.013 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0061 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000004 | 0.013 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 1.015 | 3684.992 | 2.76 |
| SOIL WATER AT START OF YEAR | 261.591 | 949575.875 | |
| SOIL WATER AT END OF YEAR | 262.856 | 954166.250 | |
| SNOW WATER AT START OF YEAR | 0.249 | 905.349 | 0.68 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.127 | 0.00 |

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ANNUAL TOTALS FOR YEAR 5

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.76 | 166108.812 | 100.00 |
| RUNOFF | 3.505 | 12724.660 | 7.66 |
| EVAPOTRANSPIRATION | 30.807 | 111828.297 | 67.32 |
| DRAINAGE COLLECTED FROM LAYER 4 | 10.0276 | 36400.086 | 21.91 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000005 | 0.017 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0125 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000005 | 0.017 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 1.420 | 5155.535 | 3.10 |
| SOIL WATER AT START OF YEAR | 262.856 | 954166.250 | |
| SOIL WATER AT END OF YEAR | 264.276 | 959321.750 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |

| | | | |
|---|---|---|---|
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0001 | 0.210 | 0.00 |

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| **PRECIPITATION** | | | | | | |
| TOTALS | 3.35 | 3.78 | 5.11 | 2.89 | 3.89 | 4.60 |
| | 3.88 | 3.64 | 3.32 | 3.80 | 1.67 | 3.27 |
| STD. DEVIATIONS | 2.40 | 1.67 | 1.54 | 1.83 | 2.41 | 1.14 |
| | 1.36 | 2.89 | 1.20 | 2.01 | 1.40 | 1.72 |
| **RUNOFF** | | | | | | |
| TOTALS | 0.245 | 0.198 | 0.444 | 0.075 | 0.305 | 0.266 |
| | 0.109 | 0.231 | 0.300 | 0.356 | 0.049 | 0.202 |
| STD. DEVIATIONS | 0.310 | 0.162 | 0.375 | 0.096 | 0.479 | 0.127 |
| | 0.101 | 0.295 | 0.196 | 0.337 | 0.074 | 0.183 |
| **EVAPOTRANSPIRATION** | | | | | | |
| TOTALS | 1.619 | 2.179 | 3.215 | 3.021 | 3.294 | 3.029 |
| | 4.146 | 2.588 | 2.549 | 2.143 | 1.565 | 1.333 |
| STD. DEVIATIONS | 0.132 | 0.236 | 0.225 | 1.061 | 1.736 | 1.027 |
| | 1.763 | 1.658 | 1.391 | 1.005 | 0.746 | 0.116 |
| **LATERAL DRAINAGE COLLECTED FROM LAYER 4** | | | | | | |
| TOTALS | 0.8391 | 0.7696 | 1.1847 | 1.8019 | 1.0244 | 0.6319 |
| | 0.6005 | 0.4469 | 0.4418 | 0.5418 | 0.7762 | 0.6322 |
| STD. DEVIATIONS | 0.6049 | 0.7669 | 0.7611 | 0.9738 | 0.6151 | 0.5789 |
| | 0.6090 | 0.3001 | 0.4065 | 0.5393 | 0.6762 | 0.3634 |
| **PERCOLATION/LEAKAGE THROUGH LAYER 5** | | | | | | |
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

CMS LANDFILL V CELL 2G (REVISED)

PERCOLATION/LEAKAGE THROUGH LAYER 7

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0124 | 0.0125 | 0.0175 | 0.0274 | 0.0151 | 0.0096 |
| | 0.0089 | 0.0066 | 0.0067 | 0.0080 | 0.0118 | 0.0093 |
| STD. DEVIATIONS | 0.0089 | 0.0125 | 0.0112 | 0.0148 | 0.0091 | 0.0088 |
| | 0.0090 | 0.0044 | 0.0062 | 0.0079 | 0.0103 | 0.0054 |

DAILY AVERAGE HEAD ON TOP OF LAYER 7

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

| | INCHES | | CU. FEET | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 43.20 | ( 4.821) | 156816.0 | 100.00 |
| RUNOFF | 2.781 | ( 0.9124) | 10095.76 | 6.438 |
| EVAPOTRANSPIRATION | 30.681 | ( 1.2884) | 111373.23 | 71.022 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 4 | 9.69112 | ( 3.89012) | 35178.758 | 22.43314 |
| PERCOLATION/LEAKAGE THROUGH LAYER 5 | 0.00000 | ( 0.00000) | 0.017 | 0.00001 |
| AVERAGE HEAD ON TOP OF LAYER 5 | 0.012 | ( 0.005) | | |
| PERCOLATION/LEAKAGE THROUGH LAYER 7 | 0.00000 | ( 0.00000) | 0.017 | 0.00001 |
| AVERAGE HEAD ON TOP | 0.000 | ( 0.000) | | |

OF LAYER 7

| | | | | |
|---|---|---|---|---|
| CHANGE IN WATER STORAGE | 0.046 | ( 1.7014) | 168.21 | 0.107 |

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 2.43 | 8820.900 |
| RUNOFF | 0.495 | 1796.6948 |
| DRAINAGE COLLECTED FROM LAYER 4 | 0.16527 | 599.93256 |
| PERCOLATION/LEAKAGE THROUGH LAYER 5 | 0.000000 | 0.00016 |
| AVERAGE HEAD ON TOP OF LAYER 5 | 0.076 | |
| MAXIMUM HEAD ON TOP OF LAYER 5 | 0.149 | |
| LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN) | 3.3 FEET | |
| PERCOLATION/LEAKAGE THROUGH LAYER 7 | 0.000000 | 0.00016 |
| AVERAGE HEAD ON TOP OF LAYER 7 | 0.000 | |
| SNOW WATER | 2.24 | 8132.3433 |

| | |
|---|---|
| MAXIMUM VEG. SOIL WATER (VOL/VOL) | 0.4308 |
| MINIMUM VEG. SOIL WATER (VOL/VOL) | 0.1870 |

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

CMS LANDFILL V CELL 2G (REVISED)

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 3.9943 | 0.3329 |
| 2 | 246.8338 | 0.2938 |
| 3 | 5.3839 | 0.2243 |
| 4 | 0.0046 | 0.0240 |
| 5 | 0.0000 | 0.0000 |
| 6 | 0.1867 | 0.7470 |
| 7 | 7.6860 | 0.4270 |
| SNOW WATER | 0.000 | |

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CMS LANDFILL V CELL 2G (REVISED)

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******************************************************************************
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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\CMSLF\DATA4.D4
TEMPERATURE DATA FILE:       C:\CMSLF\DATA7.D7
SOLAR RADIATION DATA FILE:   C:\CMSLF\DATA13.D13
EVAPOTRANSPIRATION DATA:     C:\CMSLF\DATA11.D11
SOIL AND DESIGN DATA FILE:   C:\CMSLF\130FTALT\DATA10.D10
OUTPUT DATA FILE:            C:\CMSLF\130FTALT\130FTALT.OUT


TIME:  10:50     DATE:   7/24/2008


******************************************************************************

     TITLE:  CMS LANDFILL V CELL 2G - 130 FT. OF WASTE W/ ALTERNATE LINER

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  11
          THICKNESS                    =     12.00   INCHES
          POROSITY                     =      0.4640 VOL/VOL
          FIELD CAPACITY               =      0.3100 VOL/VOL
          WILTING POINT                =      0.1870 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.2900 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.639999998000E-04 CM/SEC
```

CMS LANDFILL V CELL 2G (REVISED)

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

| | | | |
|---|---|---|---|
| THICKNESS | = | 1560.00 | INCHES |
| POROSITY | = | 0.6710 | VOL/VOL |
| FIELD CAPACITY | = | 0.2920 | VOL/VOL |
| WILTING POINT | = | 0.0770 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2935 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.100000005000E-02 | CM/SEC |

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 24.00 | INCHES |
| POROSITY | = | 0.4570 | VOL/VOL |
| FIELD CAPACITY | = | 0.1310 | VOL/VOL |
| WILTING POINT | = | 0.0580 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2088 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.660000020000E-03 | CM/SEC |

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.19 | INCHES |
| POROSITY | = | 0.8500 | VOL/VOL |
| FIELD CAPACITY | = | 0.0100 | VOL/VOL |
| WILTING POINT | = | 0.0050 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0437 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 4.82800007000 | CM/SEC |
| SLOPE | = | 2.00 | PERCENT |
| DRAINAGE LENGTH | = | 250.0 | FEET |

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.06 | INCHES |
| POROSITY | = | 0.0000 | VOL/VOL |
| FIELD CAPACITY | = | 0.0000 | VOL/VOL |
| WILTING POINT | = | 0.0000 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0000 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.199999996000E-12 | CM/SEC |
| FML PINHOLE DENSITY | = | 4.00 | HOLES/ACRE |

CMS LANDFILL V CELL 2G (REVISED)

| | | | |
|---|---|---|---|
| FML INSTALLATION DEFECTS | = | 3.00 | HOLES/ACRE |
| FML PLACEMENT QUALITY | = | 3 - GOOD | |

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.25 | INCHES |
| POROSITY | = | 0.7500 | VOL/VOL |
| FIELD CAPACITY | = | 0.7470 | VOL/VOL |
| WILTING POINT | = | 0.4000 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.7470 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.499999997000E-08 | CM/SEC |

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 0

| | | | |
|---|---|---|---|
| THICKNESS | = | 18.00 | INCHES |
| POROSITY | = | 0.4270 | VOL/VOL |
| FIELD CAPACITY | = | 0.4180 | VOL/VOL |
| WILTING POINT | = | 0.3670 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.4270 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.999999975000E-05 | CM/SEC |

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #11 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 33.% AND A SLOPE LENGTH OF 460. FEET.

| | | | |
|---|---|---|---|
| SCS RUNOFF CURVE NUMBER | = | 87.40 | |
| FRACTION OF AREA ALLOWING RUNOFF | = | 100.0 | PERCENT |
| AREA PROJECTED ON HORIZONTAL PLANE | = | 1.000 | ACRES |
| EVAPORATIVE ZONE DEPTH | = | 10.0 | INCHES |
| INITIAL WATER IN EVAPORATIVE ZONE | = | 2.787 | INCHES |
| UPPER LIMIT OF EVAPORATIVE STORAGE | = | 4.640 | INCHES |
| LOWER LIMIT OF EVAPORATIVE STORAGE | = | 1.870 | INCHES |
| INITIAL SNOW WATER | = | 0.000 | INCHES |
| INITIAL WATER IN LAYER MATERIALS | = | 474.267 | INCHES |
| TOTAL INITIAL WATER | = | 474.267 | INCHES |
| TOTAL SUBSURFACE INFLOW | = | 0.00 | INCHES/YEAR |

CMS LANDFILL V CELL 2G (REVISED)

## EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
CHARLOTTE NORTH CAROLINA

| | | | |
|---|---|---|---|
| STATION LATITUDE | = | 35.20 | DEGREES |
| MAXIMUM LEAF AREA INDEX | = | 0.00 | |
| START OF GROWING SEASON (JULIAN DATE) | = | 83 | |
| END OF GROWING SEASON (JULIAN DATE) | = | 312 | |
| EVAPORATIVE ZONE DEPTH | = | 10.0 | INCHES |
| AVERAGE ANNUAL WIND SPEED | = | 7.50 | MPH |
| AVERAGE 1ST QUARTER RELATIVE HUMIDITY | = | 64.00 | % |
| AVERAGE 2ND QUARTER RELATIVE HUMIDITY | = | 67.00 | % |
| AVERAGE 3RD QUARTER RELATIVE HUMIDITY | = | 74.00 | % |
| AVERAGE 4TH QUARTER RELATIVE HUMIDITY | = | 70.00 | % |

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 3.80 | 3.81 | 4.83 | 3.27 | 3.64 | 3.57 |
| 3.92 | 3.75 | 3.59 | 2.72 | 2.86 | 3.40 |

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 40.50 | 42.90 | 50.40 | 60.30 | 68.20 | 75.00 |
| 78.50 | 77.90 | 72.00 | 60.70 | 50.70 | 42.60 |

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHARLOTTE NORTH CAROLINA
AND STATION LATITUDE = 35.20 DEGREES

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ANNUAL TOTALS FOR YEAR 1

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.37 | 142913.141 | 100.00 |

| | | | |
|---|---|---|---|
| RUNOFF | 1.167 | 4237.229 | 2.96 |
| EVAPOTRANSPIRATION | 30.657 | 111285.383 | 77.87 |
| DRAINAGE COLLECTED FROM LAYER 4 | 7.5549 | 27424.359 | 19.19 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000004 | 0.015 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0096 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000004 | 0.015 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | -0.009 | -33.677 | -0.02 |
| SOIL WATER AT START OF YEAR | 474.454 | 1722268.250 | |
| SOIL WATER AT END OF YEAR | 474.445 | 1722234.620 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.175 | 0.00 |

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ANNUAL TOTALS FOR YEAR 2

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.97 | 166871.141 | 100.00 |
| RUNOFF | 3.582 | 13004.465 | 7.79 |
| EVAPOTRANSPIRATION | 30.613 | 111125.328 | 66.59 |
| DRAINAGE COLLECTED FROM LAYER 4 | 14.7819 | 53658.277 | 32.16 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0186 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | -3.007 | -10917.030 | -6.54 |
| SOIL WATER AT START OF YEAR | 474.445 | 1722234.620 | |
| SOIL WATER AT END OF YEAR | 471.437 | 1711317.620 | |

| | | | |
|---|---|---|---|
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.081 | 0.00 |

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ANNUAL TOTALS FOR YEAR 3

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.06 | 174457.781 | 100.00 |
| RUNOFF | 3.215 | 11669.928 | 6.69 |
| EVAPOTRANSPIRATION | 33.155 | 120353.047 | 68.99 |
| DRAINAGE COLLECTED FROM LAYER 4 | 11.0345 | 40055.352 | 22.96 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000005 | 0.018 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0138 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000005 | 0.018 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 0.656 | 2379.483 | 1.36 |
| SOIL WATER AT START OF YEAR | 471.437 | 1711317.620 | |
| SOIL WATER AT END OF YEAR | 471.843 | 1712791.750 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.249 | 905.349 | 0.52 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.052 | 0.00 |

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ANNUAL TOTALS FOR YEAR 4

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 36.84 | 133729.203 | 100.00 |
| RUNOFF | 1.394 | 5060.755 | 3.78 |

| | | | |
|---|---|---|---|
| EVAPOTRANSPIRATION | 29.251 | 106182.422 | 79.40 |
| DRAINAGE COLLECTED FROM LAYER 4 | 5.1003 | 18513.992 | 13.84 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000004 | 0.013 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0064 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000004 | 0.013 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 1.094 | 3971.799 | 2.97 |
| SOIL WATER AT START OF YEAR | 471.843 | 1712791.750 | |
| SOIL WATER AT END OF YEAR | 473.187 | 1717668.870 | |
| SNOW WATER AT START OF YEAR | 0.249 | 905.349 | 0.68 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0001 | 0.219 | 0.00 |

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ANNUAL TOTALS FOR YEAR 5

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.76 | 166108.812 | 100.00 |
| RUNOFF | 3.064 | 11123.538 | 6.70 |
| EVAPOTRANSPIRATION | 30.616 | 111135.687 | 66.91 |
| DRAINAGE COLLECTED FROM LAYER 4 | 10.6447 | 38640.199 | 23.26 |
| PERC./LEAKAGE THROUGH LAYER 5 | 0.000005 | 0.017 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 5 | 0.0132 | | |
| PERC./LEAKAGE THROUGH LAYER 7 | 0.000005 | 0.017 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 7 | 0.0000 | | |
| CHANGE IN WATER STORAGE | 1.435 | 5209.374 | 3.14 |
| SOIL WATER AT START OF YEAR | 473.187 | 1717668.870 | |
| SOIL WATER AT END OF YEAR | 474.622 | 1722878.250 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |

| | | | |
|---|---|---|---|
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.010 | 0.00 |

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| **PRECIPITATION** | | | | | | |
| TOTALS | 3.35 | 3.78 | 5.11 | 2.89 | 3.89 | 4.60 |
| | 3.88 | 3.64 | 3.32 | 3.80 | 1.67 | 3.27 |
| STD. DEVIATIONS | 2.40 | 1.67 | 1.54 | 1.83 | 2.41 | 1.14 |
| | 1.36 | 2.89 | 1.20 | 2.01 | 1.40 | 1.72 |
| **RUNOFF** | | | | | | |
| TOTALS | 0.257 | 0.148 | 0.435 | 0.038 | 0.341 | 0.205 |
| | 0.057 | 0.214 | 0.273 | 0.357 | 0.022 | 0.138 |
| STD. DEVIATIONS | 0.340 | 0.139 | 0.449 | 0.074 | 0.685 | 0.149 |
| | 0.083 | 0.304 | 0.204 | 0.385 | 0.040 | 0.124 |
| **EVAPOTRANSPIRATION** | | | | | | |
| TOTALS | 1.597 | 2.168 | 3.238 | 3.027 | 3.400 | 2.971 |
| | 4.159 | 2.615 | 2.557 | 2.194 | 1.600 | 1.333 |
| STD. DEVIATIONS | 0.153 | 0.261 | 0.220 | 1.052 | 1.734 | 0.849 |
| | 1.809 | 1.652 | 1.391 | 1.028 | 0.745 | 0.113 |
| **LATERAL DRAINAGE COLLECTED FROM LAYER 4** | | | | | | |
| TOTALS | 0.7676 | 0.8464 | 1.1317 | 1.7564 | 1.2001 | 0.6843 |
| | 0.5423 | 0.5393 | 0.4245 | 0.5622 | 0.7227 | 0.6457 |
| STD. DEVIATIONS | 0.5039 | 0.7293 | 0.7365 | 0.9620 | 0.6066 | 0.6024 |
| | 0.5398 | 0.4007 | 0.3671 | 0.6027 | 0.5970 | 0.3850 |
| **PERCOLATION/LEAKAGE THROUGH LAYER 5** | | | | | | |
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

CMS LANDFILL V CELL 2G (REVISED)

PERCOLATION/LEAKAGE THROUGH LAYER 7

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0113 | 0.0138 | 0.0167 | 0.0267 | 0.0177 | 0.0104 |
| | 0.0080 | 0.0079 | 0.0065 | 0.0083 | 0.0110 | 0.0095 |
| STD. DEVIATIONS | 0.0074 | 0.0119 | 0.0109 | 0.0147 | 0.0089 | 0.0092 |
| | 0.0080 | 0.0059 | 0.0056 | 0.0089 | 0.0091 | 0.0057 |

DAILY AVERAGE HEAD ON TOP OF LAYER 7

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

| | INCHES | | CU. FEET | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 43.20 | ( 4.821) | 156816.0 | 100.00 |
| RUNOFF | 2.485 | ( 1.1179) | 9019.18 | 5.751 |
| EVAPOTRANSPIRATION | 30.859 | ( 1.4157) | 112016.37 | 71.432 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 4 | 9.82326 | ( 3.68042) | 35658.434 | 22.73903 |
| PERCOLATION/LEAKAGE THROUGH LAYER 5 | 0.00000 | ( 0.00000) | 0.017 | 0.00001 |
| AVERAGE HEAD ON TOP OF LAYER 5 | 0.012 | ( 0.005) | | |
| PERCOLATION/LEAKAGE THROUGH LAYER 7 | 0.00000 | ( 0.00000) | 0.017 | 0.00001 |
| AVERAGE HEAD ON TOP | 0.000 | ( 0.000) | | |

OF LAYER 7

| | | | | |
|---|---|---|---|---|
| CHANGE IN WATER STORAGE | 0.034 | ( 1.7836) | 121.99 | 0.078 |

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 2.43 | 8820.900 |
| RUNOFF | 0.608 | 2208.2266 |
| DRAINAGE COLLECTED FROM LAYER 4 | 0.15911 | 577.57806 |
| PERCOLATION/LEAKAGE THROUGH LAYER 5 | 0.000000 | 0.00015 |
| AVERAGE HEAD ON TOP OF LAYER 5 | 0.073 | |
| MAXIMUM HEAD ON TOP OF LAYER 5 | 0.144 | |
| LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN) | 2.9 FEET | |
| PERCOLATION/LEAKAGE THROUGH LAYER 7 | 0.000000 | 0.00015 |
| AVERAGE HEAD ON TOP OF LAYER 7 | 0.000 | |
| SNOW WATER | 2.24 | 8132.3433 |

| | |
|---|---|
| MAXIMUM VEG. SOIL WATER (VOL/VOL) | 0.4165 |
| MINIMUM VEG. SOIL WATER (VOL/VOL) | 0.1870 |

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

CMS LANDFILL V CELL 2G (REVISED)

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 4.2097 | 0.3508 |
| 2 | 456.8672 | 0.2929 |
| 3 | 5.4770 | 0.2282 |
| 4 | 0.0088 | 0.0463 |
| 5 | 0.0000 | 0.0000 |
| 6 | 0.1867 | 0.7470 |
| 7 | 7.6860 | 0.4270 |
| SNOW WATER | 0.000 | |

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of NORTH CAROLINA, PLLC

# APPENDIX B
# Listing of CQA Personnel

JUNE 2008

**LISTING OF ACC**
**SITE CQA PERSONNEL**

| ACC PERSONNEL | ACC POSITION TITLE | PERSONNEL INITIALS |
|---|---|---|
| | | |
| RICHARD T. DEASON | CERTIFYING ENGINEER | RTD |
| R. SCOTT CALLAWAY | PROJECT MANAGER | RSC |
| TIM J. SCHREIBER | ASSISTANT PROJECT MANAGER | TJS |
| LARRY E. FREEMAN | LEAD GEOSYNTHETICS MONITOR | LEF |
| BEN L. MCFRY | RESIDENT SITE MONITOR | BLM |
| TAYLOR HERBERTSON | GEOSYNTHETICS MONITOR | TH |
| | | |

***ATLANTIC COAST CONSULTING, INC.***

of NORTH CAROLINA, PLLC

# APPENDIX C

## Resident Manager's Daily Summary Reports

# Geosynthetic Installation Monitoring Report



Date: June 9, 2008 S (M) T W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: None

Field Seaming Activities: None

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Fornhardt continued to maintain clay soil surface.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 10, 2008 S M (T) W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran 4 fusion welded trial seams. All meeting project specifications.

Geosynthetic Deployment Activities: They deployed approx. 50,500 sq. ft. of both GCL and 60 mil HDPE.

Field Seaming Activities: They used 2 fusion welders to weld all seams on the HDPE.

Non-Destructive Testing: Some of the fusion welded seams were pressure tested.

Destructive Testing: Samples DS-1 through DS-5 were marked on the HDPE.

General Remarks: Earnhardt Grading continued to maintain the clay soil surface prior to deployment.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: JUNE 11, 2008 S M T (W) T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: EST RAN A TOTAL of 9 trial weld test. 8 test WERE RUN fusion welded seams AND 1 test WAS ran on an EXTRUSION welded seam. All meeting project specs.

Geosynthetic Deployment Activities: They Deployed Approx. 90,600 SF of both GCL and 60mil HDPE.

Field Seaming Activities: EST used 3 fusion welders to weld All seams including the TIE IN, and 1 Extrusion gun MADE some of the REPAIRS.

Non-Destructive Testing: They PRESSURE tested most of the fusion welded seams.

Destructive Testing: SAMPLES DS-6 thru DS-15 and DX-1 were MARKED on the HDPE. SAMPLES DS-1 thru DS-7 Along with DX-1, WAS sent overnight to the LAB.

General Remarks: Earnhardt continue to maintain dry surface in front of Deployment.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: JUNE 12, 2008 S M T W (T) F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: THERE WERE 4 Fusion And 4 Extrusion TRIAL welds today. All trial welds passed.

Geosynthetic Deployment Activities: Approximately 30,500 $ft^2$ of GCL And 60mil HDPE were installed today.

Field Seaming Activities: Two Fusion welders And two Extrusion gun welded All seams And repairs today.

Non-Destructive Testing: All seams were Air tested today. All Repairs were Also vacuum tested today.

Destructive Testing: Samples Ds 16-Ds 18 And Dx-2 were Marked on HDPE. Samples Dx-2 And Ds-8 thru Ds-15 were sent to the Lab for testing.

General Remarks: Earnhardt Grading maintained the Clay surface in front of Deployment.

Submitted by: Ben M
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 13, 2008 S M T W T (F) S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran a total of 11 trial weld tests. 9 on fusion welded seams and 2 on extrusioned seams All meeting project specifications

Geosynthetic Deployment Activities: They deployed approx. 104,400 sq.ft. of both GCL and 60 Mil HDPE.

Field Seaming Activities: They used 2 fusion welders to seam the deployed HDPE.

Non-Destructive Testing: They pressure tested some of the fusion welded seams. Those seams that were tested, met project specifications.

Destructive Testing: Samples DS-19 through DS-28 were marked.

General Remarks: Earnhardt Grading continued to maintain clay surface prior to the deployment of synthetics.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: JUNE 14, 2008 S M T W T F (S)

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: There were a total of 9 trial weld test. 6 Test of fusion welded seams, and 3 on Extension welded seams. All meeting project specifications.

Geosynthetic Deployment Activities: ESI. deployed Approximatly 48,500 $FT^2$ of GCL and 60mil. HDPE.

Field Seaming Activities: They used 3 fusion welders to weld seams on Deployed HDPE seams for TODAY.

Non-Destructive Testing: They Pressure test some of the fusion welded seams and Vacuum tested a couple of the Extrusion welded repairs. The tested seams met project specifications.

Destructive Testing: Samples DS-29 – DS-32 were marked.

General Remarks: Earnhardt Grading continues to maintain dry surface in front of Deployment.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 16, 2008 S (M) T W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: There were a total of 13 trial weld test done today. 11 fusion and 2 extrusion trials which all met project specifications.

Geosynthetic Deployment Activities: ESI deployed approximatly 91,800 $ft^2$ of GCL and 60 mil HDPE.

Field Seaming Activities: They used 3 fusion welders ... to weld seams and 1 extrusion welder to make pepmas.

Non-Destructive Testing: They pressure tested some of the fusion welded seams

Destructive Testing: Samples DS-33 thru DS-41 were marked.

General Remarks: Earnhardt Grading continued to maintain clay surface in front of Deployment.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 17, 2008 S M (T) W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran a total of 10 trial weld tests. 9 tests on fusion welded seams and 1 on extrusioned seam. All met project specs.

Geosynthetic Deployment Activities: They deployed approx. 78,200 sq ft. of both GCL and 60 mil HDPE.

Field Seaming Activities: They used 3 fusion welders to seam the deployed HDPE. They used 1 extrusion gun to make repairs on the HDPE.

Non-Destructive Testing: They pressure tested some of fusion welded seams.

Destructive Testing: We marked samples DS-42 through DS-47

General Remarks: Earnhardt Grading continued to maintain the clay soil surface infront of the synthetics.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 18, 2008 S M T (W) T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: There were a total of 10 trial weld Test Done today. 8 fusion and 2 extrusion trials which all met project Specification.

Geosynthetic Deployment Activities: ESI Deployed Approximatly 54,900ft$^2$ of GCL and 60 mil. HDPE.

Field Seaming Activities: They used 2 fusion welders and 1 extrusion to weld seams. The 1 extrusion welder also made repairs.

Non-Destructive Testing: they pressure tested some of the fusion welded seams.

Destructive Testing: Samples DS-48 thru DS-53 were marked.

General Remarks: Earnhardt Grading continued to maintain the clay surface in front of Deployment.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 19, 2008 S M T W (T) F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI did a Total of 11 trial welds. 9 trials on Fusion And 2 of Extrusion welds. All Meeting project specifications.

Geosynthetic Deployment Activities: They Deployed 50,240 $ft^2$ of GCL And 60 mil HDPE. The cell is NOW Blanked out.

Field Seaming Activities: They used 2 fusion welders to weld the HDPE seams. Used 1 Extrusion gun to make repairs

Non-Destructive Testing: They performed Pressure test on some of the Fusion welded seams.

Destructive Testing: Samples Ds-54 – Ds61 And Dx-60 were Marked. Samples Ds-38 – Ds47, Ds50, 51, 54, 55, Dx54 and Dx5B1 were sent to the Laboratory For Testing.

General Remarks: Earnhardt Grading continued to maintain clay in front of Deployment.

Submitted by: Ron McFayden
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 20, 2008 S M T W T (F) S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI Ran 4 extrusion welded TRIAL Seams test. All meeting project specifications.

Geosynthetic Deployment Activities: None

Field Seaming Activities: They used 2 extrusion guns to make repairs and weld some of the TIE IN seams.

Non-Destructive Testing: Completed All pressure Testing on Fusion welded seams: and vacuum tested, Extrusion welded repairs and seams.

Destructive Testing: Samples DX-7 & Dx-8 were marked. Samples DX-6, 7 And 8 Along with Ds-48, 49, 52, 53, 56 thru DS 61 were sent overnight to the Lab. for testing.

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 21, 2008 S M T W T F (S)

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI Ran 2 Extrusion welded TRIAL Seam Tests. Both meeting project specifications.

Geosynthetic Deployment Activities: They deployed 260 ft$^2$ of both GCL And 60mil. HDPE.

Field Seaming Activities: They used 2 extrusion guns to make repairs and complete seams at THE IN.

Non-Destructive Testing: They VACUUM tested All repairs And seams made by extrusion guns.

Destructive Testing: Samples DX5A2 Along with DX9 and 10 were marked and sent to the Lab. for testing.

General Remarks: ESI cleaned up the site. All liner (HDPE) work is complete. (Waiting on final Destructive results)

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 23 2008 S (M) T W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: EST deployed approximatly 91,800 ft² of composite.

Field Seaming Activities: They sewned all plastic with zip ties and fabric was sewned to project specifications.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading pumped rain water from sump areas and maintained access roads.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 24, 2008 S M (T) W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: There was 1 trial seam on an Extrusion weld that met project specifications.

Geosynthetic Deployment Activities: None

Field Seaming Activities: ESI Extrusion welded 1 failed repair (DX-5A3) and repaired 1 defect due to installation damage.

Non-Destructive Testing: They vacuum tested all Extrusion welded repairs made today.

Destructive Testing: Samples DX-5A3 was sent overnight to the laboratory for testing.

General Remarks: Earnhart Grading continued to pump rain water out of the sump areas.

Submitted by: _____
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: June 25, 2008 S M T (W) T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: None

Field Seaming Activities: None

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading continued to clean sump areas. The composite material did not come today. Supposed to tomorrow.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 6-26-08 S M T W (T) F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 8,100 $ft^2$ of geocomposite. All geocomposite was deployed along the tie in.

Field Seaming Activities: ESI joined the geocomposite with zip ties every 1' along the tie in. They covered the seams with textile.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading continued cleaning the sump on the east end of the cell.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 6-27-08 S M T W T (F) S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 91,800 $ft^2$ of geocomposite. All geocomposite was deployed on the north end of the cell.

Field Seaming Activities: ESI joined all long seams with zip ties every 5'. All butt seams were joined with zip ties every 1' and textile was listerd on top of the seams.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading continued cleaning the sump on the east side of the cell.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 6-28-08 S M T W T F (S)

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 121,500 $ft^2$ of geocomposite. All of the geocomposite was deployed on the east side of the cell.

Field Seaming Activities: ESI joined all long seams with zip ties on the plastic portion. The textile on top was sewn together. All butt seams were also joined with zip ties on the plastic net portion and textile was listered on top.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading continued pumping out rain water and cleaning out dirt in the sump on the east side of the cell.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 6/30/08 S (M) T W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 5,400 ft$^2$ of geocomposite. All of the geocomposite was deployed on the north west portion of the tie in.

Field Seaming Activities: ESI joined all plastic net portions of geocomposite with zip ties. The textile portions of the long seams were sewn together. The butt seam got textile listered on top. All seaming met job specifications.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading continued cleaning the sump on the west side of the cell.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 7/1/08 S M (T) W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 72,900 ft² of geocomposite.

Field Seaming Activities: ESI joined all plastic net portions of geocomposite with plastic fasteners. The upper non-woven geotextile was continuously sewn. All seaming met job specifications.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading began building the temporary berm. They also continued cleaning out the sump on the west side of the cell.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 7/2/08 S M T (W) T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 135,000 ft² of geocomposite.

Field Seaming Activities: ESI joined all plastic net portions of geocomposite with plastic fasteners. The upper non-woven geotextile was continuously sewn. All seaming met job specifications.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Earnhardt Grading continued constructing the temporary berm. They also continued cleaning out the sump on the west side of the cell.

Submitted by: Pat Hulet
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 7/3/08 S M T W (T) F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI deployed approximatly 54,000 ft² of geocomposite. They also deployed liner for the temporary berm flap.

Field Seaming Activities: ESI joined all plastic net portions of geocomposite with plastic fasteners. The upper non-woven geotextile was continuously sewn. The temporary berm flap was fusion and extrusion welded. All seaming met job specifications.

Non-Destructive Testing: ESI vacuum tested all extrusion welded seams on the temporary berm flap.

Destructive Testing: None

General Remarks: Earnhardt Grading was not on site today.

Submitted by: [signature]
ACC Site Resident Manager

# Geosynthetic Installation Monitoring Report



Date: 7/4/08 S M T W T (F) S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: None

Field Seaming Activities: ESI continued extrusion welding the temporary berm flap.

Non-Destructive Testing: ESI vacuum tested all extrusion welded seams.

Destructive Testing: None

General Remarks: Earnhardt Grading was not on site today.

Submitted by: [signature]
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-14-08 S (M) T W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 69 @ am High: 85 @ pm
Cloud Cover: Mostly Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading started placing protective cover soil. The protective cover was placed in the NW corner of the cell.

Equipment used
- CAT 345 Hoe
- CAT 350 Hoe
- 6 CAT 740 Trucks
- 2 CAT D6 Dozers
- CAT Motor Grader
- Volvo Long reach
- Water Truck

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-14-08 S (M) T W T F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: [signature]
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-15-08 S M (T) W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 68 @ am High: 88 @ pm
Cloud Cover: partly cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading continued placing protective cover soil. All protective cover soil was placed on the north side of the cell. They also pumped out rain water from the sump on the east side of the cell.

Equipment Used
- CAT 345 Hoe
- CAT 350 Hoe
- 7 CAT 740 Trucks
- 2 CAT Dle Dozers
- CAT Motor Grader
- Volvo Long Reach
- Water Truck

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-15-08 S M (T) W T F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: [signature]
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-16-08 S M T (W) T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 67 @ am High: 89 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading continued placing protective cover soil. All protective cover soil was placed on the north east side of the cell. They also continued pumping out rain water from the sump on the east side of the cell.

Equipment Used
- CAT 345 Hoe
- CAT 350 Hoe
- 8 CAT 740 Trucks
- 2 CAT D6 Dozers
- Water Truck

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-16-08 S M T (W) T F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: [signature]
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-17-08 S M T W (T) F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 68 @ am High: 89 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 10-15

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading continued placing protective cover soil. The protective cover was placed on the south east corner of the cell. Plastic Fusion Fabricators arrived on site. They started fusing leachate collection pipe.

Equipment Used
- CAT 345 Hoe
- CAT 350 Hoe
- 8 CAT 740 Trucks
- 2 CAT D6 Dozers
- CAT Motor Grader
- Water Truck

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-17-08 S M T W (T) F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: Robert Hamilton
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-18-08 S M T W T (F) S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: ____ @ am High: ____ @ pm
Cloud Cover: ____ Precipitation: None Wind: ____

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading continued placing protective cover soil. The protective cover was placed on the south west side of the cell. Plastic Fusion Fabricators continued fusing leachate collection pipe.

Equipment Used
- CAT 345 Hoe
- CAT 350 Hoe
- 8 CAT 740 Trucks
- 2 CAT D6 Dozers
- CAT Motor Grader
- CAT 533 smooth Drum
- Water Truck

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-18-08 S M T W T (F) S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: Robt Hulton
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-21-08 S (M) T W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 74 @ am High: 96 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading and Plastic Fusion Fabricators installed the riser and leachate collection pipe on the east end of the cell. The sump was filled with No. 57 stone and wraped in Non-woven geotextile. Plastic Fusion did a pressure test on the pipe and it met job specifications. (The test was done on the Leachate force main.)

Equipment Used
- CAT 345 Hoe
- 3 CAT 740 Trucks
- CAT D6 Dozer
- CAT 950 Front End Loader
- CAT Motor Grader
- CAT Water Truck
- Volvo Long Reach

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-21-08 S (M) T W T F S

Summary of Surveyor's Activities: The surveyors did checks on the final grade. All areas met job specifications.

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: [signature]
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-22-08 S M (T) W T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 74 @ am High: 97 @ pm
Cloud Cover: Mostly Cloudy Precipitation: Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading and Plastic Fusion Fabricators installed the riser and leachate collection pipe on the west end of the cell. The sump and the leachate collection pipe were filled with No. 57 stone and wraped with non-woven geotextile.

Equipment Used
- CAT 345 Hoe
- 3 CAT 740 Trucks
- 2 CAT D6 Dozers
- CAT 950 Front End Loader
- CAT Motor Grader
- CAT Water Truck
- Volvo Long Reach

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-22-08 S M (T) W T F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: Pat Holt
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-23-08 S M T (W) T F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 72 @ am High: 90 @ pm
Cloud Cover: Mostly Cloudy Precipitation: Rain Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading continued the installation of the leachate collection pipe.

RAINED OUT !!

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-23-08 S M T (W) T F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: Rick Hulsta
ACC Site Resident Manager

# Daily Monitoring Summary



Date: 7-24-08 S M T W (T) F S

Project Number: A011.102
Project Title: CMS Landfill V Cell 2G
Location: Charlotte, North Carolina
Weather: Temperature: Low: 105 @ am High: 90 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: Earnhardt Grading completed installing the leachate collection pipe. Plastic Fusion Fabricators completed installing the last leachate force main on the west side of the cell. They did the pressure test on the force main and it met job specifications.

CELL COMPLETE !!

Equipment Used - CAT D6 Dozer
- CAT 950 Front End Loader
- Volvo Long Reach

ACC Activities and Test Results: Observed the activities noted above.

# Daily Monitoring Summary



Date: 7-24-08 S M T W (T) F S

Summary of Surveyor's Activities: None

Summary of Problems and Resolutions: None

Summary of Meetings and Discussions Held: None

Summary of Health and Safety Issues: None

Submitted by: Pat Hulett
ACC Site Resident Manager

of NORTH CAROLINA, PLLC

# APPENDIX D

## Conformance Test Results

of NORTH CAROLINA, PLLC

# SECTION D-1
# Geomembrane

# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 220723.08**
**TRI Log #: E2310-83-04**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 61 | 57 | 63 | 65 | 73 | 71 | 63 | 67 | 58 | 56 | **63** | 6 | 60 min avg |
| | | | | | | | | | | | **56** | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.947 | 0.947 | 0.947 | | | | | | | | **0.947** | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.53 | 2.47 | | | | | | | | | **2.50** | 0.04 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 140 | 160 | 181 | 159 | 143 | | | | | | **157** | 16 | 126 min |
| TD Yield Strength (ppi) | 153 | 163 | 172 | 182 | 205 | | | | | | **175** | 20 | 126 min |
| MD Break Strength (ppi) | 155 | 189 | 235 | 178 | 226 | | | | | | **197** | 33 | 90 min |
| TD Break Strength (ppi) | 152 | 162 | 169 | 171 | 176 | | | | | | **166** | 9 | 90 min |
| MD Yield Elongation (%) | 19 | 19 | 19 | 19 | 19 | | | | | | **19** | 0 | 12 min |
| TD Yield Elongation (%) | 19 | 15 | 17 | 17 | 17 | | | | | | **17** | 1 | 12 min |
| MD Break Elongation (%) | 441 | 474 | 480 | 455 | 451 | | | | | | **460** | 16 | 100 min |
| TD Break Elongation (%) | 503 | 581 | 496 | 508 | 514 | | | | | | **520** | 35 | 100 min |

MD Machine Direction TD Transverse Direction

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

# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 220733.08**
**TRI Log #: E2310-83-04**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 56 | 59 | 64 | 61 | 71 | 70 | 64 | 67 | 57 | 57 | 63 | 5 | 60 min avg |
| | | | | | | | | | | | 56 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.947 | 0.947 | 0.947 | | | | | | | | 0.947 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.76 | 2.76 | | | | | | | | | 2.76 | 0.00 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 150 | 150 | 174 | 191 | 174 | | | | | | 168 | 18 | 126 min |
| TD Yield Strength (ppi) | 165 | 164 | 182 | 199 | 190 | | | | | | 180 | 15 | 126 min |
| MD Break Strength (ppi) | 185 | 211 | 195 | 185 | 181 | | | | | | 191 | 12 | 90 min |
| TD Break Strength (ppi) | 160 | 149 | 119 | 147 | 139 | | | | | | 143 | 15 | 90 min |
| MD Yield Elongation (%) | 21 | 21 | 21 | 21 | 21 | | | | | | 21 | 0 | 12 min |
| TD Yield Elongation (%) | 17 | 15 | 17 | 17 | 17 | | | | | | 17 | 1 | 12 min |
| MD Break Elongation (%) | 424 | 443 | 429 | 390 | 430 | | | | | | 423 | 20 | 100 min |
| TD Break Elongation (%) | 556 | 534 | 204 | 435 | 381 | | | | | | 422 | 141 | 100 min |

MD Machine Direction TD Transverse Direction

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# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 221108.08**
**TRI Log #: E2310-83-04**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 71 | 76 | 67 | 64 | 64 | 66 | 61 | 58 | 62 | 58 | 65 | 6 | 60 min avg |
| | | | | | | | | | | | 58 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.946 | 0.946 | 0.946 | | | | | | | | 0.946 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.66 | 2.69 | | | | | | | | | 2.68 | 0.02 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 145 | 170 | 179 | 171 | 145 | | | | | | 162 | 16 | 126 min |
| TD Yield Strength (ppi) | 154 | 182 | 158 | 187 | 182 | | | | | | 173 | 15 | 126 min |
| MD Break Strength (ppi) | 192 | 227 | 198 | 223 | 207 | | | | | | 209 | 15 | 90 min |
| TD Break Strength (ppi) | 161 | 167 | 112 | 196 | 121 | | | | | | 151 | 35 | 90 min |
| MD Yield Elongation (%) | 20 | 20 | 20 | 20 | 20 | | | | | | 20 | 0 | 12 min |
| TD Yield Elongation (%) | 17 | 15 | 17 | 17 | 17 | | | | | | 17 | 1 | 12 min |
| MD Break Elongation (%) | 436 | 509 | 475 | 500 | 453 | | | | | | 475 | 31 | 100 min |
| TD Break Elongation (%) | 583 | 505 | 430 | 566 | 95 | | | | | | 436 | 200 | 100 min |

MD Machine Direction TD Transverse Direction

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# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 221118.08**
**TRI Log #: E2310-91-01**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 56 | 59 | 60 | 61 | 67 | 65 | 66 | 67 | 63 | 63 | 63 | 4 | 60 min avg |
| | | | | | | | | | | | 56 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.946 | 0.946 | 0.946 | | | | | | | | 0.946 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.80 | 2.87 | | | | | | | | | 2.84 | 0.05 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 164 | 163 | 146 | 138 | 157 | | | | | | 154 | 11 | 126 min |
| TD Yield Strength (ppi) | 181 | 178 | 159 | 144 | 164 | | | | | | 165 | 15 | 126 min |
| MD Break Strength (ppi) | 214 | 233 | 209 | 165 | 191 | | | | | | 202 | 26 | 90 min |
| TD Break Strength (ppi) | 170 | 164 | 144 | 109 | 142 | | | | | | 146 | 24 | 90 min |
| MD Yield Elongation (%) | 19 | 19 | 19 | 19 | 19 | | | | | | 19 | 0 | 12 min |
| TD Yield Elongation (%) | 17 | 17 | 17 | 17 | 17 | | | | | | 17 | 0 | 12 min |
| MD Break Elongation (%) | 465 | 460 | 491 | 493 | 453 | | | | | | 472 | 18 | 100 min |
| TD Break Elongation (%) | 485 | 505 | 471 | 235 | 448 | | | | | | 429 | 110 | 100 min |

MD Machine Direction TD Transverse Direction

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# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 221229.08**
**TRI Log #: E2310-91-01**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 58 | 56 | 57 | 59 | 65 | 67 | 68 | 70 | 66 | 62 | 63 | 5 | 60 min avg |
| | | | | | | | | | | | 56 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.944 | 0.944 | 0.944 | | | | | | | | 0.944 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.79 | 2.77 | | | | | | | | | 2.78 | 0.01 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 130 | 156 | 136 | 167 | 142 | | | | | | 146 | 15 | 126 min |
| TD Yield Strength (ppi) | 178 | 172 | 153 | 142 | 157 | | | | | | 160 | 15 | 126 min |
| MD Break Strength (ppi) | 164 | 237 | 200 | 195 | 179 | | | | | | 195 | 27 | 90 min |
| TD Break Strength (ppi) | 162 | 164 | 160 | 122 | 162 | | | | | | 154 | 18 | 90 min |
| MD Yield Elongation (%) | 21 | 21 | 21 | 21 | 21 | | | | | | 21 | 0 | 12 min |
| TD Yield Elongation (%) | 18 | 18 | 18 | 18 | 18 | | | | | | 18 | 0 | 12 min |
| MD Break Elongation (%) | 491 | 506 | 479 | 464 | 468 | | | | | | 482 | 18 | 100 min |
| TD Break Elongation (%) | 479 | 518 | 574 | 471 | 523 | | | | | | 513 | 41 | 100 min |

MD Machine Direction TD Transverse Direction

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# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 221240.08**
**TRI Log #: E2310-88-03**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 63 | 65 | 67 | 66 | 71 | 70 | 62 | 65 | 60 | 63 | 65 | 3 | 60 min avg |
| | | | | | | | | | | | 60 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.944 | 0.944 | 0.944 | | | | | | | | 0.944 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.33 | 2.32 | | | | | | | | | 2.33 | 0.01 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 141 | 167 | 162 | 139 | 140 | | | | | | 150 | 14 | 126 min |
| TD Yield Strength (ppi) | 149 | 184 | 173 | 161 | 149 | | | | | | 163 | 15 | 126 min |
| MD Break Strength (ppi) | 173 | 229 | 231 | 207 | 171 | | | | | | 202 | 29 | 90 min |
| TD Break Strength (ppi) | 148 | 196 | 153 | 134 | 156 | | | | | | 157 | 23 | 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 (%) | 445 | 478 | 494 | 449 | 515 | | | | | | 476 | 30 | 100 min |
| TD Break Elongation (%) | 465 | 608 | 453 | 485 | 519 | | | | | | 506 | 62 | 100 min |

MD Machine Direction TD Transverse Direction

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# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 221350.08**
**TRI Log #: E2310-90-10**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 60 | 64 | 68 | 69 | 66 | 67 | 59 | 66 | 54 | 55 | 63 | 5 | 60 min avg |
| | | | | | | | | | | | 54 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.943 | 0.943 | 0.943 | | | | | | | | 0.943 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.07 | 2.07 | | | | | | | | | 2.07 | 0.00 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 152 | 163 | 145 | 135 | 136 | | | | | | 146 | 12 | 126 min |
| TD Yield Strength (ppi) | 145 | 159 | 175 | 171 | 146 | | | | | | 159 | 14 | 126 min |
| MD Break Strength (ppi) | 206 | 187 | 206 | 192 | 171 | | | | | | 192 | 15 | 90 min |
| TD Break Strength (ppi) | 151 | 117 | 153 | 120 | 144 | | | | | | 137 | 17 | 90 min |
| MD Yield Elongation (%) | 20 | 20 | 20 | 20 | 20 | | | | | | 20 | 0 | 12 min |
| TD Yield Elongation (%) | 17 | 17 | 17 | 17 | 17 | | | | | | 17 | 0 | 12 min |
| MD Break Elongation (%) | 456 | 450 | 473 | 419 | 503 | | | | | | 460 | 31 | 100 min |
| TD Break Elongation (%) | 539 | 396 | 454 | 69 | 476 | | | | | | 387 | 185 | 100 min |

MD Machine Direction TD Transverse Direction

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# GEOMEMBRANE TEST RESULTS

**TRI Client: Atlantic Coast Company**
**Project: Charlotte Motor Speedway**

**Material: Agru 60 mil Microspike HDPE Geomembrane**
**Sample Identification: 221361.08**
**TRI Log #: E2310-90-10**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thickness (ASTM D 5994)** | | | | | | | | | | | | | |
| Thickness (mils) | 57 | 59 | 63 | 64 | 68 | 68 | 66 | 69 | 64 | 62 | 64 | 4 | 60 min avg |
| | | | | | | | | | | | 57 | << min | 54 min |
| **Density (ASTM D 1505)** | | | | | | | | | | | | | |
| Density (g/cm3) | 0.945 | 0.945 | 0.945 | | | | | | | | 0.945 | 0.000 | 0.940 min |
| **Carbon Black Content (ASTM D 1603, mod.)** | | | | | | | | | | | | | |
| % Carbon Black | 2.65 | 2.66 | | | | | | | | | 2.66 | 0.01 | 2% - 3% |
| **Carbon Black Dispersion (ASTM D 5596)** | | | | | | | | | | | | | |
| Rating - 1st field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 9 Cat 1 or 2 |
| Rating - 2nd field view | 1 | 1 | 1 | 1 | 1 | | | | | | | | 1 Cat 3 |
| **Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)** | | | | | | | | | | | | | |
| MD Yield Strength (ppi) | 139 | 154 | 171 | 164 | 139 | | | | | | 153 | 14 | 126 min |
| TD Yield Strength (ppi) | 164 | 147 | 179 | 176 | 156 | | | | | | 164 | 13 | 126 min |
| MD Break Strength (ppi) | 131 | 208 | 204 | 209 | 217 | | | | | | 194 | 35 | 90 min |
| TD Break Strength (ppi) | 154 | 142 | 173 | 169 | 158 | | | | | | 159 | 12 | 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 (%) | 354 | 468 | 493 | 429 | 465 | | | | | | 442 | 54 | 100 min |
| TD Break Elongation (%) | 483 | 456 | 483 | 503 | 556 | | | | | | 496 | 37 | 100 min |

MD Machine Direction TD Transverse Direction

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# SECTION D-2

## Geosynthetic Clay Liner

# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5596**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.96 | 1.06 | 1.05 | 0.95 | 1.12 | | | | | | **1.03** | 0.07 | 0.75 min |
| Moisture Content (%) | 27.9 | 26.4 | 28.3 | 28.6 | 26.5 | | | | | | **27.5** | 1.0 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 11.5 | 12.4 | 12.3 | 12.0 | 10.9 | | | | | | **11.8** | 0.6 | 2.5 min |
| **Hydraulic Conductivity (ASTM D 5084)** | | | | | | | | | | | | | |
| Hydraulic Conductivity (cm/sec) | 3.0E-09 | | | | | | | | | | **3.0E-09** | | 5E-09 max |

MD Machine Direction TD Transverse Direction

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# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5641**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.89 | 1.02 | 0.91 | 0.88 | 0.91 | | | | | | **0.92** | 0.06 | 0.75 min |
| Moisture Content (%) | 28.3 | 26.7 | 27.7 | 28.9 | 29.3 | | | | | | **28.2** | 1.0 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 10.8 | 7.9 | 9.3 | 8.3 | 7.5 | | | | | | **8.8** | 1.3 | 2.5 min |

MD Machine Direction TD Transverse Direction

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# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5685**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.88 | 0.90 | 0.95 | 0.88 | 0.95 | | | | | | **0.91** | 0.04 | 0.75 min |
| Moisture Content (%) | 28.2 | 27.6 | 28.9 | 30.1 | 28.3 | | | | | | **28.6** | 0.9 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 13.1 | 12.1 | 8.1 | 10.8 | 13.2 | | | | | | **11.5** | 2.1 | 2.5 min |
| **Hydraulic Conductivity (ASTM D 5084)** | | | | | | | | | | | | | |
| Hydraulic Conductivity (cm/sec) | 2.7E-09 | | | | | | | | | | **2.7E-09** | | 5E-09 max |

MD Machine Direction TD Transverse Direction

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# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5729**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.91 | 0.91 | 0.98 | 0.87 | 0.96 | | | | | | **0.93** | 0.04 | 0.75 min |
| Moisture Content (%) | 25.3 | 28.2 | 28.7 | 29.9 | 29.9 | | | | | | **28.4** | 1.9 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 10.0 | 9.6 | 10.1 | 10.0 | 11.4 | | | | | | **10.2** | 0.7 | 2.5 min |

MD Machine Direction TD Transverse Direction

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# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5773**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.83 | 0.98 | 0.94 | 0.85 | 0.88 | | | | | | **0.90** | 0.06 | 0.75 min |
| Moisture Content (%) | 27.8 | 27.4 | 28.5 | 31.5 | 29.9 | | | | | | **29.0** | 1.7 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 14.4 | 14.7 | 12.1 | 12.7 | 12.3 | | | | | | **13.2** | 1.2 | 2.5 min |

MD Machine Direction TD Transverse Direction

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# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5817**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.87 | 0.84 | 0.96 | 0.85 | 0.98 | | | | | | **0.90** | 0.07 | 0.75 min |
| Moisture Content (%) | 27.9 | 29.1 | 29.3 | 29.8 | 29.2 | | | | | | **29.1** | 0.7 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 7.9 | 7.1 | 8.8 | 8.2 | 10.5 | | | | | | **8.5** | 1.3 | 2.5 min |
| **Hydraulic Conductivity (ASTM D 5084)** | | | | | | | | | | | | | |
| Hydraulic Conductivity (cm/sec) | 1.4E-09 | | | | | | | | | | **1.4E-09** | | 5E-09 max |

MD Machine Direction TD Transverse Direction

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# GCL TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Sample Identification: 5861**
**TRI Log #: E2308-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bentonite - Mass/Unit Area (ASTM D 5993, result @ 0% M.C.)** | | | | | | | | | | | | | |
| Bentonite mass/unit area (lbs/ft$^2$) | 0.89 | 0.95 | 1.01 | 0.91 | 0.98 | | | | | | **0.95** | 0.05 | 0.75 min |
| Moisture Content (%) | 30.4 | 27.5 | 29.3 | 30.1 | 27.3 | | | | | | **28.9** | 1.4 | |
| **Peel Strength (ASTM D 6496)** | | | | | | | | | | | | | |
| MD - Peel Strength (lbs/in) | 10.7 | 10.0 | 9.3 | 8.8 | 8.9 | | | | | | **9.5** | 0.8 | 2.5 min |

MD Machine Direction TD Transverse Direction

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of NORTH CAROLINA, PLLC

# SECTION D-3

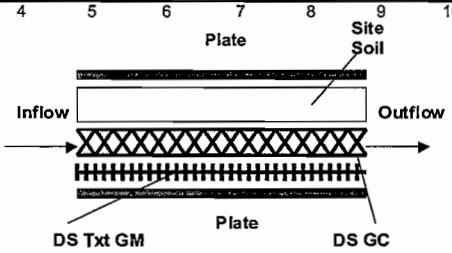
## Geocomposite

# GEOCOMPOSITE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Agru Double Sided Geocomposite**
**Sample Identification: 526273.08**
**TRI Log #: E2312-47-07**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydraulic Transmissivity (ASTM D 4716)** | | | | | | | | | | | | | |
| Direction Tested: Machine Direction | | | | | | | | | | | | | |
| Normal Load (psf): | 10,000 | | | | | | | | | | | | |
| Hydraulic Gradient: | 0.25 | | | | | | | | | | | | |
| Test Length (in) | 12 | | | | | | | | | | | | |
| Test Width (in) | 12 | | | | | | | | | | | | |
| Plate / Site Soil / Sample / Agru 60 mil Microspike Geomembrane / Plate | | | | | | | | | | | | | |
| Seat Time (hours) | Specimen | | 1 | | | | | | | | | | |
| Volume (cc) | | 622 | 616 | 628 | | | | | | | | | |
| Time (s) | | 30.06 | 29.84 | 30.25 | | | | | | | | | |
| 24 Flow Rate (GPM/ft width) | | 0.33 | 0.33 | 0.33 | | | | | | | 0.33 | 0.00 | |
| 24 Transmissivity (m^2/s) | | 2.72E-04 | 2.71E-04 | 2.72E-04 | | | | | | | 2.72E-04 | 7.71E-07 | 5.0E-4 min |
| Test Temp (C) | | | 20.0 | | | | | | | | | | |
| Temp. Corr. Factor | | | 1.000 | | | | | | | | | | |
| **Peel Strength (ASTM F 904, mod.)** | | | | | | | | | | | | | |
| A - MD Average Peel Strength (ppi) | 0.7 | 4.4 | 4.5 | 2.2 | 2.5 | | | | | | 2.9 | 1.6 | |
| A - MD Average Peel Strength (g/in) | 318 | 1998 | 2043 | 999 | 1135 | | | | | | 1298 | 728 | 150 min |
| B - MD Average Peel Strength (ppi) | 6.7 | 1.2 | 3.5 | 5.3 | 1.9 | | | | | | 3.7 | 2.3 | |
| B - MD Average Peel Strength (g/in) | 3042 | 545 | 1589 | 2406 | 863 | | | | | | 1689 | 1042 | 150 min |




Note: A and B represent a randomly assigned top and bottom of the sample

MD Machine Direction TD Transverse Direction

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: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Agru Double Sided Geocomposite**
**Sample Identification: 526457.08**
**TRI Log #: E2312-47-07**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydraulic Transmissivity (ASTM D 4716)** | | | | | | | | | | | | | |

Direction Tested: Machine Direction

| | |
|---|---|
| Normal Load (psf): | 10,000 |
| Hydraulic Gradient: | 0.25 |
| Test Length (in) | 12 |
| Test Width (in) | 12 |

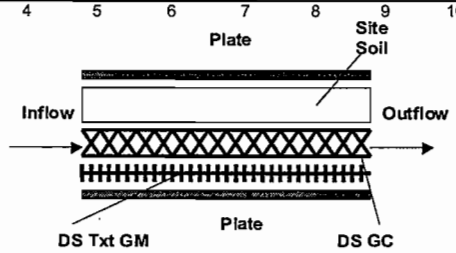


Plate / Site Soil / Sample / Agru 60 mil Microspike Geomembrane / Plate

| Seat Time (hours) | | Specimen | 1 | | | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| | Volume (cc) | | 597 | 603 | 605 | | | |
| | Time (s) | | 30.15 | 30.37 | 30.40 | | | |
| 24 | Flow Rate (GPM/ft width) | | 0.31 | 0.31 | 0.32 | 0.31 | 0.00 | ✓ |
| | Transmissivity (m^2/s) | | 2.60E-04 | 2.61E-04 | 2.61E-04 | 2.61E-04 | 6.59E-07 | 5.0E-4 min |
| | Test Temp (C) | | | 20.0 | | | | |
| | Temp. Corr. Factor | | | 1.000 | | | | |

**Peel Strength (ASTM F 904, mod.)**

| | 1 | 2 | 3 | 4 | 5 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| A - MD Average Peel Strength (ppi) | 4.7 | 3.7 | 3.1 | 1.4 | 4.7 | 3.5 | 1.4 | |
| A - MD Average Peel Strength (g/in) | 2134 | 1680 | 1407 | 636 | 2134 | 1598 | 621 | 150 min ✓ |
| B - MD Average Peel Strength (ppi) | 6.0 | 6.0 | 2.1 | 0.4 | 1.6 | 3.2 | 2.6 | |
| B - MD Average Peel Strength (g/in) | 2724 | 2724 | 953 | 182 | 726 | 1462 | 1186 | 150 min |

Note: A and B represent a randomly assigned top and bottom of the sample

MD Machine Direction TD Transverse Direction

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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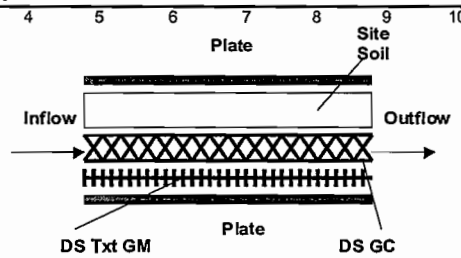
# GEOCOMPOSITE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway**

**Material: Agru Double Sided Geocomposite**
**Sample Identification: 526537.08**
**TRI Log #: E2312-50-06**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydraulic Transmissivity (ASTM D 4716)** | | | | | | | | | | | | | |
| Direction Tested: Machine Direction | | | | | | | | | | | | | |
| Normal Load (psf): | 10,000 | | | | | | | | | | | | |
| Hydraulic Gradient: | 0.25 | | | | | | | | | | | | |
| Test Length (in) | 12 | | | | | | | | | | | | |
| Test Width (in) | 12 | | | | | | | | | | | | |
| Plate / Site Soil / Sample / Agru 60 mil Microspike Geomembrane / Plate | | | | | | | | | | | | | |
| Seat Time (hours) | Specimen | | 1 | | | | | | | | | | |
| Volume (cc) | | 538 | 641 | 536 | | | | | | | | | |
| Time (s) | | 30.25 | 36.06 | 30.15 | | | | | | | | | |
| 24 Flow Rate (GPM/ft width) | | 0.28 | 0.28 | 0.28 | | | | | | | 0.28 | 0.00 | ✓ |
| 24 Transmissivity (m^2/s) | | 2.33E-04 | 2.33E-04 | 2.33E-04 | | | | | | | 2.33E-04 | 6.38E-08 | 5.0E-4 min |
| Test Temp (C) | | | 20.0 | | | | | | | | | | |
| Temp. Corr. Factor | | | 1.000 | | | | | | | | | | |
| **Peel Strength (ASTM F 904, mod.)** | | | | | | | | | | | | | |
| A - MD Average Peel Strength (ppi) | 10.1 | 9.5 | 5.9 | 3.1 | 7.0 | | | | | | 7.1 | 2.8 | |
| A - MD Average Peel Strength (g/in) | 4585 | 4313 | 2679 | 1407 | 3178 | | | | | | 3232 | 1288 | 150 min ✓ |
| B - MD Average Peel Strength (ppi) | 8.3 | 11.0 | 5.7 | 3.7 | 2.2 | | | | | | 6.2 | 3.5 | |
| B - MD Average Peel Strength (g/in) | 3768 | 4994 | 2588 | 1680 | 999 | | | | | | 2806 | 1604 | 150 min |




Note: A and B represent a randomly assigned top and bottom of the sample

MD Machine Direction TD Transverse Direction

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# SECTION D-4

## Geotextile

# GEOTEXTILE TEST RESULTS

**TRI Client:**
**Project: Charlotte Motor Speedway**

**Material: 8 oz. Nonwoven Geotextile**
**Sample Identification: GT-180**
**TRI Log #: E2312-60-01**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mass/Unit Area (ASTM D 5261)** | | | | | | | | | | | | |
| 5" diameter circle (grams) | 3.67 | 3.60 | 4.33 | 3.47 | 3.70 | 3.63 | 3.43 | 3.35 | 3.53 | 4.60 | **3.73** | 0.41 |
| Mass/Unit Area (oz/sq.yd) | 8.54 | 8.37 | 10.07 | 8.07 | 8.61 | 8.44 | 7.98 | 7.79 | 8.21 | 10.70 | **8.68** | 0.95 |
| **Grab Tensile Properties (ASTM D 4632)** | | | | | | | | | | | | |
| MD - Tensile Strength (lbs) | 275 | 230 | 352 | 250 | 304 | 344 | 244 | 235 | 217 | 217 | **267** | 50 |
| TD - Tensile Strength (lbs) | 273 | 280 | 264 | 266 | 265 | 269 | 261 | 273 | 295 | 266 | **271** | 10 |
| MD - Elong. @ Max. Load (%) | 67 | 67 | 69 | 73 | 75 | 65 | 66 | 66 | 65 | 65 | **68** | 4 |
| TD - Elong. @ Max. Load (%) | 81 | 74 | 94 | 79 | 77 | 90 | 73 | 81 | 78 | 73 | **80** | 7 |
| **Puncture Resistance (ASTM D 4833)** | | | | | | | | | | | | |
| Puncture Strength (lbs) | 136 | 122 | 157 | 110 | 135 | 111 | 133 | 170 | 144 | 149 | **140** | 19 |
| | 166 | 152 | 155 | 117 | 148 | | | | | | | |
| **Trapezoidal Tear (ASTM D 4533)** | | | | | | | | | | | | |
| MD - Tear Strength (lbs) | 102 | 92 | 142 | 76 | 83 | 71 | 92 | 77 | 72 | 116 | **92** | 23 |
| TD - Tear Strength (lbs) | 112 | 101 | 102 | 100 | 108 | 124 | 90 | 84 | 101 | 106 | **103** | 11 |

MD Machine Direction TD Transverse Direction

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 E

## Manufacturer's Quality Control Certificates

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# SECTION E-1

## Geomembrane

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# quality certificate

ROLL # **220723-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.93 | mm | 76 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.62 | mm | 64 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |
| OIT(Standard) ASTM D3895 minutes | 166 | |

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.68 | |
| 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 | 156 | ppi | 2,449 | psi |
| | Average Strength @ Break | 31 | N/mm | 177 | ppi | 2,771 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 16.45 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 509.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: H. Holmes
Quality Control Department

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quality control dept.

# quality certificate

ROLL # **220724-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| | AVE: | 1.60 | mm | 63 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 32 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | | 2.68 | |
| 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 | 154 | ppi | | | 2,449 | psi |
| | Average Strength @ Break | 31 | N/mm | 175 | ppi | | | 2,771 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | | 16.45 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | | 509.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-18-08**

Signature: H Holmes
Quality Control Department

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# quality certificate

ROLL # **220725-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.39 | mm | 55 | mil |
| | MAX: | 1.76 | mm | 69 | mil |
| Asperity GRI GM12: 24 mil | AVE: | 1.53 | mm | 60 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | **TEST RESULTS** |
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.68 |
| 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 | 148 | ppi | 2,449 | psi |
| | Average Strength @ Break | 29 | N/mm | 167 | ppi | 2,771 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Yield | | % | | | 16.45 | |
| | Average Elongation @ Break | | % | | | 509.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **220726-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 31 mil | AVE: | 1.61 | mm | 63 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.68 | |
| 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 | 155 | ppi | | 2,449 | psi |
| | Average Strength @ Break | 31 | N/mm | 176 | ppi | | 2,771 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 16.45 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 509.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-18-08**

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **220727-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.41 | mm | 56 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| Asperity GRI GM12: 25 mil | AVE: | 1.61 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.68 | |
| 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 | 155 | ppi | | 2,449 | psi |
| | Average Strength @ Break | 31 | N/mm | 176 | ppi | | 2,771 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 16.45 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 509.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature

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# quality certificate

ROLL # **220728-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 22 mil | AVE: | 1.59 | mm | 63 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .17 | |
| 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 | 27 | N/mm | 157 | ppi | | 2,501 | psi |
| | Average Strength @ Break | 30 | N/mm | 174 | ppi | | 2,782 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 17.68 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 496.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: H Holmes
Quality Control Department

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# quality certificate

ROLL # **220729-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| Measurement ASTM D5994 (Modified) | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.88 | mm | 74 | mil |
| | AVE: | 1.63 | mm | 64 | mil |

Thickness..... 1.5 mm 60 mil
Length..... 125 m 410.1 feet
Width..... 7.00 m; 23.0 feet

Asperity GRI GM12: 24 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | TEST RESULTS |
|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | .17 |
| 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 | 160 ppi | 2,501 psi |
| | Average Strength @ Break | 31 | N/mm | 179 ppi | 2,782 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | 17.68 |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | 496.5 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | -0.16 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | 54.771 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | 90.959 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | 126.62 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature.....
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# quality certificate

ROLL # **220730-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 31 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| 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 | 160 | ppi | 2,501 | psi |
| | Average Strength @ Break | 31 | N/mm | 179 | ppi | 2,782 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.68 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 496.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: [signature]
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# quality certificate

ROLL # **220731-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.63 | mm | 64 | mil |
| | AVE: | 1.54 | mm | 61 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 28 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| 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 | 27 | N/mm | 152 | ppi | | | 2,501 | psi |
| | Average Strength @ Break | 30 | N/mm | 169 | ppi | | | 2,782 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | | 17.68 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | | 496.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature.....

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# quality certificate

ROLL # **220732-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 29 mil | AVE: | 1.63 | mm | 64 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | TEST RESULTS |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .17 |
| 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 | 160 | ppi | 2,501 | psi |
| | Average Strength @ Break | 31 | N/mm | 179 | ppi | 2,782 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.68 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 496.5 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 243.6 | N | | | 54.771 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 404.6 | N | | | 90.959 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 563.2 | N | | | 126.62 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-18-08**

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **220733-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| Measurement ASTM D5994 (Modified) | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.80 | mm | 71 | mil |
| | AVE: | 1.63 | mm | 64 | mil |

Thickness..... 1.5 mm 60 mil
Length..... 125 m 410.1 feet
Width..... 7.00 m; 23.0 feet

Asperity GRI GM12: 27 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | TEST RESULTS |
|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | .17 |
| Carbon Black Content ASTM D4218 | Range | % | | | 2.81 |
| 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 | 164 ppi | | 2,556 psi |
| | Average Strength @ Break | 33 N/mm | 188 ppi | | 2,935 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 | % | | | 499.1 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | -0.16 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 266.3 N | | | 59.873 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 N | | | 99.373 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 641.7 N | | | 144.26 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **220734-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| Measurement ASTM D5994 (Modified) | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.78 | mm | 70 | mil |
| Asperity GRI GM12: 30 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.81 | |
| 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 | 164 | ppi | 2,556 | psi |
| | Average Strength @ Break | 33 | N/mm | 188 | ppi | 2,935 | 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 | % | | | | 499.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 266.3 | N | | | 59.873 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | 99.373 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 641.7 | N | | | 144.26 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **220735-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.81 | mm | 71 | mil |
| Asperity GRI GM12: 29 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | | 2.81 | |
| 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 | 164 | ppi | | | 2,556 | psi |
| | Average Strength @ Break | 33 | N/mm | 188 | ppi | | | 2,935 | 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 | | % | | | | | 499.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 266.3 | N | | | | | 59.873 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | | 99.373 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 641.7 | N | | | | | 144.26 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-18-08

Signature: H. Holmes

Quality Control Department

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# quality certificate

ROLL # **220740-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.42 | mm | 56 | mil |
| | MAX: | 1.70 | mm | 67 | mil |
| Asperity GRI GM12: 28 mil | AVE: | 1.54 | mm | 61 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| 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 | 152 | ppi | 2,511 | psi |
| | Average Strength @ Break | 29 | N/mm | 163 | ppi | 2,693 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.58 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 465.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 266.3 | N | | | 59.873 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | 99.373 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 641.7 | N | | | 144.26 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-18-08**

Signature: H Holmes
Quality Control Department

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# quality certificate

ROLL # **221101-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| Measurement ASTM D5994 (Modified) | MIN: | 1.41 | mm | 56 | mil |
| | MAX: | 1.69 | mm | 67 | mil |
| | AVE: | 1.57 | mm | 62 | mil |

Thickness..... 1.5 mm 60 mil
Length..... 125 m 410.1 feet
Width..... 7.00 m; 23.0 feet

Asperity GRI GM12: 24 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | TEST RESULTS |
|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | .17 |
| 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 | 155 ppi | 2,511 psi |
| | Average Strength @ Break | 29 | N/mm | 166 ppi | 2,693 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | 17.58 |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | 465.6 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | -0.16 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 266.3 | N | | 59.873 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | 99.373 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 641.7 | N | | 144.26 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature.....
Quality Control Department

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# quality certificate

ROLL # **221102-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| Measurement ASTM D5994 (Modified) | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 32 mil | AVE: | 1.60 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | .17 | |
| 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 | 158 ppi | 2,511 | psi |
| | Average Strength @ Break | 30 | N/mm | 170 ppi | 2,693 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | 17.58 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | 465.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 266.3 | N | | 59.873 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | 99.373 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 641.7 | N | | 144.26 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature.....

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# quality certificate

ROLL # **221103-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.45 | mm | 57 | mil |
| | MAX: | 1.76 | mm | 69 | mil |
| Asperity GRI GM12: 24 mil | AVE: | 1.58 | mm | 62 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | | 2.58 | |
| 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 | 153 | ppi | | | 2,464 | psi |
| | Average Strength @ Break | 31 | N/mm | 175 | ppi | | | 2,813 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | | 16.63 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | | 505.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H Holmes

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# quality certificate

ROLL # **221104-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.42 | mm | 56 | mil |
| | MAX: | 1.76 | mm | 69 | mil |
| | AVE: | 1.58 | mm | 62 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 24 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.58 | |
| 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 | 153 | ppi | | 2,464 | psi |
| | Average Strength @ Break | 31 | N/mm | 175 | ppi | | 2,813 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 16.63 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 505.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H Holmes
Quality Control Department

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ROLL # **221105-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.81 | mm | 71 | mil |
| Asperity GRI GM12: 23 mil | AVE: | 1.62 | mm | 64 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | | 2.58 | |
| 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 | 157 | ppi | | | 2,464 | psi |
| | Average Strength @ Break | 31 | N/mm | 179 | ppi | | | 2,813 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | | 16.63 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | | 505.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-19-08**

Signature: H Holmes
Quality Control Department

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ROLL # 221106-08 Lot #: MM200319 **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.83 | mm | 72 | mil |
| | AVE: | 1.64 | mm | 65 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 32 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | | 2.58 | |
| 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 | 159 | ppi | 2,464 | psi | | |
| | Average Strength @ Break | 32 | N/mm | 182 | ppi | 2,813 | psi | | |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 16.63 | | | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 505.3 | | | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | | | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | 55.314 | lbs | | |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | 106.73 | lbs | | |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H Holmes
Quality Control Department

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ROLL # **221107-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.41 | mm | 56 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 24 mil | AVE: | 1.61 | mm | 63 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.58 | |
| 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 | 156 | ppi | 2,464 | psi |
| | Average Strength @ Break | 31 | N/mm | 178 | ppi | 2,813 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 16.63 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 505.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-19-08**

Signature.....

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ROLL # **221108-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.38 | mm | 54 | mil |
| | MAX: | 1.71 | mm | 67 | mil |
| Asperity GRI GM12: 32 mil | AVE: | 1.58 | mm | 62 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.84 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 in Cat. 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) | Average Strength @ Yield | 25 | N/mm | 143 | ppi | | 2,293 | psi |
| | Average Strength @ Break | 29 | N/mm | 166 | ppi | | 2,668 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.90 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 505.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-19-08**

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **221109-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.45 | mm | 57 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 20 mil | AVE: | 1.62 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil | |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | ,949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | 2.84 | |
| 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 | 146 ppi | 2,293 | psi |
| | Average Strength @ Break | 30 | N/mm | 170 ppi | 2,668 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | 17.90 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | 505.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **221110-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.48 | mm | 58 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| | AVE: | 1.62 | mm | 64 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 31 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.84 | |
| 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 | 146 | ppi | | 2,293 | psi |
| | Average Strength @ Break | 30 | N/mm | 170 | ppi | | 2,668 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 17.90 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 505.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **221111-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.78 | mm | 70 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.64 | mm | 65 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.84 | |
| 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 | 148 | ppi | | 2,293 | psi |
| | Average Strength @ Break | 30 | N/mm | 172 | ppi | | 2,668 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.90 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 505.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H. Holmes

Quality Control Department

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# quality certificate

ROLL # **221112-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.45 | mm | 57 | mil |
| | MAX: | 1.80 | mm | 71 | mil |
| | AVE: | 1.64 | mm | 65 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 30 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.84 | |
| 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 | 148 | ppi | | 2,293 | psi |
| | Average Strength @ Break | 30 | N/mm | 172 | ppi | | 2,668 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.90 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 505.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 246.0 | N | | | | 55.314 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 474.7 | N | | | | 106.73 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 593.4 | N | | | | 133.39 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-19-08**

Signature.....

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# quality certificate

ROLL # **221113-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.51 | mm | 59 | mil |
| | MAX: | 1.69 | mm | 67 | mil |
| Asperity GRI GM12: 28 mil | AVE: | 1.55 | mm | 61 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| 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 | 27 | N/mm | 152 | ppi | | | 2,488 | psi |
| | Average Strength @ Break | 30 | N/mm | 172 | ppi | | | 2,826 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | | 16.44 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | | 507.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-19-08**

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **221114-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| Measurement ASTM D5994 (Modified) | MIN: | 1.51 | mm | 59 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| Asperity GRI GM12: 32 mil | AVE: | 1.66 | mm | 65 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | .17 | |
| 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 | 28 | N/mm | 163 | ppi | 2,488 | psi |
| | Average Strength @ Break | 32 | N/mm | 185 | ppi | 2,826 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | 16.44 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | 507.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **221115-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| Asperity GRI GM12: 27 mil | AVE: | 1.65 | mm | 65 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| 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 | 28 | N/mm | 162 | ppi | 2,488 | psi |
| | Average Strength @ Break | 32 | N/mm | 184 | ppi | 2,826 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 16.44 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H Holmes
Quality Control Department

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ROLL # **221116-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.40 | mm | 55 | mil |
| | MAX: | 1.76 | mm | 69 | mil |
| Asperity GRI GM12: 29 mil | AVE: | 1.59 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| 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 | 27 | N/mm | 156 | ppi | 2,488 | psi |
| | Average Strength @ Break | 31 | N/mm | 177 | ppi | 2,826 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 16.44 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **221117-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil |
| | MAX: | 1.88 | mm | 74 | mil |
| Asperity GRI GM12: 24 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| 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 | 28 | N/mm | 160 | ppi | 2,488 | psi |
| | Average Strength @ Break | 32 | N/mm | 181 | ppi | 2,826 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 16.44 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **221118-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.76 | mm | 69 | mil |
| | AVE: | 1.60 | mm | 63 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 31 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | | 2.51 | |
| 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 | 151 | ppi | | | 2,402 | psi |
| | Average Strength @ Break | 29 | N/mm | 166 | ppi | | | 2,631 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | | 17.22 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | | 469.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature:

Quality Control Department

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# quality certificate

ROLL # **221119-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.50 | mm | 59 | mil |
| | MAX: | 1.73 | mm | 68 | mil |
| Asperity GRI GM12: 24 mil | AVE: | 1.61 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.51 | |
| 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 | 152 | ppi | 2,402 | psi |
| | Average Strength @ Break | 29 | N/mm | 167 | ppi | 2,631 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.22 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 469.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-19-08

Signature: H Holmes
Quality Control Department

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ROLL # **221220-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | ENGLISH |
|---|---|---|---|
| | MIN: | 1.46 mm | 57 mil |
| | MAX: | 1.81 mm | 71 mil |
| Asperity GRI GM12: 25 mil | AVE: | 1.64 mm | 65 mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 mm | 60 mil | |
| Length..... | 125 m | 410.1 feet | |
| Width..... | 7.00 m; | 23.0 feet | |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | TEST RESULTS |
|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | .17 |
| Carbon Black Content ASTM D4218 | Range | % | | 2.51 |
| 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 | 155 ppi | 2,402 psi |
| | Average Strength @ Break | 30 N/mm | 170 ppi | 2,631 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | 17.22 |
| Lo = 2.0" Break | Average Elongation @ Break | % | | 469.1 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | -0.16 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 N | | 57.802 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 N | | 85.933 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 N | | 133.23 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **221221-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | | Thickness..... | 1.5 mm | 60 mil |
|---|---|---|---|---|---|---|---|---|
| | MIN: | 1.42 | mm | 56 | mil | Length..... | 125 m | 410.1 feet |
| | MAX: | 1.81 | mm | 71 | mil | Width..... | 7.00 m; | 23.0 feet |
| Asperity GRI GM12: 25 mil | AVE: | 1.65 | mm | 65 | mil | OIT(Standard) ASTM D3895 minutes | 166 | |

ODD # : TOP EVEN #: BOTTOM

| | | | | TEST RESULTS |
|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | .17 |
| Carbon Black Content ASTM D4218 | Range | % | | 2.51 |
| 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 | 156 ppi | 2,402 psi |
| | Average Strength @ Break | 30 N/mm | 171 ppi | 2,631 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | 17.22 |
| Lo = 2.0" Break | Average Elongation @ Break | % | | 469.1 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | -0.16 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 N | | 57.802 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 N | | 85.933 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 N | | 133.23 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes

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ROLL # **221222-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.57 | mm | 62 | mil |
| | MAX: | 1.74 | mm | 69 | mil |
| Asperity GRI GM12: 33 mil | AVE: | 1.65 | mm | 65 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |
| OIT(Standard) ASTM D3895 | minutes | 166 | |

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.51 | |
| 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 | 156 | ppi | | 2,402 | psi |
| | Average Strength @ Break | 30 | N/mm | 171 | ppi | | 2,631 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.22 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 469.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.1 | N | | | | 57.802 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 382.2 | N | | | | 85.933 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 592.6 | N | | | | 133.23 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes

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ROLL # **221223-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.53 | mm | 60 | mil |
| | MAX: | 1.86 | mm | 73 | mil |
| Asperity GRI GM12: 27 mil | AVE: | 1.70 | mm | 67 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | TEST RESULTS |
|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | .17 |
| Carbon Black Content ASTM D4218 | Range | % | | 2.70 |
| 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 | 160 ppi | 2,395 psi |
| | Average Strength @ Break | 32 N/mm | 181 ppi | 2,699 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | 17.03 |
| Lo = 2.0" Break | Average Elongation @ Break | % | | 485.7 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | -0.16 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 N | | 54.395 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 N | | 89.063 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 N | | 133.85 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: [signature]
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ROLL # **221224-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.48 | mm | 58 | mil |
| | MAX: | 1.72 | mm | 68 | mil |
| | AVE: | 1.59 | mm | 63 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 38 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | | 2.70 | |
| 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 | 150 | ppi | | | 2,395 | psi |
| | Average Strength @ Break | 30 | N/mm | 169 | ppi | | | 2,699 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | | 17.03 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | | 485.7 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes
Quality Control Department

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ROLL # **221225-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | MIN: | 1.47 | mm | 58 | mil | Thickness..... | 1.5 | mm | 60 mil |
| | MAX: | 1.83 | mm | 72 | mil | Length..... | 125 | m | 410.1 feet |
| Asperity GRI GM12: 27 mil | AVE: | 1.64 | mm | 65 | mil | Width..... | 7.00 | m; | 23.0 feet |
| ODD # : TOP EVEN #: BOTTOM | | | | | | OIT(Standard) ASTM D3895 minutes | 166 | | |

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.70 | |
| 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 | 155 | ppi | 2,395 | psi |
| | Average Strength @ Break | 31 | N/mm | 174 | ppi | 2,699 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.03 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 485.7 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes
Quality Control Department

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ROLL # **221226-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | | Thickness..... | 1.5 mm | 60 mil |
|---|---|---|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil | Length..... | 125 m | 410.1 feet |
| | MAX: | 1.75 | mm | 69 | mil | Width..... | 7.00 m; | 23.0 feet |
| Asperity GRI GM12: 32 mil | AVE: | 1.65 | mm | 65 | mil | OIT(Standard) ASTM D3895 minutes | 166 | |

ODD # : TOP EVEN #: BOTTOM

| | | | | | TEST RESULTS |
|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | .17 |
| Carbon Black Content ASTM D4218 | Range | % | | | 2.70 |
| 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 | 156 ppi | 2,395 | psi |
| | Average Strength @ Break | 31 N/mm | 175 ppi | 2,699 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | 17.03 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | 485.7 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 N | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 N | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 N | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-20-08**

Signature: H. Holmes
Quality Control Department

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ROLL # **221227-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.48 | mm | 58 | mil |
| | MAX: | 1.87 | mm | 74 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.69 | mm | 67 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | | % | | | | 2.70 | |
| 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 | | 159 | ppi | | 2,395 | psi |
| | Average Strength @ Break | 31 | N/mm | | 180 | ppi | | 2,699 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | | % | | | | 17.03 | |
| Lo = 2.0" Break | Average Elongation @ Break | | | % | | | | 485.7 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes

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ROLL # **221228-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.75 | mm | 69 | mil |
| Asperity GRI GM12: 33 mil | AVE: | 1.61 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.69 | |
| 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 | 155 | ppi | 2,452 | psi |
| | Average Strength @ Break | 29 | N/mm | 166 | ppi | 2,625 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.88 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 497.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-20-08**

Signature: H. Holmes
Quality Control Department

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ROLL # **221229-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.46 | mm | 57 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 28 mil | AVE: | 1.66 | mm | 65 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.69 | |
| 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 | 160 | ppi | 2,452 | psi |
| | Average Strength @ Break | 30 | N/mm | 172 | ppi | 2,625 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.88 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 497.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: [signature]
Quality Control Department

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ROLL # **221230-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.47 | mm | 58 | mil |
| | MAX: | 1.78 | mm | 70 | mil |
| Asperity GRI GM12: 31 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.69 | |
| 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 | 157 | ppi | 2,452 | psi |
| | Average Strength @ Break | 29 | N/mm | 168 | ppi | 2,625 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.88 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 497.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes

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ROLL # **221231-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.47 | mm | 58 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.65 | mm | 65 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |
| OIT(Standard) ASTM D3895 | minutes | 166 | | |

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.69 | |
| 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 | 159 | ppi | | 2,452 | psi |
| | Average Strength @ Break | 30 | N/mm | 170 | ppi | | 2,625 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.88 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 497.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes
Quality Control Department

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# quality certificate

ROLL # **221232-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.78 | mm | 70 | mil |
| Asperity GRI GM12: 34 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.69 | |
| 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 | 157 | ppi | | 2,452 | psi |
| | Average Strength @ Break | 29 | N/mm | 168 | ppi | | 2,625 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.88 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 497.6 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 241.9 | N | | | | 54.395 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 396.2 | N | | | | 89.063 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 595.4 | N | | | | 133.85 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-20-08**

Signature: H Holmes
Quality Control Department

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ROLL # **221233-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.78 | mm | 70 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.64 | mm | 65 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | | 2.65 | |
| 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 | 164 | ppi | | | 2,542 | psi |
| | Average Strength @ Break | 33 | N/mm | 189 | ppi | | | 2,931 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | | 17.55 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | | 510.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes

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ROLL # **221234-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| | AVE: | 1.65 | mm | 65 | mil |

Asperity GRI GM12: 31 mil
ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.65 | |
| 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 | 165 | ppi | 2,542 | psi |
| | Average Strength @ Break | 33 | N/mm | 190 | ppi | 2,931 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.55 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 510.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes
Quality Control Department

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ROLL # **221235-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil |
| | MAX: | 1.83 | mm | 72 | mil |
| Asperity GRI GM12: 27 mil | AVE: | 1.64 | mm | 65 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.65 | |
| 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 | 164 | ppi | | 2,542 | psi |
| | Average Strength @ Break | 33 | N/mm | 189 | ppi | | 2,931 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.55 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 510.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes

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ROLL # **221236-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.53 | mm | 60 | mil |
| | MAX: | 1.83 | mm | 72 | mil |
| Asperity GRI GM12: 33 mil | AVE: | 1.69 | mm | 67 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | | TEST RESULTS |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .949 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .17 |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.65 |
| 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 | 169 | ppi | 2,542 | psi |
| | Average Strength @ Break | 34 | N/mm | 195 | ppi | 2,931 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.55 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 510.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-20-08**

Signature: H. Holmes
Quality Control Department

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ROLL # **221237-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.56 | mm | 61 | mil |
| | MAX: | 1.82 | mm | 72 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.68 | mm | 66 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |
| OIT(Standard) ASTM D3895 | minutes | 166 | | |

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.65 | |
| 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 | 168 | ppi | | 2,542 | psi |
| | Average Strength @ Break | 34 | N/mm | 194 | ppi | | 2,931 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.55 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 510.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes
Quality Control Department

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ROLL # **221238-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.42 | mm | 56 | mil |
| | MAX: | 1.80 | mm | 71 | mil |
| Asperity GRI GM12: 32 mil | AVE: | 1.66 | mm | 65 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **166**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.69 | |
| 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 | 166 | ppi | 2,541 | psi |
| | Average Strength @ Break | 31 | N/mm | 179 | ppi | 2,743 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.59 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 466.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: [signature]
Quality Control Department

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ROLL # **221239-08** Lot #: **MM200319** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.48 | mm | 58 | mil |
| | MAX: | 1.78 | mm | 70 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.66 | mm | 65 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 166

| | | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | | .949 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | | .17 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | | 2.69 | |
| 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 | 166 | ppi | | | 2,541 | psi |
| | Average Strength @ Break | 31 | N/mm | 179 | ppi | | | 2,743 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | | 17.59 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | | 466.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | | -0.16 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes

Quality Control Department

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ROLL # **221240-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.42 | mm | 56 | mil |
| | MAX: | 1.80 | mm | 71 | mil |
| | AVE: | 1.65 | mm | 65 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 32 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.69 | |
| 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 | 165 | ppi | | 2,541 | psi |
| | Average Strength @ Break | 31 | N/mm | 178 | ppi | | 2,743 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 17.59 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 466.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes

Quality Control Department

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# quality certificate

ROLL # **221241-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.47 | mm | 58 | mil |
| | MAX: | 1.81 | mm | 71 | mil |
| Asperity GRI GM12: 25 mil | AVE: | 1.67 | mm | 66 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.69 | |
| 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 | 167 | ppi | | 2,541 | psi |
| | Average Strength @ Break | 32 | N/mm | 180 | ppi | | 2,743 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.59 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 466.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes
Quality Control Department

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# quality certificate

ROLL # **221242-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.47 | mm | 58 | mil |
| | MAX: | 1.86 | mm | 73 | mil |
| Asperity GRI GM12: 27 mil | AVE: | 1.67 | mm | 66 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.69 | |
| 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 | 167 | ppi | 2,541 | psi |
| | Average Strength @ Break | 32 | N/mm | 180 | ppi | 2,743 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.59 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 466.1 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 250.8 | N | | | 56.385 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 400.9 | N | | | 90.139 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-20-08**

Signature:

Quality Control Department

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ROLL # **221243-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.40 | mm | 55 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 27 mil | AVE: | 1.60 | mm | 63 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |
| OIT(Standard) ASTM D3895 minutes | 164 | |

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .19 | |
| 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 | 26 | N/mm | 150 | ppi | 2,383 | psi |
| | Average Strength @ Break | 32 | N/mm | 182 | ppi | 2,883 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 18.25 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.9 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes
Quality Control Department

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ROLL # **221244-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil |
| | MAX: | 1.86 | mm | 73 | mil |
| | AVE: | 1.65 | mm | 65 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 29 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .19 | |
| 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 | 155 | ppi | | 2,383 | psi |
| | Average Strength @ Break | 33 | N/mm | 187 | ppi | | 2,883 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 18.25 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 507.9 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H. Holmes
Quality Control Department

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ROLL # **221245-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.45 | mm | 57 | mil |
| | MAX: | 1.74 | mm | 69 | mil |
| Asperity GRI GM12: 22 mil | AVE: | 1.63 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 mm | 60 mil | |
| Length..... | 125 m | 410.1 | feet |
| Width..... | 7.00 m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | TEST RESULTS |
|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | .19 |
| 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 | 153 | ppi | 2,383 psi |
| | Average Strength @ Break | 32 | N/mm | 185 | ppi | 2,883 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Yield | % | | | | 18.25 |
| | Average Elongation @ Break | % | | | | 507.9 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | 57.844 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | 99.360 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | 126.52 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: [signature]
Quality Control Department

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ROLL # **221246-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.84 | mm | 72 | mil |
| | AVE: | 1.62 | mm | 64 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 31 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| 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 | 152 | ppi | | 2,383 | psi |
| | Average Strength @ Break | 32 | N/mm | 184 | ppi | | 2,883 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 18.25 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 507.9 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-20-08

Signature: H Holmes
Quality Control Department

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ROLL # **221347-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.41 | mm | 56 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 25 mil | AVE: | 1.59 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| 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 | 26 | N/mm | 149 | ppi | | 2,383 | psi |
| | Average Strength @ Break | 32 | N/mm | 180 | ppi | | 2,883 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield Lo = 2.0" Break | Average Elongation @ Yield | | % | | | | 18.25 | |
| | Average Elongation @ Break | | % | | | | 507.9 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: [signature]
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ROLL # **221348-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.39 | mm | 55 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 30 mil | AVE: | 1.58 | mm | 62 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.23 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 in Cat. 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) | Average Strength @ Yield | 25 | N/mm | 141 | ppi | | 2,273 | psi |
| | Average Strength @ Break | 30 | N/mm | 170 | ppi | | 2,725 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.35 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 503.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: [signature]
Quality Control Department

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ROLL # **221349-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.74 | mm | 69 | mil |
| Asperity GRI GM12: 26 mil | AVE: | 1.59 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | TEST RESULTS |
|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | .948 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | .19 |
| Carbon Black Content ASTM D4218 | Range | % | | 2.23 |
| Carbon Black Dispersion ASTM D5596 | Category | | | 10 in Cat. 1 |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) | Average Strength @ Yield | 25 N/mm | 142 ppi | 2,273 psi |
| | Average Strength @ Break | 30 N/mm | 171 ppi | 2,725 psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | 17.35 |
| Lo = 2.0" Break | Average Elongation @ Break | % | | 503.0 |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | -0.35 |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 N | | 57.844 lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 N | | 99.360 lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 N | | 126.52 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: [signature]
Quality Control Department

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ROLL # **221350-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.47 | mm | 58 | mil |
| | MAX: | 1.86 | mm | 73 | mil |
| Asperity GRI GM12: 30 mil | AVE: | 1.62 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.23 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | 10 in Cat. 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) | Average Strength @ Yield | 25 | N/mm | 145 | ppi | 2,273 | psi |
| | Average Strength @ Break | 30 | N/mm | 174 | ppi | 2,725 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.35 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 503.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: [signature]
Quality Control Department

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# quality certificate

ROLL # **221351-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.36 | mm | 54 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 24 mil | AVE: | 1.58 | mm | 62 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.23 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 in Cat. 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) | Average Strength @ Yield | 25 | N/mm | 141 | ppi | | 2,273 | psi |
| | Average Strength @ Break | 30 | N/mm | 170 | ppi | | 2,725 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 17.35 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 503.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature:

Quality Control Department

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ROLL # **221352-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.39 | mm | 55 | mil |
| | MAX: | 1.76 | mm | 69 | mil |
| | AVE: | 1.60 | mm | 63 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: **31** mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | | 2.23 | |
| Carbon Black Dispersion ASTM D5596 | Category | | | | | | 10 in Cat. 1 | |
| Tensile Strength ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) | Average Strength @ Yield | 25 | N/mm | 143 | ppi | | 2,273 | psi |
| | Average Strength @ Break | 30 | N/mm | 172 | ppi | | 2,725 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | | 17.35 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | | 503.0 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 257.3 | N | | | | 57.844 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 442.0 | N | | | | 99.360 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 562.8 | N | | | | 126.52 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-21-08**

Signature: H. Holmes
Quality Control Department

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ROLL # **221353-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | | Thickness..... | 1.5 mm | 60 mil |
|---|---|---|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil | Length..... | 125 m | 410.1 feet |
| | MAX: | 1.82 | mm | 72 | mil | Width..... | 7.00 m; | 23.0 feet |
| Asperity GRI GM12: 22 mil | AVE: | 1.61 | mm | 63 | mil | OIT(Standard) ASTM D3895 minutes | 164 | |

ODD # : TOP EVEN #: BOTTOM

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .19 | |
| 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 | 27 | N/mm | 157 | ppi | 2,474 | psi |
| | Average Strength @ Break | 32 | N/mm | 183 | ppi | 2,889 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.05 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H Holmes

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ROLL # **221354-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | MIN: | 1.50 | mm | 59 | mil | Thickness..... | 1.5 | mm | 60 mil |
| | MAX: | 1.89 | mm | 74 | mil | Length..... | 125 | m | 410.1 feet |
| | AVE: | 1.70 | mm | 67 | mil | Width..... | 7.00 | m; | 23.0 feet |

Asperity GRI GM12: **24** mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| 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 | 166 | ppi | | 2,474 | psi |
| | Average Strength @ Break | 34 | N/mm | 193 | ppi | | 2,889 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.05 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 507.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-21-08**

Signature: H Holmes
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ROLL # **221355-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.39 | mm | 55 | mil |
| | MAX: | 1.77 | mm | 70 | mil |
| Asperity GRI GM12: 27 mil | AVE: | 1.62 | mm | 64 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .19 | |
| 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 | 158 | ppi | 2,474 | psi |
| | Average Strength @ Break | 32 | N/mm | 184 | ppi | 2,889 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.05 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **5-21-08**

Signature.....

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ROLL # **221356-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.39 | mm | 55 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| | AVE: | 1.60 | mm | 63 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 30 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| 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 | 27 | N/mm | 156 | ppi | | 2,474 | psi |
| | Average Strength @ Break | 32 | N/mm | 182 | ppi | | 2,889 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.05 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 507.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H. Palmer
Quality Control Department

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ROLL # **221357-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.49 | mm | 59 | mil |
| | MAX: | 1.79 | mm | 70 | mil |
| Asperity GRI GM12: 29 mil | AVE: | 1.62 | mm | 64 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | |
|---|---|---|
| Thickness..... | 1.5 mm | 60 mil |
| Length..... | 125 m | 410.1 feet |
| Width..... | 7.00 m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .19 | |
| 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 | 158 | ppi | 2,474 | psi |
| | Average Strength @ Break | 32 | N/mm | 184 | ppi | 2,889 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.05 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 507.4 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H Holmes
Quality Control Department

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ROLL # **221358-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil |
| | MAX: | 1.75 | mm | 69 | mil |
| | AVE: | 1.61 | mm | 63 | mil |

| | | | | |
|---|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 | mil |
| Length..... | 125 | m | 410.1 | feet |
| Width..... | 7.00 | m; | 23.0 | feet |

Asperity GRI GM12: 30 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 164

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190ºC /2160 g | | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.44 | |
| 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 | 162 | ppi | | 2,548 | psi |
| | Average Strength @ Break | 32 | N/mm | 183 | ppi | | 2,893 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.06 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 494.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H Holmes
Quality Control Department

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ROLL # **221359-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.43 | mm | 56 | mil |
| | MAX: | 1.73 | mm | 68 | mil |
| Asperity GRI GM12: 31 mil | AVE: | 1.60 | mm | 63 | mil |

ODD # : TOP EVEN #: BOTTOM

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |

OIT(Standard) ASTM D3895 minutes **164**

| | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | % | | | | 2.44 | |
| 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 | 161 | ppi | 2,548 | psi |
| | Average Strength @ Break | 32 | N/mm | 182 | ppi | 2,893 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | | | 17.06 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | | | 494.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H Holmes

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ROLL # **221360-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | MIN: | 1.44 | mm | 57 | mil | Thickness..... | 1.5 | mm | 60 mil |
| | MAX: | 1.77 | mm | 70 | mil | Length..... | 125 | m | 410.1 feet |
| | | | | | | Width..... | 7.00 | m; | 23.0 feet |
| Asperity GRI GM12: 31 mil | AVE: | 1.59 | mm | 63 | mil | OIT(Standard) ASTM D3895 minutes | 164 | | |

ODD # : TOP EVEN #: BOTTOM

| | | | | | TEST RESULTS |
|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | g/cc | | | .948 |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | g/10 min | | | .19 |
| Carbon Black Content ASTM D4218 | Range | % | | | 2.44 |
| 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 | 160 ppi | 2,548 | psi |
| | Average Strength @ Break | 32 N/mm | 181 ppi | 2,893 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | % | | 17.06 | |
| Lo = 2.0" Break | Average Elongation @ Break | % | | 494.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | % | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 N | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 N | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 N | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H. Holmes

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ROLL # **221361-08** Lot #: **MM200325** **Liner Type: MICROSPIKE™ HDPE**

| Measurement ASTM D5994 (Modified) | | METRIC | | ENGLISH | |
|---|---|---|---|---|---|
| | MIN: | 1.48 | mm | 58 | mil |
| | MAX: | 1.81 | mm | 71 | mil |
| Asperity GRI GM12: 25 mil | AVE: | 1.60 | mm | 63 | mil |
| ODD # : TOP EVEN #: BOTTOM | | | | | |

| | | | |
|---|---|---|---|
| Thickness..... | 1.5 | mm | 60 mil |
| Length..... | 125 | m | 410.1 feet |
| Width..... | 7.00 | m; | 23.0 feet |
| OIT(Standard) ASTM D3895 | minutes | 164 | |

| | | | | | | | TEST RESULTS | |
|---|---|---|---|---|---|---|---|---|
| Specific Gravity ASTM D792 | Density | | g/cc | | | | .948 | |
| MFI ASTM D1238 COND. E GRADE: 7002 | Melt Flow Index 190°C /2160 g | | g/10 min | | | | .19 | |
| Carbon Black Content ASTM D4218 | Range | | % | | | | 2.44 | |
| 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 | 161 | ppi | | 2,548 | psi |
| | Average Strength @ Break | 32 | N/mm | 182 | ppi | | 2,893 | psi |
| Elongation ASTM D6693 ASTM D638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield | Average Elongation @ Yield | | % | | | | 17.06 | |
| Lo = 2.0" Break | Average Elongation @ Break | | % | | | | 494.3 | |
| Dimensional Stability ASTM D1204 (Modified) | Average Dimensional change | | % | | | | -0.35 | |
| Tear Resistance ASTM D-1004 (Modified) | Average Tear Resistance | 239.9 | N | | | | 53.941 | lbs |
| Puncture Resistance FTMS 101 Method 2065 (Modified) | Load | 440.5 | N | | | | 99.040 | lbs |
| Puncture Resistance ASTM D4833 (Modified) | Load | 584.1 | N | | | | 131.31 | 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: **Allied Waste Industries, Inc.**
PO: **Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 5-21-08

Signature: H. Holmes
Quality Control Department

60HDmic.FRM
REV 03
12/23/05

PÉTROMONT

## GM 13 Properties for Petromont 7002 HDPE resin

| Physical Properties on geo | Test Method | Unit | GM-13 Standard Requirements | Agru MM192674 using lot #192674 |
|---|---|---|---|---|
| **Density** | D1505 | g/cc | >0.940 | **0.9487** |
| **Tensile properties**<br>Yield strength<br>Break strength<br>Yield elongation<br>Break elongation | D6693 | <br>lb/in.<br>lb/in.<br>%<br>% | <br>84<br>152<br>12<br>700 | MD - TD<br>**104 - 112**<br>**206 - 193**<br>**18.4 - 15.5**<br>**820 - 924** |
| **Tear resistance (min. ave.)** | D1004 | lb | 28 | **36.8 - 31.0** |
| **Puncture resistance (min. ave.)** | D4833 | lb | 72 | **106** |
| **Carbon black Content** | D1603 | % | 2.0 -3.0 | **2.5** |
| **Carbon black dispersion – Rating agglomerate size range** | D5596 | # of agglomerate per Category | 9 in Categories 1 or 2<br>1 in Category 3 | **9 in Category 1**<br>**1 in Category 2**<br>**0 in Category 3** |
| **Stress Cracking resistance - NCTL** | D5397 | h | > 300 | **> 2950** |
| **Standard O.I.T. (200°C)** | D3895 | min. | >100 | **137.5** |
| **HP OIT (150°C)** | D5885 | min. | >400 | **667*** |
| **Oven aging (85°C – 90 days)**<br>Retention of OIT or **HP-OIT**<br><br>*OIT or HP-OIT (unexposed)*<br>*OIT or HP-OIT after 90days* | D5721<br><br><br>*D3895*<br>*D3895* | <br>%<br><br>*min.*<br>*min.* | <br>> 55St or >80HP | <br>**83.8HP** ✓<br><br>*667*<br>*559* |
| **UV resistance (1600 hrs of UV exposition)**<br>Retention of **HP-OIT**<br><br>*HP-OIT (unexposed)*<br>*HP-OIT after 1600 hrs* | GM11<br><br><br>*D 5885*<br>*D 5885* | <br>%<br><br>*min.*<br>*min.* | <br>**>50** | <br>**84.3** ✓<br><br>*667*<br>*562* |

* HP OIT formulated resin  MD = Machine Direction  TD = Transverse Direction

PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

## Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
004744

Your material number

## Quality certificate

Date
2008/04/16 10:05:54

Delivery item
PETROMONT HDPE-7002

Delivery number and item
80130492 000010

Order number and item
35486 000010

Vehicule
CGLX 10510

Material : PETROMONT HDPE-7002
Batch MM 200319 / Qty 91,200 KG 201,062 lb

| Characteristics | Unit | Value | Lower limit | Upper limit |
|---|---|---|---|---|
| Melt index 190C 2.16 kg | g/10mi | 0.173 | 0.160 | |
| Flow Index 190C 21.6kg | g/10mi | 21.1 | 19.5 | 24.5 |
| Density ASTM 23C | g/cc | 0.9383 | 0.9365 | 0.9385 |
| Pellet Count | #/g | 28 | 20 | 35 |
| Oxydative Induction Time | min | 167 | 100 | |

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

## Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
004744

Your material number

## Quality certificate

Date
2008/04/17 09:07:02

Delivery item
PETROMONT HDPE-7002

Delivery number and item
80130579 000010

Order number and item
35490 000010

Vehicule
UNPX 123640

Material : PETROMONT HDPE-7002
Batch MM 200325 / Qty 90,440 KG 199,386 lb

| Characteristics | Unit | Value | Lower limit | Upper limit |
|---|---|---|---|---|
| Melt index 190C 2.16 kg | g/10mi | 0.191 | 0.160 | |
| Flow Index 190C 21.6kg | g/10mi | 22.7 | 19.5 | 24.5 |
| Density ASTM 23C | g/cc | 0.9371 | 0.9365 | 0.9385 |
| Pellet Count | #/g | 27 | 20 | 35 |
| Oxydative Induction Time | min | 176 | 100 | |

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

of NORTH CAROLINA, PLLC

# SECTION E-2

## Geosynthetic Clay liner

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

## PRODUCTION CERTIFICATION

PROJECT NAME: Charlotte Motor Speedway
CUSTOMER P.O.:
PREPARED FOR: Allied Waste

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

## NEEDLE REMOVAL AND DETECTION 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

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. ( CETCO )

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Ship Date: 06/06/2008
Order Number: 023925801
Prepared For: Allied Waste

The GCL raw materials and GCL finished product manufactured for the above-referenced order number(s) are hereby certified to achieve the properties 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 (3.6 kg/sq m) Min |
| ASTM D 5890 | Bentonite Swell Index | 1 per 50 Tons | 24 ml/2g Min |
| ASTM D 4632 | GCL Grab Strength | 200,000 sq ft (20,000 sq m) | 90 lbs (400 N) MARV |
| ASTM D 6768 | GCL Grab Strength | 200,000 sq ft (20,000 sq m) | 30 lbs/in MARV |
| ASTM D 5321 | GCL Hydrated Internal Shear Strength | Periodic | 500 psf (24 kPa) typ @ 200 psf |
| ASTM D 5887 | GCL Hydraulic Conductivity | Weekly | 5 x 10^-9 cm/ sec Max |
| ASTM D 5887 | GCL Index Flux | Weekly | 1 x 10^-8 m^3/m^2/sec Max |
| ASTM D 6496 | GCL Peel Strength | 40,000 sq ft (4000 sq m) | 3.5 lbs/in Min |
| ASTM D 4632 | GCL Peel Strength | 40,000 sq ft (4000 sq m) | 15 lbs (65 N) Min |

## SPECIALY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

| Test Method | Test Method Property | Requested Frequency | Requested Value | Requested Conditions |
|---|---|---|---|---|
| ASTM D 5890 | Bentonite Swell Index | 1/100,000sf | Standard | Standard |
| ASTM D 5891 | Bentonite Fluid Loss | 1/100,000sf | Standard | Standard |
| ASTM D 5887 | GCL Hydraulic Conductivity | 1/100,000sf | Standard | Standard |
| ASTM D 6496 | GCL Peel Strength | 1/40,000sf | Standard | 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.

## FABRIC SUPPLIER REQUIREMENTS FOR BENTOMAT ST

| Raw Material | test method | mass per area | units |
|---|---|---|---|
| Nonwoven Cover Fabric | ASTM D 5261 | 6.0 | oz/yd2 |
| Bentomat ST Woven Base Fabric | ASTM D 5261 | 3.2 | oz/yd2 |

Fabric certifications from our raw material suppliers are on file at our production facility.

CETCO's MQA laboratory is GAI-accredited (www.geosynthetic-institute.org/gai/lab.html).

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925801

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005686 | 150 | 15 | 2250 | 2724 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005687 | 150 | 15 | 2250 | 2738 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005712 | 150 | 15 | 2250 | 3020 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005717 | 150 | 15 | 2250 | 2776 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005718 | 150 | 15 | 2250 | 2776 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005720 | 150 | 15 | 2250 | 2780 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005721 | 150 | 15 | 2250 | 2784 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005729 | 150 | 15 | 2250 | 2844 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005734 | 150 | 15 | 2250 | 2784 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005736 | 150 | 15 | 2250 | 2788 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005737 | 150 | 15 | 2250 | 2794 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005740 | 150 | 15 | 2250 | 2764 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005742 | 150 | 15 | 2250 | 2770 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005743 | 150 | 15 | 2250 | 2776 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005750 | 150 | 15 | 2250 | 2774 |
| 023925801 | CV-BENTOMAT ST | 200823CV | 00005769 | 150 | 15 | 2250 | 2829 |
| | | | Totals: | **2400** | **240** | **36000** | **44721** |
| | | | | Total Number of Rolls Certified: **16** | | | |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925801

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| **GCL Lot #** | **GCL Roll #** | **Roll # Tested** | **Cap Lot #** | **Cap Roll #** | **Roll # Tested** | **Base Roll #** | **Clay Lot #** |
| 200823CV | 00005686 | 00005685 | 200823CV | 00002213 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005687 | 00005685 | 200823CV | 00002213 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005712 | 00005700 | 200823CV | 00002204 | 00002201 | 2010004813 | 859586B |
| 200823CV | 00005717 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005718 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005720 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005721 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005729 | 00005729 | 1010124179 | | | 2010004813 | 859586B |
| 200823CV | 00005734 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005736 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005737 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005740 | 00005739 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005742 | 00005739 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005743 | 00005739 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005750 | 00005747 | 1010124176 | | | 2010005758 | 859586B |
| 200823CV | 00005769 | 00005763 | 1010124172 | | | 2010242055 | 859592A |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925801 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005685 | 0.87 | 46.9 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.95 | 42.8 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005729 | 0.96 | 52.0 | 5.6 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.96 | 52.0 | 6.6 |
| CV-BENTOMAT ST | 200823CV | 00005739 | 0.96 | 52.0 | 5.7 |
| CV-BENTOMAT ST | 200823CV | 00005747 | 0.85 | 52.0 | 5.6 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.84 | 52.0 | 6.2 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005685 | 16.1 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005729 | 15.7 | 30.0 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005739 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005747 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.0 | 0.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925801 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586A | 28.0 | 16.0 |
| 859586B | 28.0 | 15.8 |
| 859592A | 25.0 | 17.6 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925801 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925801 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005758 | 3.4 | 176.0 |
| PPX 82TEX | 2010005767 | 3.4 | 176.0 |
| PPX 82TEX | 2010242055 | 3.4 | 187.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124171 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124172 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124173 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124176 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124178 | 6.5 | 97.0 |
| DALCO 6osy-natural | 1010124179 | 6.5 | 97.0 |

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.

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925802

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005642 | 150 | 15 | 2250 | 2840 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005643 | 150 | 15 | 2250 | 2870 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005645 | 150 | 15 | 2250 | 2794 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005646 | 150 | 15 | 2250 | 2992 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005647 | 150 | 15 | 2250 | 2810 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005656 | 150 | 15 | 2250 | 2932 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005657 | 150 | 15 | 2250 | 2860 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005658 | 150 | 15 | 2250 | 2850 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005659 | 150 | 15 | 2250 | 2836 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005660 | 150 | 15 | 2250 | 2880 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005666 | 150 | 15 | 2250 | 2886 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005667 | 150 | 15 | 2250 | 2896 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005668 | 150 | 15 | 2250 | 2890 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005672 | 150 | 15 | 2250 | 2794 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005673 | 150 | 15 | 2250 | 2772 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005674 | 150 | 15 | 2250 | 2772 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005675 | 150 | 15 | 2250 | 2784 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005676 | 150 | 15 | 2250 | 2772 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005678 | 150 | 15 | 2250 | 2764 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005681 | 150 | 15 | 2250 | 2842 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005682 | 150 | 15 | 2250 | 2790 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005683 | 150 | 15 | 2250 | 2776 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005684 | 150 | 15 | 2250 | 2734 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005688 | 150 | 15 | 2250 | 2716 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005689 | 150 | 15 | 2250 | 2728 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005691 | 150 | 15 | 2250 | 2728 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005694 | 150 | 15 | 2250 | 2762 |

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005695 | 150 | 15 | 2250 | 2750 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005696 | 150 | 15 | 2250 | 2760 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005697 | 150 | 15 | 2250 | 2752 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005699 | 150 | 15 | 2250 | 2734 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005700 | 150 | 15 | 2250 | 2798 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005701 | 150 | 15 | 2250 | 2792 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005703 | 150 | 15 | 2250 | 2806 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005705 | 150 | 15 | 2250 | 2802 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005801 | 150 | 15 | 2250 | 2770 |
| 023925802 | CV-BENTOMAT ST | 200823CV | 00005813 | 150 | 15 | 2250 | 2756 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005823 | 150 | 15 | 2250 | 2764 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005828 | 150 | 15 | 2250 | 2764 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005829 | 150 | 15 | 2250 | 2754 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005834 | 150 | 15 | 2250 | 2714 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005837 | 150 | 15 | 2250 | 2886 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005838 | 150 | 15 | 2250 | 2768 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005858 | 150 | 15 | 2250 | 2808 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005861 | 150 | 15 | 2250 | 2774 |
| 023925803 | CV-BENTOMAT ST | 200823CV | 00005869 | 150 | 15 | 2250 | 2764 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005873 | 150 | 15 | 2250 | 2912 |
| 023925806 | CV-BENTOMAT ST | 200823CV | 00005876 | 150 | 15 | 2250 | 2826 |
| | | | Totals: | **7200** | **720** | **108000** | **134524** |
| | | | | | | Total Number of Rolls Certified: **48** | |

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LINING TECHNOLOGIES
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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925802

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
| 200823CV | 00005642 | 00005641 | 200818CV | 00001611 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005643 | 00005641 | 200818CV | 00001611 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005645 | 00005641 | 200818CV | 00001611 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005646 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005647 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005656 | 00005656 | 200823CV | 00002241 | 00002238 | 2010147946 | 859589B |
| 200823CV | 00005657 | 00005656 | 200823CV | 00002241 | 00002238 | 2010147946 | 859589B |
| 200823CV | 00005658 | 00005656 | 200823CV | 00002241 | 00002238 | 2010147946 | 859589B |
| 200823CV | 00005659 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859589B |
| 200823CV | 00005660 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859589B |
| 200823CV | 00005666 | 00005656 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005667 | 00005656 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005668 | 00005656 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005672 | 00005671 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005673 | 00005671 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005674 | 00005671 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005675 | 00005671 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005676 | 00005671 | 200823CV | 00002216 | 00002210 | 2010147739 | 859586A |
| 200823CV | 00005678 | 00005671 | 200823CV | 00002216 | 00002210 | 2010147739 | 859586A |
| 200823CV | 00005681 | 00005671 | 200823CV | 00002212 | 00002210 | 2010147739 | 859586A |
| 200823CV | 00005682 | 00005671 | 200823CV | 00002212 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005683 | 00005671 | 200823CV | 00002212 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005684 | 00005671 | 200823CV | 00002212 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005688 | 00005685 | 200823CV | 00002213 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005689 | 00005685 | 200823CV | 00002213 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005691 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005694 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005695 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005696 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |

| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
|---|---|---|---|---|---|---|---|
| 200823CV | 00005697 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005699 | 00005685 | 200823CV | 00002208 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005700 | 00005700 | 200823CV | 00002209 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005701 | 00005700 | 200823CV | 00002209 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005703 | 00005700 | 200823CV | 00002209 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005705 | 00005700 | 200823CV | 00002209 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005801 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005813 | 00005811 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005823 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005828 | 00005817 | 200823CV | 00002214 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005829 | 00005817 | 200823CV | 00002214 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005834 | 00005832 | 200823CV | 00002278 | 00002273 | 2010147945 | 859592B |
| 200823CV | 00005837 | 00005832 | 200823CV | 00002278 | 00002273 | 2010147945 | 859592B |
| 200823CV | 00005838 | 00005832 | 200823CV | 00002278 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005858 | 00005847 | 200823CV | 00002279 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005861 | 00005861 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005869 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005873 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005876 | 00005876 | 200823CV | 00002282 | 00002279 | 2009990798 | 861159A |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925802 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005641 | 0.93 | 46.9 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.98 | 46.9 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.82 | 46.9 | 9.8 |
| CV-BENTOMAT ST | 200823CV | 00005685 | 0.87 | 46.9 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.88 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005811 | 0.91 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 0.89 | 68.1 | 6.4 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.86 | 68.1 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005847 | 0.96 | 68.1 | 5.7 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 0.97 | 68.1 | 5.5 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.91 | 68.1 | 4.8 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005641 | 17.9 | 26.0 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005685 | 16.1 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005811 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 16.2 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005847 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 14.8 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.0 | 0.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925802 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586a | 28.0 | 16.0 |
| 859589B | 27.0 | 16.8 |
| 859592B | 26.0 | 17.8 |
| 861159A | 26.0 | 16.4 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925802 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200817CV | 00001523 | 6.8 | 41.1 |
| CV-NON-WOVEN | 200818CV | 00001610 | 6.3 | 42.6 |
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |
| CV-NON-WOVEN | 200823CV | 00002220 | 6.7 | 20.9 |
| CV-NON-WOVEN | 200823CV | 00002238 | 6.8 | 42.4 |
| CV-NON-WOVEN | 200823CV | 00002263 | 6.3 | 31.9 |
| CV-NON-WOVEN | 200823CV | 00002273 | 7.5 | 44.5 |
| CV-NON-WOVEN | 200823CV | 00002279 | 6.4 | 38.9 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925802 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009941948 | 3.2 | 170.0 |
| PPX 82TEX | 2009990798 | 3.4 | 172.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005767 | 3.4 | 176.0 |
| PPX 82TEX | 2010147739 | 3.4 | 169.0 |
| PPX 82TEX | 2010147945 | 3.4 | 169.0 |
| PPX 82TEX | 2010147946 | 3.4 | 149.0 |
| PPX 82TEX | 2010242055 | 3.4 | 187.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124169 | 6.5 | 98.0 |

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.

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925804

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005605 | 150 | 15 | 2250 | 2810 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005612 | 150 | 15 | 2250 | 2906 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005615 | 150 | 15 | 2250 | 2846 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005616 | 150 | 15 | 2250 | 2848 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005621 | 150 | 15 | 2250 | 2818 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005628 | 150 | 15 | 2250 | 2848 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005636 | 150 | 15 | 2250 | 2964 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005637 | 150 | 15 | 2250 | 3054 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005638 | 150 | 15 | 2250 | 2850 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005640 | 150 | 15 | 2250 | 2822 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005641 | 150 | 15 | 2250 | 2846 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005651 | 150 | 15 | 2250 | 2802 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005652 | 150 | 15 | 2250 | 2796 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005653 | 150 | 15 | 2250 | 2824 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005662 | 150 | 15 | 2250 | 2848 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005663 | 150 | 15 | 2250 | 2872 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005665 | 150 | 15 | 2250 | 2888 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005669 | 150 | 15 | 2250 | 2896 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005670 | 150 | 15 | 2250 | 2828 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005690 | 150 | 15 | 2250 | 2726 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005693 | 150 | 15 | 2250 | 2754 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005702 | 150 | 15 | 2250 | 2780 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005763 | 150 | 15 | 2250 | 2758 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005767 | 150 | 15 | 2250 | 2776 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005771 | 150 | 15 | 2250 | 2828 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005772 | 150 | 15 | 2250 | 2760 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005773 | 150 | 15 | 2250 | 2780 |

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005781 | 150 | 15 | 2250 | 2756 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005782 | 150 | 15 | 2250 | 2762 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005783 | 150 | 15 | 2250 | 2762 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005784 | 150 | 15 | 2250 | 2766 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005785 | 150 | 15 | 2250 | 2722 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005790 | 150 | 15 | 2250 | 2752 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005793 | 150 | 15 | 2250 | 2768 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005798 | 150 | 15 | 2250 | 2778 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005802 | 150 | 15 | 2250 | 2770 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005803 | 150 | 15 | 2250 | 2774 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005809 | 150 | 15 | 2250 | 2754 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005810 | 150 | 15 | 2250 | 2754 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005812 | 150 | 15 | 2250 | 2738 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005814 | 150 | 15 | 2250 | 2758 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005815 | 150 | 15 | 2250 | 2750 |
| 023925805 | CV-BENTOMAT ST | 200823CV | 00005816 | 150 | 15 | 2250 | 2756 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005817 | 150 | 15 | 2250 | 2754 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005820 | 150 | 15 | 2250 | 2772 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005821 | 150 | 15 | 2250 | 2766 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005822 | 150 | 15 | 2250 | 2768 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005824 | 150 | 15 | 2250 | 2752 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005825 | 150 | 15 | 2250 | 2778 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005826 | 150 | 15 | 2250 | 2807 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005830 | 150 | 15 | 2250 | 2758 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005831 | 150 | 15 | 2250 | 2718 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005832 | 150 | 15 | 2250 | 2730 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005841 | 150 | 15 | 2250 | 2766 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005843 | 150 | 15 | 2250 | 2772 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005844 | 150 | 15 | 2250 | 2780 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005845 | 150 | 15 | 2250 | 2772 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005846 | 150 | 15 | 2250 | 2616 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005848 | 150 | 15 | 2250 | 2792 |

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005849 | 150 | 15 | 2250 | 2774 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005850 | 150 | 15 | 2250 | 2776 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005851 | 150 | 15 | 2250 | 2780 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005852 | 150 | 15 | 2250 | 2776 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005853 | 150 | 15 | 2250 | 2792 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005854 | 150 | 15 | 2250 | 2790 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005860 | 150 | 15 | 2250 | 2930 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005867 | 150 | 15 | 2250 | 2778 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005868 | 150 | 15 | 2250 | 2792 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005870 | 150 | 15 | 2250 | 2794 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005871 | 150 | 15 | 2250 | 2788 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005872 | 150 | 15 | 2250 | 2794 |
| 023925810 | CV-BENTOMAT ST | 200823CV | 00005875 | 150 | 15 | 2250 | 2766 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005877 | 150 | 15 | 2250 | 2798 |
| 023925809 | CV-BENTOMAT ST | 200823CV | 00005878 | 150 | 15 | 2250 | 2792 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005885 | 150 | 15 | 2250 | 2754 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005886 | 150 | 15 | 2250 | 2782 |
| 023925804 | CV-BENTOMAT ST | 200823CV | 00005889 | 150 | 15 | 2250 | 2968 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005891 | 150 | 15 | 2250 | 2842 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005892 | 150 | 15 | 2250 | 2850 |
| 023925807 | CV-BENTOMAT ST | 200823CV | 00005893 | 150 | 15 | 2250 | 2848 |
| | | | Totals: | **12000** | **1200** | **180000** | **223713** |
| | | | | Total Number of Rolls Certified: **80** | | | |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925804

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
| 200823CV | 00005605 | 00005596 | 200817CV | 00001500 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005612 | 00005612 | 200817CV | 00001499 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005615 | 00005612 | 200823CV | 00002199 | 00002191 | 2010152741 | 859589A |
| 200823CV | 00005616 | 00005612 | 200823CV | 00002199 | 00002191 | 2010152741 | 859589A |
| 200823CV | 00005621 | 00005612 | 200818CV | 00001631 | 00001623 | 2010152741 | 859589B |
| 200823CV | 00005628 | 00005627 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005636 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005637 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005638 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005640 | 00005627 | 200818CV | 00001611 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005641 | 00005641 | 200818CV | 00001611 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005651 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005652 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005653 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005662 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859589B |
| 200823CV | 00005663 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859589B |
| 200823CV | 00005665 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859586A |
| 200823CV | 00005669 | 00005656 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005670 | 00005656 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005690 | 00005685 | 200823CV | 00002213 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005693 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005702 | 00005700 | 200823CV | 00002209 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005763 | 00005763 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005767 | 00005763 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005771 | 00005771 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005772 | 00005771 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005773 | 00005773 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005781 | 00005779 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005782 | 00005779 | 1010124175 | | | 2010242055 | 859592A |

| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
|---|---|---|---|---|---|---|---|
| 200823CV | 00005783 | 00005779 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005784 | 00005779 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005785 | 00005779 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005790 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005793 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005798 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005802 | 00005795 | 1010124169 | | | 2009941948 | 859592B |
| 200823CV | 00005803 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005809 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005810 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005812 | 00005811 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005814 | 00005811 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005815 | 00005811 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005816 | 00005811 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005817 | 00005817 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005820 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005821 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005822 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005824 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005825 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005826 | 00005817 | 200823CV | 00002214 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005830 | 00005817 | 200823CV | 00002214 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005831 | 00005817 | 200823CV | 00002214 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005832 | 00005832 | 200823CV | 00002278 | 00002273 | 2009941948 | 859592B |
| 200823CV | 00005841 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005843 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005844 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005845 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005846 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005848 | 00005847 | 200823CV | 00002267 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005849 | 00005847 | 200823CV | 00002267 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005850 | 00005847 | 200823CV | 00002267 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005851 | 00005847 | 200823CV | 00002267 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005852 | 00005847 | 200823CV | 00002267 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005853 | 00005847 | 200823CV | 00002267 | 00002263 | 2009990798 | 861159A |

| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
|---|---|---|---|---|---|---|---|
| 200823CV | 00005854 | 00005847 | 200823CV | 00002279 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005860 | 00005847 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005867 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005868 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005870 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005871 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005872 | 00005861 | 200823CV | 00002270 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005875 | 00005861 | 200823CV | 00002282 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005877 | 00005876 | 200823CV | 00002282 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005878 | 00005876 | 200823CV | 00002282 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005885 | 00005876 | 200823CV | 00002272 | 00002263 | 2009649173 | 861159A |
| 200823CV | 00005886 | 00005876 | 200823CV | 00002272 | 00002263 | 2009649173 | 861159A |
| 200823CV | 00005889 | 00005876 | 200823CV | 00002269 | 00002263 | 2009649173 | 861159B |
| 200823CV | 00005891 | 00005876 | 200823CV | 00002269 | 00002263 | 2009649173 | 861159B |
| 200823CV | 00005892 | 00005876 | 200823CV | 00002269 | 00002263 | 2009649173 | 861159B |
| 200823CV | 00005893 | 00005876 | 200823CV | 00002269 | 00002263 | 2009649173 | 861159B |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925804 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005596 | 0.97 | 41.1 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005612 | 0.93 | 41.1 | 7.21 |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.90 | 41.1 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 0.93 | 46.9 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.98 | 46.9 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005685 | 0.87 | 46.9 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.84 | 52.0 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005771 | 0.84 | 52.0 | 8.2 |
| CV-BENTOMAT ST | 200823CV | 00005773 | 0.89 | 52.0 | 8.21 |
| CV-BENTOMAT ST | 200823CV | 00005779 | 0.89 | 52.0 | 7.8 |
| CV-BENTOMAT ST | 200823CV | 00005788 | 0.88 | 52.0 | 6 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.88 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005803 | 0.91 | 52.0 | 7 |
| CV-BENTOMAT ST | 200823CV | 00005811 | 0.91 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 0.89 | 68.1 | 6.4 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.86 | 68.1 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005847 | 0.96 | 68.1 | 5.7 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 0.97 | 68.1 | 5.5 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.91 | 68.1 | 4.8 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005596 | 17.9 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005612 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 17.9 | 26.0 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005685 | 16.1 | 29.0 |

| | | | | |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005771 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005773 | 15.8 | 30.0 |
| CV-BENTOMAT ST | 200823CV | 00005779 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005788 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005803 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005811 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 16.2 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005847 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 14.8 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.0 | 0.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925804 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586a | 28.0 | 16.0 |
| 859589A | 27.0 | 17.2 |
| 859589B | 27.0 | 16.8 |
| 859592A | 25.0 | 17.6 |
| 859592B | 26.0 | 17.8 |
| 861159B | 26.0 | 17.0 |
| 861159A | 26.0 | 16.4 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925804 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200817CV | 00001498 | 6.7 | 42.7 |
| CV-NON-WOVEN | 200817CV | 00001523 | 6.8 | 41.1 |
| CV-NON-WOVEN | 200818CV | 00001610 | 6.3 | 42.6 |
| CV-NON-WOVEN | 200818CV | 00001623 | 6.4 | 45.1 |
| CV-NON-WOVEN | 200818CV | 00001633 | 6.4 | 43.1 |
| CV-NON-WOVEN | 200823CV | 00002191 | 7.6 | 42.2 |
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |
| CV-NON-WOVEN | 200823CV | 00002220 | 6.7 | 20.9 |
| CV-NON-WOVEN | 200823CV | 00002238 | 6.8 | 42.4 |
| CV-NON-WOVEN | 200823CV | 00002263 | 6.3 | 31.9 |
| CV-NON-WOVEN | 200823CV | 00002273 | 7.5 | 44.5 |
| CV-NON-WOVEN | 200823CV | 00002279 | 6.4 | 38.9 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925804 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009649173 | 3.4 | 158.0 |
| PPX 82TEX | 2009941948 | 3.2 | 170.0 |
| PPX 82TEX | 2009990798 | 3.4 | 172.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005758 | 3.4 | 176.0 |
| PPX 82TEX | 2010005767 | 3.4 | 176.0 |
| PPX 82TEX | 2010147945 | 3.4 | 169.0 |
| PPX 82TEX | 2010147946 | 3.4 | 149.0 |
| PPX 82TEX | 2010152741 | 3.6 | 156.0 |
| PPX 82TEX | 2010242055 | 3.4 | 187.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124169 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124170 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124172 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124174 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124175 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124177 | 6.5 | 97.0 |

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.

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925808

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005677 | 150 | 15 | 2250 | 2754 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005723 | 150 | 15 | 2250 | 2778 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005725 | 150 | 15 | 2250 | 2794 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005727 | 150 | 15 | 2250 | 2800 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005733 | 150 | 15 | 2250 | 2766 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005744 | 150 | 15 | 2250 | 2766 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005751 | 150 | 15 | 2250 | 2768 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005756 | 150 | 15 | 2250 | 2762 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005757 | 150 | 15 | 2250 | 2774 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005758 | 150 | 15 | 2250 | 2786 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005759 | 150 | 15 | 2250 | 2766 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005760 | 150 | 15 | 2250 | 2766 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005762 | 150 | 15 | 2250 | 2758 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005764 | 150 | 15 | 2250 | 2766 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005765 | 150 | 15 | 2250 | 2744 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005766 | 150 | 15 | 2250 | 2766 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005770 | 150 | 15 | 2250 | 2802 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005774 | 150 | 15 | 2250 | 2758 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005775 | 150 | 15 | 2250 | 2742 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005776 | 150 | 15 | 2250 | 2742 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005777 | 150 | 15 | 2250 | 2768 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005778 | 150 | 15 | 2250 | 2746 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005786 | 150 | 15 | 2250 | 2734 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005788 | 150 | 15 | 2250 | 2747 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005789 | 150 | 15 | 2250 | 2744 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005794 | 150 | 15 | 2250 | 2754 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005796 | 150 | 15 | 2250 | 2776 |

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005799 | 150 | 15 | 2250 | 2774 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005804 | 150 | 15 | 2250 | 2750 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005805 | 150 | 15 | 2250 | 2772 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005806 | 150 | 15 | 2250 | 2780 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005807 | 150 | 15 | 2250 | 2776 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005808 | 150 | 15 | 2250 | 2756 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005835 | 150 | 15 | 2250 | 2710 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005836 | 150 | 15 | 2250 | 2840 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005839 | 150 | 15 | 2250 | 2762 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005840 | 150 | 15 | 2250 | 2780 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005842 | 150 | 15 | 2250 | 2770 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005847 | 150 | 15 | 2250 | 2900 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005855 | 150 | 15 | 2250 | 2808 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005856 | 150 | 15 | 2250 | 2780 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005857 | 150 | 15 | 2250 | 2798 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005859 | 150 | 15 | 2250 | 2778 |
| 023925811 | CV-BENTOMAT ST | 200823CV | 00005879 | 150 | 15 | 2250 | 2786 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005880 | 150 | 15 | 2250 | 2792 |
| 023925808 | CV-BENTOMAT ST | 200823CV | 00005881 | 150 | 15 | 2250 | 2782 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005882 | 150 | 15 | 2250 | 2778 |
| 023925813 | CV-BENTOMAT ST | 200823CV | 00005883 | 150 | 15 | 2250 | 2768 |
| | | | Totals: | **7200** | **720** | **108000** | **133067** |
| | | | | | | Total Number of Rolls Certified: **48** | |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925808

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
| 200823CV | 00005677 | 00005671 | 200823CV | 00002216 | 00002210 | 2010147739 | 859586A |
| 200823CV | 00005723 | 00005723 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005725 | 00005723 | 1010124179 | | | 2010004813 | 859586B |
| 200823CV | 00005727 | 00005723 | 1010124179 | | | 2010004813 | 859586B |
| 200823CV | 00005733 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005744 | 00005744 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005751 | 00005747 | 1010124176 | | | 2010005758 | 859586B |
| 200823CV | 00005756 | 00005755 | 1010124176 | | | 2010005758 | 859592A |
| 200823CV | 00005757 | 00005755 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005758 | 00005755 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005759 | 00005759 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005760 | 00005759 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005762 | 00005759 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005764 | 00005763 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005765 | 00005763 | 1010124170 | | | 2010005758 | 859592A |
| 200823CV | 00005766 | 00005763 | 1010124172 | | | 2010005758 | 859592A |
| 200823CV | 00005770 | 00005763 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005774 | 00005773 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005775 | 00005773 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005776 | 00005773 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005777 | 00005773 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005778 | 00005773 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005786 | 00005779 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005788 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005789 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005794 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005796 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005799 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005804 | 00005803 | 1010124177 | | | 2009941948 | 859592B |

| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
|---|---|---|---|---|---|---|---|
| 200823CV | 00005805 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005806 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005807 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005808 | 00005803 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005835 | 00005832 | 200823CV | 00002278 | 00002273 | 2010147945 | 859592B |
| 200823CV | 00005836 | 00005832 | 200823CV | 00002278 | 00002273 | 2010147945 | 859592B |
| 200823CV | 00005839 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005840 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005842 | 00005832 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005847 | 00005847 | 200823CV | 00002274 | 00002273 | 2010147945 | 861159A |
| 200823CV | 00005855 | 00005847 | 200823CV | 00002279 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005856 | 00005847 | 200823CV | 00002279 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005857 | 00005847 | 200823CV | 00002279 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005859 | 00005847 | 200823CV | 00002279 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005879 | 00005876 | 200823CV | 00002282 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005880 | 00005876 | 200823CV | 00002282 | 00002279 | 2009990798 | 861159A |
| 200823CV | 00005881 | 00005876 | 200823CV | 00002272 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005882 | 00005876 | 200823CV | 00002272 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005883 | 00005876 | 200823CV | 00002272 | 00002263 | 2009990798 | 861159A |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925808 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.82 | 46.9 | 9.8 |
| CV-BENTOMAT ST | 200823CV | 00005723 | 0.95 | 42.8 | 8.1 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.96 | 52.0 | 6.6 |
| CV-BENTOMAT ST | 200823CV | 00005744 | 0.85 | 52.0 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005747 | 0.85 | 52.0 | 5.6 |
| CV-BENTOMAT ST | 200823CV | 00005755 | 0.85 | 52.0 | 7.1 |
| CV-BENTOMAT ST | 200823CV | 00005759 | 0.84 | 52.0 | 5.5 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.84 | 52.0 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005773 | 0.89 | 52.0 | 8.21 |
| CV-BENTOMAT ST | 200823CV | 00005779 | 0.89 | 52.0 | 7.8 |
| CV-BENTOMAT ST | 200823CV | 00005788 | 0.88 | 52.0 | 6 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.88 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005803 | 0.91 | 52.0 | 7 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.86 | 68.1 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005847 | 0.96 | 68.1 | 5.7 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.91 | 68.1 | 4.8 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005723 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005744 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005747 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005755 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005759 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005773 | 15.8 | 30.0 |
| CV-BENTOMAT ST | 200823CV | 00005779 | 0.0 | 0.0 |

| | | | | |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005788 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005803 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005847 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.0 | 0.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925808 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586a | 28.0 | 16.0 |
| 859586b | 28.0 | 15.8 |
| 859592A | 25.0 | 17.6 |
| 859592B | 26.0 | 17.8 |
| 861159A | 26.0 | 16.4 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925808 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |
| CV-NON-WOVEN | 200823CV | 00002263 | 6.3 | 31.9 |
| CV-NON-WOVEN | 200823CV | 00002273 | 7.5 | 44.5 |
| CV-NON-WOVEN | 200823CV | 00002279 | 6.4 | 38.9 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925808 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009941948 | 3.2 | 170.0 |
| PPX 82TEX | 2009990798 | 3.4 | 172.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005758 | 3.4 | 176.0 |
| PPX 82TEX | 2010147739 | 3.4 | 169.0 |
| PPX 82TEX | 2010147945 | 3.4 | 169.0 |
| PPX 82TEX | 2010242055 | 3.4 | 187.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124169 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124170 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124171 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124172 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124173 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124174 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124175 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124176 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124177 | 6.5 | 97.0 |
| DALCO 6osy-natural | 1010124178 | 6.5 | 97.0 |
| DALCO 6osy-natural | 1010124179 | 6.5 | 97.0 |

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.

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925812

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005631 | 150 | 15 | 2250 | 2840 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005680 | 150 | 15 | 2250 | 2992 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005710 | 150 | 15 | 2250 | 2754 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005719 | 150 | 15 | 2250 | 2770 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005722 | 150 | 15 | 2250 | 2748 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005728 | 150 | 15 | 2250 | 2812 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005732 | 150 | 15 | 2250 | 2788 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005735 | 150 | 15 | 2250 | 2768 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005746 | 150 | 15 | 2250 | 2766 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005747 | 150 | 15 | 2250 | 2772 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005748 | 150 | 15 | 2250 | 2768 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005749 | 150 | 15 | 2250 | 2752 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005752 | 150 | 15 | 2250 | 2766 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005753 | 150 | 15 | 2250 | 2774 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005754 | 150 | 15 | 2250 | 2776 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005755 | 150 | 15 | 2250 | 2794 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005768 | 150 | 15 | 2250 | 2954 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005779 | 150 | 15 | 2250 | 2772 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005780 | 150 | 15 | 2250 | 2736 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005791 | 150 | 15 | 2250 | 2752 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005792 | 150 | 15 | 2250 | 2758 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005795 | 150 | 15 | 2250 | 2764 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005797 | 150 | 15 | 2250 | 2774 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005800 | 150 | 15 | 2250 | 2730 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005827 | 150 | 15 | 2250 | 2776 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005833 | 150 | 15 | 2250 | 2738 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005862 | 150 | 15 | 2250 | 2732 |

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005863 | 150 | 15 | 2250 | 2710 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005864 | 150 | 15 | 2250 | 2800 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005884 | 150 | 15 | 2250 | 2754 |
| 023925814 | CV-BENTOMAT ST | 200823CV | 00005887 | 150 | 15 | 2250 | 2808 |
| 023925812 | CV-BENTOMAT ST | 200823CV | 00005888 | 150 | 15 | 2250 | 2786 |
| | | | Totals: | **4800** | **480** | **72000** | **88984** |
| | | | | Total Number of Rolls Certified: **32** | | | |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925812

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
| 200823CV | 00005631 | 00005627 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005680 | 00005671 | 200823CV | 00002212 | 00002210 | 2010147739 | 859586A |
| 200823CV | 00005710 | 00005700 | 200823CV | 00002204 | 00002201 | 2010004813 | 859586B |
| 200823CV | 00005719 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005722 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005728 | 00005723 | 1010124179 | | | 2010004813 | 859586B |
| 200823CV | 00005732 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005735 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005746 | 00005744 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005747 | 00005747 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005748 | 00005747 | 1010124176 | | | 2010005758 | 859586B |
| 200823CV | 00005749 | 00005747 | 1010124176 | | | 2010005758 | 859586B |
| 200823CV | 00005752 | 00005747 | 1010124176 | | | 2010005758 | 859592A |
| 200823CV | 00005753 | 00005747 | 1010124176 | | | 2010005758 | 859592A |
| 200823CV | 00005754 | 00005747 | 1010124176 | | | 2010005758 | 859592A |
| 200823CV | 00005755 | 00005755 | 1010124176 | | | 2010005758 | 859592A |
| 200823CV | 00005768 | 00005763 | 1010124172 | | | 2010242055 | 859592A |
| 200823CV | 00005779 | 00005779 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005780 | 00005779 | 1010124175 | | | 2010242055 | 859592A |
| 200823CV | 00005791 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005792 | 00005788 | 1010124174 | | | 2010242055 | 859592A |
| 200823CV | 00005795 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005797 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005800 | 00005795 | 1010124169 | | | 2010242055 | 859592B |
| 200823CV | 00005827 | 00005817 | 200823CV | 00002214 | 00002210 | 2009941948 | 859592B |
| 200823CV | 00005833 | 00005832 | 200823CV | 00002278 | 00002273 | 2009941948 | 859592B |
| 200823CV | 00005862 | 00005861 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005863 | 00005861 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005864 | 00005861 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |

| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
|---|---|---|---|---|---|---|---|
| 200823CV | 00005884 | 00005876 | 200823CV | 00002272 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005887 | 00005876 | 200823CV | 00002272 | 00002263 | 2009649173 | 861159A |
| 200823CV | 00005888 | 00005876 | 200823CV | 00002269 | 00002263 | 2009649173 | 861159B |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925812 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.90 | 41.1 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.82 | 46.9 | 9.8 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.95 | 42.8 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005723 | 0.95 | 42.8 | 8.1 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.96 | 52.0 | 6.6 |
| CV-BENTOMAT ST | 200823CV | 00005744 | 0.85 | 52.0 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005747 | 0.85 | 52.0 | 5.6 |
| CV-BENTOMAT ST | 200823CV | 00005755 | 0.85 | 52.0 | 7.1 |
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.84 | 52.0 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005779 | 0.89 | 52.0 | 7.8 |
| CV-BENTOMAT ST | 200823CV | 00005788 | 0.88 | 52.0 | 6 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.88 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 0.89 | 68.1 | 6.4 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.86 | 68.1 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 0.97 | 68.1 | 5.5 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.91 | 68.1 | 4.8 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005723 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005744 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005747 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005755 | 0.0 | 0.0 |

| | | | | |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005763 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005779 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005788 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005795 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 16.2 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005832 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 14.8 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.0 | 0.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925812 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586A | 28.0 | 16.0 |
| 859586B | 28.0 | 15.8 |
| 859589B | 27.0 | 16.8 |
| 859592A | 25.0 | 17.6 |
| 859592B | 26.0 | 17.8 |
| 861159B | 26.0 | 17.0 |
| 861159A | 26.0 | 16.4 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925812 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200818CV | 00001610 | 6.3 | 42.6 |
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |
| CV-NON-WOVEN | 200823CV | 00002263 | 6.3 | 31.9 |
| CV-NON-WOVEN | 200823CV | 00002273 | 7.5 | 44.5 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925812 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009649173 | 3.4 | 158.0 |
| PPX 82TEX | 2009941948 | 3.2 | 170.0 |
| PPX 82TEX | 2009990798 | 3.4 | 172.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005758 | 3.4 | 176.0 |
| PPX 82TEX | 2010147739 | 3.4 | 169.0 |
| PPX 82TEX | 2010147946 | 3.4 | 149.0 |
| PPX 82TEX | 2010242055 | 3.4 | 187.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124169 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124171 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124172 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124173 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124174 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124175 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124176 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124178 | 6.5 | 97.0 |
| DALCO 6osy-natural | 1010124179 | 6.5 | 97.0 |

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.

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925815

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005610 | 150 | 15 | 2250 | 2866 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005611 | 150 | 15 | 2250 | 2854 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005629 | 150 | 15 | 2250 | 2840 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005630 | 150 | 15 | 2250 | 2840 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005655 | 150 | 15 | 2250 | 2882 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005708 | 150 | 15 | 2250 | 2820 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005709 | 150 | 15 | 2250 | 2846 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005714 | 150 | 15 | 2250 | 3046 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005715 | 150 | 15 | 2250 | 2848 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005724 | 150 | 15 | 2250 | 2802 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005726 | 150 | 15 | 2250 | 2794 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005738 | 150 | 15 | 2250 | 2770 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005741 | 150 | 15 | 2250 | 2764 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005745 | 150 | 15 | 2250 | 2766 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005865 | 150 | 15 | 2250 | 2782 |
| 023925815 | CV-BENTOMAT ST | 200823CV | 00005890 | 150 | 15 | 2250 | 2860 |
| | | | Totals: | **2400** | **240** | **36000** | **45380** |
| | | | | | | Total Number of Rolls Certified: **16** | |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925815

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| **GCL Lot #** | **GCL Roll #** | **Roll # Tested** | **Cap Lot #** | **Cap Roll #** | **Roll # Tested** | **Base Roll #** | **Clay Lot #** |
| 200823CV | 00005610 | 00005596 | 200817CV | 00001499 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005611 | 00005596 | 200817CV | 00001499 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005629 | 00005627 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005630 | 00005627 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005655 | 00005641 | 200823CV | 00002241 | 00002238 | 2010147946 | 859589B |
| 200823CV | 00005708 | 00005700 | 200823CV | 00002204 | 00002201 | 2010004813 | 859586B |
| 200823CV | 00005709 | 00005700 | 200823CV | 00002204 | 00002201 | 2010004813 | 859586B |
| 200823CV | 00005714 | 00005700 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005715 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005724 | 00005723 | 1010124179 | | | 2010004813 | 859586B |
| 200823CV | 00005726 | 00005723 | 1010124179 | | | 2010004813 | 859586B |
| 200823CV | 00005738 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005741 | 00005739 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005745 | 00005744 | 1010124178 | | | 2010005758 | 859586B |
| 200823CV | 00005865 | 00005861 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |
| 200823CV | 00005890 | 00005876 | 200823CV | 00002269 | 00002263 | 2009649173 | 861159B |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925815 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005596 | 0.97 | 41.1 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.90 | 41.1 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 0.93 | 46.9 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.95 | 42.8 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005723 | 0.95 | 42.8 | 8.1 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.96 | 52.0 | 6.6 |
| CV-BENTOMAT ST | 200823CV | 00005739 | 0.96 | 52.0 | 5.7 |
| CV-BENTOMAT ST | 200823CV | 00005744 | 0.85 | 52.0 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 0.97 | 68.1 | 5.5 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.91 | 68.1 | 4.8 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005596 | 17.9 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 17.9 | 26.0 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005723 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005739 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005744 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 14.8 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005876 | 0.0 | 0.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925815 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586b | 28.0 | 15.8 |
| 859589A | 27.0 | 17.2 |
| 859589B | 27.0 | 16.8 |
| 861159B | 26.0 | 17.0 |
| 861159A | 26.0 | 16.4 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925815 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200817CV | 00001498 | 6.7 | 42.7 |
| CV-NON-WOVEN | 200818CV | 00001610 | 6.3 | 42.6 |
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002238 | 6.8 | 42.4 |
| CV-NON-WOVEN | 200823CV | 00002263 | 6.3 | 31.9 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925815 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009649173 | 3.4 | 158.0 |
| PPX 82TEX | 2009990798 | 3.4 | 172.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005758 | 3.4 | 176.0 |
| PPX 82TEX | 2010147946 | 3.4 | 149.0 |
| PPX 82TEX | 2010152741 | 3.6 | 156.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124171 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124173 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124178 | 6.5 | 97.0 |
| DALCO 6osy-natural | 1010124179 | 6.5 | 97.0 |

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.

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925816

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005613 | 150 | 15 | 2250 | 2856 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005624 | 150 | 15 | 2250 | 2812 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005625 | 150 | 15 | 2250 | 2818 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005626 | 150 | 15 | 2250 | 2800 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005644 | 150 | 15 | 2250 | 2788 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005648 | 150 | 15 | 2250 | 2792 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005649 | 150 | 15 | 2250 | 2776 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005650 | 150 | 15 | 2250 | 2812 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005661 | 150 | 15 | 2250 | 2870 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005685 | 150 | 15 | 2250 | 2746 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005692 | 150 | 15 | 2250 | 2744 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005698 | 150 | 15 | 2250 | 2742 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005704 | 150 | 15 | 2250 | 2800 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005739 | 150 | 15 | 2250 | 2816 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005819 | 150 | 15 | 2250 | 2828 |
| 023925816 | CV-BENTOMAT ST | 200823CV | 00005866 | 150 | 15 | 2250 | 2776 |
| | | | Totals: | **2400** | **240** | **36000** | **44776** |
| | | | | Total Number of Rolls Certified: **16** | | | |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925816

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| **GCL Lot #** | **GCL Roll #** | **Roll # Tested** | **Cap Lot #** | **Cap Roll #** | **Roll # Tested** | **Base Roll #** | **Clay Lot #** |
| 200823CV | 00005613 | 00005612 | 200823CV | 00002199 | 00002191 | 2010152741 | 859589A |
| 200823CV | 00005624 | 00005612 | 200818CV | 00001631 | 00001623 | 2010152741 | 859589B |
| 200823CV | 00005625 | 00005612 | 200818CV | 00001631 | 00001623 | 2010147946 | 859589B |
| 200823CV | 00005626 | 00005612 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005644 | 00005641 | 200818CV | 00001611 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005648 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005649 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005650 | 00005641 | 200817CV | 00001530 | 00001523 | 2010147946 | 859589B |
| 200823CV | 00005661 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859589B |
| 200823CV | 00005685 | 00005685 | 200823CV | 00002212 | 00002210 | 2010005767 | 859586A |
| 200823CV | 00005692 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005698 | 00005685 | 200823CV | 00002208 | 00002201 | 2010005767 | 859586A |
| 200823CV | 00005704 | 00005700 | 200823CV | 00002209 | 00002201 | 2010004813 | 859586A |
| 200823CV | 00005739 | 00005739 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005819 | 00005817 | 200823CV | 00002205 | 00002201 | 2009941948 | 859592B |
| 200823CV | 00005866 | 00005861 | 200823CV | 00002271 | 00002263 | 2009990798 | 861159A |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925816 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005612 | 0.93 | 41.1 | 7.21 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 0.93 | 46.9 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.98 | 46.9 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005685 | 0.87 | 46.9 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005739 | 0.96 | 52.0 | 5.7 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 0.89 | 68.1 | 6.4 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 0.97 | 68.1 | 5.5 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005612 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 17.9 | 26.0 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005685 | 16.1 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005739 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 16.2 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005861 | 14.8 | 29.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925816 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586a | 28.0 | 16.0 |
| 859586b | 28.0 | 15.8 |
| 859589A | 27.0 | 17.2 |
| 859589B | 27.0 | 16.8 |
| 859592B | 26.0 | 17.8 |
| 861159A | 26.0 | 16.4 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925816 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200817CV | 00001523 | 6.8 | 41.1 |
| CV-NON-WOVEN | 200818CV | 00001610 | 6.3 | 42.6 |
| CV-NON-WOVEN | 200818CV | 00001623 | 6.4 | 45.1 |
| CV-NON-WOVEN | 200823CV | 00002191 | 7.6 | 42.2 |
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |
| CV-NON-WOVEN | 200823CV | 00002220 | 6.7 | 20.9 |
| CV-NON-WOVEN | 200823CV | 00002263 | 6.3 | 31.9 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925816 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009941948 | 3.2 | 170.0 |
| PPX 82TEX | 2009990798 | 3.4 | 172.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010005767 | 3.4 | 176.0 |
| PPX 82TEX | 2010147946 | 3.4 | 149.0 |
| PPX 82TEX | 2010152741 | 3.6 | 156.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124173 | 6.0 | 81.0 |

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.

# GCL TEST RESULTS

**TRI Client: CETCO**
**Project: Charlotte Motor Speedway**

**Material: Bentomat ST GCL**
**Index Flux (ASTM D 5887)**
**TRI Log #: E2312-32-02**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | MEAN | STD. DEV. | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Identification: 5596** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.4E-09 | | | | | | | | | | 2.4E-09 | | |
| Hydraulic Conductivity (cm/sec) | 1.8E-09 | | | | | | | | | | 1.8E-09 | | 5.0E-9 max |
| **Sample Identification: 5641** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.3E-09 | | | | | | | | | | 2.3E-09 | | |
| Hydraulic Conductivity (cm/sec) | 1.8E-09 | | | | | | | | | | 1.8E-09 | | 5.0E-9 max |
| **Sample Identification: 5685** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.7E-09 | | | | | | | | | | 2.7E-09 | | |
| Hydraulic Conductivity (cm/sec) | 2.0E-09 | | | | | | | | | | 2.0E-09 | | 5.0E-9 max |
| **Sample Identification: 5729** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.7E-09 | | | | | | | | | | 2.7E-09 | | |
| Hydraulic Conductivity (cm/sec) | 2.2E-09 | | | | | | | | | | 2.2E-09 | | 5.0E-9 max |
| **Sample Identification: 5773** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.6E-09 | | | | | | | | | | 2.6E-09 | | |
| Hydraulic Conductivity (cm/sec) | 2.1E-09 | | | | | | | | | | 2.1E-09 | | 5.0E-9 max |
| **Sample Identification: 5817** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.1E-09 | | | | | | | | | | 2.1E-09 | | |
| Hydraulic Conductivity (cm/sec) | 1.5E-09 | | | | | | | | | | 1.5E-09 | | 5.0E-9 max |
| **Sample Identification: 5861** | | | | | | | | | | | | | |
| Index Flux ($m^3/m^2/sec$) | 2.6E-09 | | | | | | | | | | 2.6E-09 | | |
| Hydraulic Conductivity (cm/sec) | 2.0E-09 | | | | | | | | | | 2.0E-09 | | 5.0E-9 max |

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

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## GCL ORDER PACKING LIST

GCL shipped for certification package number 023925817

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005596 | 150 | 15 | 2250 | 3350 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005598 | 150 | 15 | 2250 | 2906 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005599 | 150 | 15 | 2250 | 2864 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005600 | 150 | 15 | 2250 | 2852 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005601 | 150 | 15 | 2250 | 2866 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005602 | 150 | 15 | 2250 | 2828 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005603 | 150 | 15 | 2250 | 2850 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005604 | 150 | 15 | 2250 | 2854 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005606 | 150 | 15 | 2250 | 2860 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005607 | 150 | 15 | 2250 | 2856 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005614 | 150 | 15 | 2250 | 2852 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005617 | 150 | 15 | 2250 | 2822 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005618 | 150 | 15 | 2250 | 2822 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005619 | 150 | 15 | 2250 | 2866 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005620 | 150 | 15 | 2250 | 2834 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005623 | 150 | 15 | 2250 | 2832 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005627 | 150 | 15 | 2250 | 2856 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005632 | 150 | 15 | 2250 | 2840 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005633 | 150 | 15 | 2250 | 2830 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005634 | 150 | 15 | 2250 | 2822 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005635 | 150 | 15 | 2250 | 2916 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005639 | 150 | 15 | 2250 | 2848 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005654 | 150 | 15 | 2250 | 2872 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005664 | 150 | 15 | 2250 | 2860 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005671 | 150 | 15 | 2250 | 2948 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005707 | 150 | 15 | 2250 | 2834 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005713 | 150 | 15 | 2250 | 3042 |

| Order # | Product | Lot Number | Roll Number | Length (ft) | Width (ft) | Square Ft | Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005716 | 150 | 15 | 2250 | 2770 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005730 | 150 | 15 | 2250 | 2798 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005731 | 150 | 15 | 2250 | 2898 |
| 023925818 | CV-BENTOMAT ST | 200823CV | 00005811 | 150 | 15 | 2250 | 2748 |
| 023925817 | CV-BENTOMAT ST | 200823CV | 00005818 | 150 | 15 | 2250 | 2798 |
| | | | Totals: | **4800** | **480** | **72000** | **91794** |
| | | | | | | | Total Number of Rolls Certified: **32** |

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## GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 023925817

| GCL | | | Geotextiles | | | | Clay |
|---|---|---|---|---|---|---|---|
| CV-BENTOMAT ST | | | CV-N/W-WHITE-ST | | | CV-WOVEN-ST | CV-CG 50-ST |
| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
| 200823CV | 00005596 | 00005596 | 200823CV | 00002232 | 00002228 | 2010152741 | 859589A |
| 200823CV | 00005598 | 00005596 | 200823CV | 00002232 | 00002228 | 2010152741 | 859589A |
| 200823CV | 00005599 | 00005596 | 200823CV | 00002232 | 00002228 | 2010152741 | 859589A |
| 200823CV | 00005600 | 00005596 | 200817CV | 00001500 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005601 | 00005596 | 200817CV | 00001500 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005602 | 00005596 | 200817CV | 00001500 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005603 | 00005596 | 200817CV | 00001500 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005604 | 00005596 | 200817CV | 00001500 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005606 | 00005596 | 200817CV | 00001499 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005607 | 00005596 | 200817CV | 00001499 | 00001498 | 2010152741 | 859589A |
| 200823CV | 00005614 | 00005612 | 200823CV | 00002199 | 00002191 | 2010152741 | 859589A |
| 200823CV | 00005617 | 00005612 | 200823CV | 00002199 | 00002191 | 2010152741 | 859589A |
| 200823CV | 00005618 | 00005612 | 200823CV | 00002199 | 00002191 | 2010152741 | 859589A |
| 200823CV | 00005619 | 00005612 | 200818CV | 00001631 | 00001623 | 2010152741 | 859589A |
| 200823CV | 00005620 | 00005612 | 200818CV | 00001631 | 00001623 | 2010152741 | 859589A |
| 200823CV | 00005623 | 00005612 | 200818CV | 00001631 | 00001623 | 2010152741 | 859589B |
| 200823CV | 00005627 | 00005627 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005632 | 00005627 | 200818CV | 00001610 | 00001610 | 2010147946 | 859589B |
| 200823CV | 00005633 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005634 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005635 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005639 | 00005627 | 200818CV | 00001637 | 00001633 | 2010147946 | 859589B |
| 200823CV | 00005654 | 00005641 | 200823CV | 00002241 | 00002238 | 2010147946 | 859589B |
| 200823CV | 00005664 | 00005656 | 200823CV | 00002223 | 00002220 | 2010147946 | 859586A |
| 200823CV | 00005671 | 00005671 | 200823CV | 00002238 | 00002238 | 2010147946 | 859586A |
| 200823CV | 00005707 | 00005700 | 200823CV | 00002204 | 00002201 | 2010004813 | 859586B |
| 200823CV | 00005713 | 00005700 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005716 | 00005715 | 1010124171 | | | 2010004813 | 859586B |
| 200823CV | 00005730 | 00005729 | 1010124173 | | | 2010004813 | 859586B |

| GCL Lot # | GCL Roll # | Roll # Tested | Cap Lot # | Cap Roll # | Roll # Tested | Base Roll # | Clay Lot # |
|---|---|---|---|---|---|---|---|
| 200823CV | 00005731 | 00005731 | 1010124173 | | | 2010004813 | 859586B |
| 200823CV | 00005811 | 00005811 | 1010124177 | | | 2009941948 | 859592B |
| 200823CV | 00005818 | 00005817 | 200823CV | 00002217 | 00002210 | 2009941948 | 859592B |

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## GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 023925817 have been tested in our production facility lab.

| Product | Lot # Tested | Roll # Tested | Mass Area | Grab Strength | Peel Strength |
|---|---|---|---|---|---|
| | | Standard Test Method: | ASTM D 5993 | ASTM D 6768 | ASTM D 6496 |
| | | Standard Specification: | 0.75 lb/sq ft MARV | 30lbs/in MARV | 3.5lbs/in MARV |
| Non-standard specifications were requested for this order as indicated on the attatched property sheet | | | | | |
| CV-BENTOMAT ST | 200823CV | 00005596 | 0.97 | 41.1 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005612 | 0.93 | 41.1 | 7.21 |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.90 | 41.1 | 5.9 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 0.93 | 46.9 | 5.8 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.98 | 46.9 | 6.2 |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.82 | 46.9 | 9.8 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.97 | 46.9 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.95 | 42.8 | 7.5 |
| CV-BENTOMAT ST | 200823CV | 00005729 | 0.96 | 52.0 | 5.6 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.96 | 52.0 | 6.6 |
| CV-BENTOMAT ST | 200823CV | 00005811 | 0.91 | 52.0 | 7.2 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 0.89 | 68.1 | 6.4 |

| Product | Lot # Tested | Roll # Tested | Fluid Loss | Free Swell |
|---|---|---|---|---|
| CV-BENTOMAT ST | 200823CV | 00005596 | 17.9 | 29.0 |
| CV-BENTOMAT ST | 200823CV | 00005612 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005627 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005641 | 17.9 | 26.0 |
| CV-BENTOMAT ST | 200823CV | 00005656 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005671 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005700 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005715 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005729 | 15.7 | 30.0 |
| CV-BENTOMAT ST | 200823CV | 00005731 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005811 | 0.0 | 0.0 |
| CV-BENTOMAT ST | 200823CV | 00005817 | 16.2 | 29.0 |

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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## BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 023925817 has been tested by American Colloid Company and yeilded the following test results.

| Reference | Swell | Fluid Loss |
|---|---|---|
| Test Method: | ASTM D 5890 | ASTM D 5891 |
| Specification: | 24 Min | 18 ml Max |
| 859586a | 28.0 | 16.0 |
| 859586b | 28.0 | 15.8 |
| 859589A | 27.0 | 17.2 |
| 859589B | 27.0 | 16.8 |
| 859592B | 26.0 | 17.8 |

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## GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 023925817 was manufactured using these geotextiles:

| Material | Lot # | Roll # | Mass Area | Grab Strenth |
|---|---|---|---|---|
| CV-NON-WOVEN | 200817CV | 00001498 | 6.7 | 42.7 |
| CV-NON-WOVEN | 200818CV | 00001610 | 6.3 | 42.6 |
| CV-NON-WOVEN | 200818CV | 00001623 | 6.4 | 45.1 |
| CV-NON-WOVEN | 200818CV | 00001633 | 6.4 | 43.1 |
| CV-NON-WOVEN | 200823CV | 00002191 | 7.6 | 42.2 |
| CV-NON-WOVEN | 200823CV | 00002201 | 7.6 | 52.5 |
| CV-NON-WOVEN | 200823CV | 00002210 | 6.4 | 32.2 |
| CV-NON-WOVEN | 200823CV | 00002220 | 6.7 | 20.9 |
| CV-NON-WOVEN | 200823CV | 00002228 | 6.9 | 43.4 |
| CV-NON-WOVEN | 200823CV | 00002238 | 6.8 | 42.4 |

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## GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 023925817 was manufactured with geotextiles which were tested with the following results.

**BASE**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| PPX 82TEX | 2009941948 | 3.2 | 170.0 |
| PPX 82TEX | 2010004813 | 3.5 | 156.0 |
| PPX 82TEX | 2010147946 | 3.4 | 149.0 |
| PPX 82TEX | 2010152741 | 3.6 | 156.0 |

**CAP**

| Material | Roll Number | Mass Area oz/yd2 | Grab Strenth lbs |
|---|---|---|---|
| DALCO 6osy-natural | 1010124171 | 6.5 | 98.0 |
| DALCO 6osy-natural | 1010124173 | 6.0 | 81.0 |
| DALCO 6osy-natural | 1010124177 | 6.5 | 97.0 |

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.

of NORTH CAROLINA, PLLC

# SECTION E-3
## Geocomposite

Geocomposite Quality Certification

Customer: Allied Waste Industries
PO#: to be given Charlotte Motor Spdwy
Destination: Concord, NC
doc #: 10450

Agru America
500 Garrison Road
Georgetown, SC 29440
ph: 843-546-0600

Quality Control Manager

agru america quality control dept.

Agru America certifies the following results for the above project:

Type: 8-275-8
textile

| | roll # | wid | len | area | SIDE | TEX. ROLL # | SIDE | TEX. ROLL # | COMP ASTM D7005 PLY-A | COMP ASTM D7005 PLY-B | COMP ASTM D4716 Trans* | NET ASTM D5199 lo | NET ASTM D5199 hi | NET ASTM D5199 ave | NET ASTM D4218 Car | NET ASTM D792 Den | NET ASTM D5035 Ten | NET ASTM D5261 M/U | NET ASTM D4716 Trans** | Resin Lot # | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ft | ft | sqft | | | | | lb/in | lb/in | m²/sec | mil | mil | mil | % | g/cc | lb/in | lb/ft² | m²/sec | | |
| 1. | 526273 .08 | 14.5 | 200 | 2900 | A | 1010134598 | B | 1010134616 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | conf |
| 2. | 526274 .08 | 14.5 | 200 | 2900 | A | 1010134598 | B | 1010134616 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 3. | 526279 .08 | 14.5 | 200 | 2900 | A | 1010134598 | B | 1010134616 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 4. | 526380 .08 | 14.5 | 200 | 2900 | A | 1010134618 | B | 1010134600 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 5. | 526381 .08 | 14.5 | 200 | 2900 | A | 1010134618 | B | 1010134600 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 6. | 526382 .08 | 14.5 | 200 | 2900 | A | 1010134618 | B | 1010134600 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 7. | 526383 .08 | 14.5 | 200 | 2900 | A | 1010134618 | B | 1010134600 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 8. | 526384 .08 | 14.5 | 200 | 2900 | A | 1010134597 | B | 1010134605 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 9. | 526385 .08 | 14.5 | 200 | 2900 | A | 1010134597 | B | 1010134605 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 10. | 526386 .08 | 14.5 | 200 | 2900 | A | 1010134597 | B | 1010134605 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 11. | 526387 .08 | 14.5 | 200 | 2900 | A | 1010134658 | B | 1010134620 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 12. | 526388 .08 | 14.5 | 200 | 2900 | A | 1010134658 | B | 1010134620 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 13. | 526389 .08 | 14.5 | 200 | 2900 | A | 1010134658 | B | 1010134620 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 14. | 526390 .08 | 14.5 | 200 | 2900 | A | 1010134658 | B | 1010134620 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 15. | 526391 .08 | 14.5 | 200 | 2900 | A | 1010134596 | B | 1010134663 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 16. | 526392 .08 | 14.5 | 200 | 2900 | A | 1010134596 | B | 1010134663 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 17. | 526393 .08 | 14.5 | 200 | 2900 | A | 1010134596 | B | 1010134663 | 4.71 | 4.10 | 2.72 x 10-4 | 280 | 304 | 290 | 2.22 | 0.954 | 104.0 | 0.27 | 1.24x10$^{-2}$ | 08C1236 | |
| 18. | 526397 .08 | 14.5 | 200 | 2900 | A | 1010134610 | B | 1010134615 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 19. | 526398 .08 | 14.5 | 200 | 2900 | A | 1010134610 | B | 1010134615 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 20. | 526399 .08 | 14.5 | 200 | 2900 | A | 1010134610 | B | 1010134615 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 21. | 526300 .08 | 14.5 | 200 | 2900 | A | 1010134610 | B | 1010134615 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 22. | 526301 .08 | 14.5 | 200 | 2900 | A | 1010134606 | B | 1010134607 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 23. | 526302 .08 | 14.5 | 200 | 2900 | A | 1010134606 | B | 1010134607 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 24. | 526303 .08 | 14.5 | 200 | 2900 | A | 1010134606 | B | 1010134607 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 25. | 526304 .08 | 14.5 | 200 | 2900 | A | 1010134608 | B | 1010134612 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 26. | 526305 .08 | 14.5 | 200 | 2900 | A | 1010134608 | B | 1010134612 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 27. | 526306 .08 | 14.5 | 200 | 2900 | A | 1010134608 | B | 1010134612 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 28. | 526307 .08 | 14.5 | 200 | 2900 | A | 1010134611 | B | 1010134602 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 29. | 526308 .08 | 14.5 | 200 | 2900 | A | 1010134611 | B | 1010134602 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 30. | 526309 .08 | 14.5 | 200 | 2900 | A | 1010134611 | B | 1010134602 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 31. | 526310 .08 | 14.5 | 200 | 2900 | A | 1010134611 | B | 1010134609 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 32. | 526311 .08 | 14.5 | 200 | 2900 | A | 1010134601 | B | 1010134609 | 4.05 | 3.63 | 2.72 x 10-4 | 295 | 284 | 290 | 2.19 | 0.950 | 107.6 | 0.32 | 1.24x10$^{-2}$ | 08C1236 | |
| 33. | 526318 .08 | 14.5 | 200 | 2900 | A | 1010134604 | B | 1010134614 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1236 | |
| 34. | 526319 .08 | 14.5 | 200 | 2900 | A | 1010134604 | B | 1010134614 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 35. | 526320 .08 | 14.5 | 200 | 2900 | A | 1010134603 | B | 1010134614 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 36. | 526321 .08 | 14.5 | 200 | 2900 | A | 1010134603 | B | 1010134664 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 37. | 526322 .08 | 14.5 | 200 | 2900 | A | 1010134603 | B | 1010134664 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 38. | 526323 .08 | 14.5 | 200 | 2900 | A | 1010134603 | B | 1010134664 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 39. | 526324 .08 | 14.5 | 200 | 2900 | A | 1010134644 | B | 1010134664 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 40. | 526325 .08 | 14.5 | 200 | 2900 | A | 1010134644 | B | 1010134650 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 41. | 526326 .08 | 14.5 | 200 | 2900 | A | 1010134644 | B | 1010134650 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 42. | 526327 .08 | 14.5 | 200 | 2900 | A | 1010134644 | B | 1010134650 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 43. | 526328 .08 | 14.5 | 200 | 2900 | A | 1010134652 | B | 1010134650 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 44. | 526329 .08 | 14.5 | 200 | 2900 | A | 1010134652 | B | 1010134738 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 45. | 526330 .08 | 14.5 | 200 | 2900 | A | 1010134652 | B | 1010134738 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 46. | 526331 .08 | 14.5 | 200 | 2900 | A | 1010134652 | B | 1010134738 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 47. | 526332 .08 | 14.5 | 200 | 2900 | A | 1010134643 | B | 1010134738 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 48. | 526333 .08 | 14.5 | 200 | 2900 | A | 1010134643 | B | 1010134742 | 5.55 | 3.69 | 2.72 x 10-4 | 280 | 293 | 286 | 2.23 | 0.954 | 101.6 | 0.26 | 1.24x10$^{-2}$ | 08C1238 | |
| 49. | 526337 .08 | 14.5 | 200 | 2900 | A | 1010134643 | B | 1010134742 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |
| 50. | 526338 .08 | 14.5 | 200 | 2900 | A | 1010134643 | B | 1010134742 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |
| 51. | 526339 .08 | 14.5 | 200 | 2900 | A | 1010134619 | B | 1010134735 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |
| 52. | 526340 .08 | 14.5 | 200 | 2900 | A | 1010134619 | B | 1010134735 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |
| 53. | 526441 .08 | 14.5 | 200 | 2900 | A | 1010134619 | B | 1010134735 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |
| 54. | 526442 .08 | 14.5 | 200 | 2900 | A | 1010134619 | B | 1010134735 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |
| 55. | 526443 .08 | 14.5 | 200 | 2900 | A | 1010134740 | B | 1010134731 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | 1.24x10$^{-2}$ | 08C1238 | |

| Geocomposite | Geonet Component |
|---|---|
| *Transmissivity Conditions: | **Transmissivity Conditions: |
| 0.25 gradient, 10,000 psf load, 24 hr seat | 0.1 gradient, 10,000 psf |
| layered per specifications (site soil) | 15 minute seating time |

**Geocomposite Quality Certification**

**Customer:** Allied Waste Industries
**PO#:** to be given Charlotte Motor Spdwy
**Destination:** Concord, NC
**doc #:** 10450

Agru America certifies the following results for the above project:

Agru America
500 Garrison Road
Georgetown, SC 29440
ph: 843-546-0600

Quality Control Manager

agru america
quality control dept.

Type: 8-275-8
textile

| | roll # | wid | len | area | SIDE | TEX. ROLL # | SIDE | TEX. ROLL # | COMP ASTM D7005 PLY-A | COMP ASTM D7005 PLY-B | COMP ASTM D4716 Trans* | NET ASTM D5199 lo | NET ASTM D5199 hi | NET ASTM D5199 ave | NET ASTM D4218 Car | NET ASTM D792 Den | NET ASTM D5035 Ten | NET ASTM D5261 M/U | NET ASTM D4716 Trans** | Geocomposite *Transmissivity Conditions: 0.25 gradient, 10,000 psf load, 24 hr sea layered per specifications (site soil) Resin Lot # | Geonet Component **Transmissivity Conditions: 0.1 gradient, 10,000 psf 15 minute seating time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ft | ft | sqft | | | | | lb/in | lb/in | m²/sec | mil | mil | mil | % | g/cc | lb/in | lb/ft² | m²/sec | | |
| 56. | 526444 .08 | 14.5 | 200 | 2900 | A | 1010134740 | B | 1010134731 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 57. | 526445 .08 | 14.5 | 200 | 2900 | A | 1010134740 | B | 1010134731 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 58. | 526446 .08 | 14.5 | 200 | 2900 | A | 1010134740 | B | 1010134731 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 59. | 526447 .08 | 14.5 | 200 | 2900 | A | 1010134730 | B | 1010134729 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 60. | 526448 .08 | 14.5 | 200 | 2900 | A | 1010134730 | B | 1010134729 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 61. | 526449 .08 | 14.5 | 200 | 2900 | A | 1010134730 | B | 1010134729 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 62. | 526450 .08 | 14.5 | 200 | 2900 | A | 1010134743 | B | 1010134641 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 63. | 526451 .08 | 14.5 | 200 | 2900 | A | 1010134743 | B | 1010134641 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 64. | 526452 .08 | 14.5 | 200 | 2900 | A | 1010134743 | B | 1010134641 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 65. | 526453 .08 | 14.5 | 200 | 2900 | A | 1010134743 | B | 1010134641 | 4.01 | 4.98 | 2.72 x 10-4 | 278 | 294 | 286 | 2.04 | 0.954 | 105.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 66. | 526457 .08 | 14.5 | 200 | 2900 | A | 1010134613 | B | 1010134744 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | conf |
| 67. | 526458 .08 | 14.5 | 200 | 2900 | A | 1010134613 | B | 1010134744 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 68. | 526459 .08 | 14.5 | 200 | 2900 | A | 1010134613 | B | 1010134744 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 69. | 526460 .08 | 14.5 | 200 | 2900 | A | 1010134737 | B | 1010134739 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 70. | 526461 .08 | 14.5 | 200 | 2900 | A | 1010134737 | B | 1010134739 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 71. | 526462 .08 | 14.5 | 200 | 2900 | A | 1010134737 | B | 1010134739 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 72. | 526463 .08 | 14.5 | 200 | 2900 | A | 1010134737 | B | 1010134739 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 73. | 526464 .08 | 14.5 | 200 | 2900 | A | 1010134734 | B | 1010134599 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 74. | 526465 .08 | 14.5 | 200 | 2900 | A | 1010134734 | B | 1010134599 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 75. | 526466 .08 | 14.5 | 200 | 2900 | A | 1010134734 | B | 1010134599 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 76. | 526467 .08 | 14.5 | 200 | 2900 | A | 1010134733 | B | 1010134599 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 77. | 526468 .08 | 14.5 | 200 | 2900 | A | 1010134733 | B | 1010134646 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 78. | 526469 .08 | 14.5 | 200 | 2900 | A | 1010134733 | B | 1010134646 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 79. | 526470 .08 | 14.5 | 200 | 2900 | A | 1010134733 | B | 1010134646 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 80. | 526471 .08 | 14.5 | 200 | 2900 | A | 1010134639 | B | 1010134646 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 81. | 526472 .08 | 14.5 | 200 | 2900 | A | 1010134639 | B | 1010134634 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 82. | 526473 .08 | 14.5 | 200 | 2900 | A | 1010134639 | B | 1010134634 | 3.47 | 4.69 | 2.61 x 10-4 | 271 | 296 | 281 | 2.56 | 0.953 | 97.9 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 83. | 526477 .08 | 14.5 | 200 | 2900 | A | 1010134648 | B | 1010134634 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 84. | 526478 .08 | 14.5 | 200 | 2900 | A | 1010134648 | B | 1010134645 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 85. | 526479 .08 | 14.5 | 200 | 2900 | A | 1010134648 | B | 1010134645 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 86. | 526480 .08 | 14.5 | 200 | 2900 | A | 1010134648 | B | 1010134645 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 87. | 526481 .08 | 14.5 | 200 | 2900 | A | 1010134662 | B | 1010134645 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 88. | 526482 .08 | 14.5 | 200 | 2900 | A | 1010134662 | B | 1010134736 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 89. | 526483 .08 | 14.5 | 200 | 2900 | A | 1010134662 | B | 1010134736 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 90. | 526484 .08 | 14.5 | 200 | 2900 | A | 1010134718 | B | 1010134736 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 91. | 526485 .08 | 14.5 | 200 | 2900 | A | 1010134718 | B | 1010134647 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 92. | 526486 .08 | 14.5 | 200 | 2900 | A | 1010134718 | B | 1010134647 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 93. | 526487 .08 | 14.5 | 200 | 2900 | A | 1010134718 | B | 1010134647 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 94. | 526488 .08 | 14.5 | 200 | 2900 | A | 1010134632 | B | 1010134647 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 95. | 526489 .08 | 14.5 | 200 | 2900 | A | 1010134632 | B | 1010134654 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 96. | 526490 .08 | 14.5 | 200 | 2900 | A | 1010134632 | B | 1010134654 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 97. | 526491 .08 | 14.5 | 200 | 2900 | A | 1010134631 | B | 1010134654 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 98. | 526492 .08 | 14.5 | 200 | 2900 | A | 1010134631 | B | 1010134638 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 99. | 526493 .08 | 14.5 | 200 | 2900 | A | 1010134631 | B | 1010134638 | 3.20 | 5.77 | 2.61 x 10-4 | 271 | 291 | 283 | 2.52 | 0.953 | 103.9 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 100. | 526497 .08 | 14.5 | 200 | 2900 | A | 1010134631 | B | 1010134638 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 101. | 526498 .08 | 14.5 | 200 | 2900 | A | 1010134633 | B | 1010134638 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 102. | 526499 .08 | 14.5 | 200 | 2900 | A | 1010134633 | B | 1010134719 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 103. | 526400 .08 | 14.5 | 200 | 2900 | A | 1010134633 | B | 1010134719 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 104. | 526401 .08 | 14.5 | 200 | 2900 | A | 1010134622 | B | 1010134719 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 105. | 526502 .08 | 14.5 | 200 | 2900 | A | 1010134622 | B | 1010134640 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 106. | 526503 .08 | 14.5 | 200 | 2900 | A | 1010134622 | B | 1010134640 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 107. | 526504 .08 | 14.5 | 200 | 2900 | A | 1010134622 | B | 1010134640 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 108. | 526505 .08 | 14.5 | 200 | 2900 | A | 1010134716 | B | 1010134640 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | [illegible] | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 109 | 506 .08 | 14.5 | 200 | 2900 | A | 1010134716 | B | 1010134637 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 110 | 507 .08 | 14.5 | 200 | 2900 | A | 1010134716 | B | 1010134637 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |

**eocomposite Quality Certification**

**Customer:** Allied Waste Industries
**PO#:** to be given Charlotte Motor Spdwy
**Destination:** Concord, NC
**doc #:** 10450

Agru America certifies the following results for the above project:

Agru America
500 Garrison Road
Georgetown, SC 29440
ph: 843-546-0600

Quality Control Manager

agru america
quality control dept.

Type: 8-275-8 textile

| | roll # | wid | len | area | SIDE | TEX. ROLL # | SIDE | TEX. ROLL # | COMP ASTM D7005 PLY-A | COMP ASTM D7005 PLY-B | COMP ASTM D4716 Trans* | NET ASTM D5199 lo | NET ASTM D5199 hi | NET ASTM D5199 ave | NET ASTM D4218 Car | NET ASTM D792 Den | NET ASTM D5035 Ten | NET ASTM D5261 M/U | NET ASTM D4716 Trans** | Geocomposite *Transmissivity Conditions: 0.25 gradient, 10,000 psf load, 24 hr seat layered per specifications (site soil) | Geonet Component **Transmissivity Conditions: 0.1 gradient, 10,000 psf 15 minute seating time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ft | ft | sqft | | | | | lb/in | lb/in | m²/sec | mil | mil | mil | % | g/cc | lb/in | lb/ft² | m²/sec | Resin Lot # | |
| 111. | 526508 .08 | 14.5 | 200 | 2900 | A | 1010134716 | B | 1010134637 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 112. | 526509 .08 | 14.5 | 200 | 2900 | A | 1010134651 | B | 1010134649 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 113. | 526510 .08 | 14.5 | 200 | 2900 | A | 1010134651 | B | 1010134649 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 114. | 526511 .08 | 14.5 | 200 | 2900 | A | 1010134651 | B | 1010134649 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 115. | 526512 .08 | 14.5 | 200 | 2900 | A | 1010134651 | B | 1010134649 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 116. | 526516 .08 | 14.5 | 200 | 2900 | A | 1010134628 | B | 1010134635 | 4.20 | 3.80 | 2.61 x 10-4 | 271 | 296 | 285 | 2.41 | 0.955 | 99.0 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 117. | 526517 .08 | 14.5 | 200 | 2900 | A | 1010134628 | B | 1010134635 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 118. | 526518 .08 | 14.5 | 200 | 2900 | A | 1010134628 | B | 1010134635 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 119. | 526519 .08 | 14.5 | 200 | 2900 | A | 1010134655 | B | 1010134621 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 120. | 526520 .08 | 14.5 | 200 | 2900 | A | 1010134655 | B | 1010134621 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 121. | 526521 .08 | 14.5 | 200 | 2900 | A | 1010134655 | B | 1010134621 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 122. | 526522 .08 | 14.5 | 200 | 2900 | A | 1010134655 | B | 1010134621 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 123. | 526523 .08 | 14.5 | 200 | 2900 | A | 1010134630 | B | 1010134636 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 124. | 526524 .08 | 14.5 | 200 | 2900 | A | 1010134630 | B | 1010134636 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 125. | 526525 .08 | 14.5 | 200 | 2900 | A | 1010134630 | B | 1010134636 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 126. | 526526 .08 | 14.5 | 200 | 2900 | A | 1010134630 | B | 1010134746 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 127. | 526527 .08 | 14.5 | 200 | 2900 | A | 1010134703 | B | 1010134746 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 128. | 526528 .08 | 14.5 | 200 | 2900 | A | 1010134703 | B | 1010134746 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 129. | 526529 .08 | 14.5 | 200 | 2900 | A | 1010134703 | B | 1010134746 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 130. | 526530 .08 | 14.5 | 200 | 2900 | A | 1010134726 | B | 1010134725 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 131. | 526531 .08 | 14.5 | 200 | 2900 | A | 1010134726 | B | 1010134725 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 132. | 526532 .08 | 14.5 | 200 | 2900 | A | 1010134726 | B | 1010134725 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 133. | 526533 .08 | 14.5 | 200 | 2900 | A | 1010134726 | B | 1010134688 | 4.62 | 5.42 | 2.61 x 10-4 | 271 | 288 | 279 | 2.29 | 0.954 | 102.8 | 0.25 | $1.24x10^{-2}$ | 08C1238 | |
| 134. | 526537 .08 | 14.5 | 200 | 2900 | A | 1010134720 | B | 1010134688 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | conf |
| 135. | 526538 .08 | 14.5 | 200 | 2900 | A | 1010134720 | B | 1010134688 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 136. | 526539 .08 | 14.5 | 200 | 2900 | A | 1010134720 | B | 1010134688 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 137. | 526540 .08 | 14.5 | 200 | 2900 | A | 1010134723 | B | 1010134727 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 138. | 526541 .08 | 14.5 | 200 | 2900 | A | 1010134723 | B | 1010134727 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 139. | 526542 .08 | 14.5 | 200 | 2900 | A | 1010134723 | B | 1010134727 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 140. | 526543 .08 | 14.5 | 200 | 2900 | A | 1010134723 | B | 1010134727 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 141. | 526544 .08 | 14.5 | 200 | 2900 | A | 1010134689 | B | 1010134722 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 142. | 526545 .08 | 14.5 | 200 | 2900 | A | 1010134689 | B | 1010134722 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 143. | 526546 .08 | 14.5 | 200 | 2900 | A | 1010134689 | B | 1010134722 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 144. | 526547 .08 | 14.5 | 200 | 2900 | A | 1010134701 | B | 1010134710 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 145. | 526548 .08 | 14.5 | 200 | 2900 | A | 1010134701 | B | 1010134710 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 146. | 526549 .08 | 14.5 | 200 | 2900 | A | 1010134701 | B | 1010134710 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 147. | 526550 .08 | 14.5 | 200 | 2900 | A | 1010134701 | B | 1010134710 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 148. | 526551 .08 | 14.5 | 200 | 2900 | A | 1010134707 | B | 1010134708 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 149. | 526552 .08 | 14.5 | 200 | 2900 | A | 1010134707 | B | 1010134708 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 150. | 526553 .08 | 14.5 | 200 | 2900 | A | 1010134707 | B | 1010134708 | 5.74 | 5.43 | 2.33 x 10-4 | 279 | 303 | 294 | 2.34 | 0.952 | 104.1 | 0.27 | $1.24x10^{-2}$ | 08C1238 | |
| 151. | 526554 .08 | 14.5 | 200 | 2900 | A | 1010134709 | B | 1010134711 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 152. | 526555 .08 | 14.5 | 200 | 2900 | A | 1010134709 | B | 1010134711 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 153. | 526556 .08 | 14.5 | 200 | 2900 | A | 1010134709 | B | 1010134711 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 154. | 526560 .08 | 14.5 | 200 | 2900 | A | 1010134709 | B | 1010134711 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 155. | 526561 .08 | 14.5 | 200 | 2900 | A | 1010134624 | B | 1010134712 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 156. | 526662 .08 | 14.5 | 200 | 2900 | A | 1010134624 | B | 1010134712 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 157. | 526663 .08 | 14.5 | 200 | 2900 | A | 1010134624 | B | 1010134712 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 158. | 526664 .08 | 14.5 | 200 | 2900 | A | 1010134714 | B | 1010134713 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 159. | 526665 .08 | 14.5 | 200 | 2900 | A | 1010134714 | B | 1010134713 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 160. | 526666 .08 | 14.5 | 200 | 2900 | A | 1010134714 | B | 1010134713 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 161. | 526667 .08 | 14.5 | 200 | 2900 | A | 1010134714 | B | 1010134713 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 162. | 526668 .08 | 14.5 | 200 | 2900 | A | 1010134627 | B | 1010134625 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 163. | 526669 .08 | 14.5 | 200 | 2900 | A | 1010134627 | B | 1010134625 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 164. | 526670 .08 | 14.5 | 200 | 2900 | A | 1010134627 | B | 1010134625 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 165. | 526671 .08 | 14.5 | 200 | 2900 | A | 1010134705 | B | 1010134715 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |

**Geocomposite Quality Certification**

**Customer:** Allied Waste Industries
**PO#:** to be given Charlotte Motor Spdwy
**Destination:** Concord, NC
**doc #:** 10450

Agru America certifies the following results for the above project:

Agru America
500 Garrison Road
Georgetown, SC 29440
ph: 843-546-0600

Quality Control Manager

agru america
quality control dept.

Type: 8-275-8
textile

| | roll # | wid | len | area | SIDE | TEX. ROLL # | SIDE | TEX. ROLL # | COMP ASTM D7005 PLY-A | COMP ASTM D7005 PLY-B | COMP ASTM D4716 Trans* | NET ASTM D5199 lo | NET ASTM D5199 hi | NET ASTM D5199 ave | NET ASTM D4218 Car | NET ASTM D792 Den | NET ASTM D5035 Ten | NET ASTM D5261 M/U | NET ASTM D4716 Trans** | Geocomposite *Transmissivity Conditions: 0.25 gradient, 10,000 psf load, 24 hr seat layered per specifications (site soil) | Geonet Component **Transmissivity Conditions: 0.1 gradient, 10,000 psf 15 minute seating time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ft | ft | sqft | | | | | lb/in | lb/in | m²/sec | mil | mil | mil | % | g/cc | lb/in | lb/ft² | m²/sec | Resin Lot # | |
| 166. | 526672 .08 | 14.5 | 200 | 2900 | A | 1010134705 | B | 1010134715 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 167. | 526673 .08 | 14.5 | 200 | 2900 | A | 1010134705 | B | 1010134715 | 5.15 | 6.16 | 2.33 x 10-4 | 286 | 306 | 296 | 2.27 | 0.949 | 112.8 | 0.28 | $1.24x10^{-2}$ | 08C1238 | |
| 168. | 526674 .08 | 14.5 | 200 | 2900 | A | 1010134705 | B | 1010134715 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 169. | 526675 .08 | 14.5 | 200 | 2900 | A | 1010134717 | B | 1010134724 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 170. | 526679 .08 | 14.5 | 200 | 2900 | A | 1010134717 | B | 1010134724 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 171. | 526680 .08 | 14.5 | 200 | 2900 | A | 1010134717 | B | 1010134724 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 172. | 526681 .08 | 14.5 | 200 | 2900 | A | 1010134671 | B | 1010134626 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 173. | 526682 .08 | 14.5 | 200 | 2900 | A | 1010134671 | B | 1010134626 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 174. | 526683 .08 | 14.5 | 200 | 2900 | A | 1010134671 | B | 1010134626 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 175. | 526684 .08 | 14.5 | 200 | 2900 | A | 1010134671 | B | 1010134626 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 176. | 526685 .08 | 14.5 | 200 | 2900 | A | 1010134677 | B | 1010134669 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 177. | 526686 .08 | 14.5 | 200 | 2900 | A | 1010134677 | B | 1010134669 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 178. | 526687 .08 | 14.5 | 200 | 2900 | A | 1010134677 | B | 1010134669 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 179. | 526688 .08 | 14.5 | 200 | 2900 | A | 1010134675 | B | 1010134680 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 180. | 526689 .08 | 14.5 | 200 | 2900 | A | 1010134675 | B | 1010134680 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 181. | 526690 .08 | 14.5 | 200 | 2900 | A | 1010134675 | B | 1010134680 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 182. | 526691 .08 | 14.5 | 200 | 2900 | A | 1010134675 | B | 1010134680 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 183. | 526692 .08 | 14.5 | 200 | 2900 | A | 1010134697 | B | 1010134702 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 184. | 526693 .08 | 14.5 | 200 | 2900 | A | 1010134697 | B | 1010134702 | 4.62 | 5.33 | 2.33 x 10-4 | 288 | 310 | 298 | 2.53 | 0.952 | 101.5 | 0.29 | $1.29x10^{-2}$ | 08C1238 | |
| 185. | 526694 .08 | 14.5 | 200 | 2900 | A | 1010134697 | B | 1010134702 | 6.29 | 3.78 | 2.33 x 10-4 | 292 | 304 | 298 | 2.20 | 0.956 | 110.6 | 0.27 | $1.29x10^{-2}$ | 08C1238 | |
| 186. | 526695 .08 | 14.5 | 200 | 2900 | A | 1010134698 | B | 1010134699 | 6.29 | 3.78 | 2.33 x 10-4 | 292 | 304 | 298 | 2.20 | 0.956 | 110.6 | 0.27 | $1.29x10^{-2}$ | 08C1238 | |
| 187. | 526696 .08 | 14.5 | 200 | 2900 | A | 1010134698 | B | 1010134699 | 6.29 | 3.78 | 2.33 x 10-4 | 292 | 304 | 298 | 2.20 | 0.956 | 110.6 | 0.27 | $1.29x10^{-2}$ | 08C1238 | |
| 188. | 526697 .08 | 14.5 | 200 | 2900 | A | 1010134698 | B | 1010134699 | 6.29 | 3.78 | 2.33 x 10-4 | 292 | 304 | 298 | 2.20 | 0.956 | 110.6 | 0.27 | $1.29x10^{-2}$ | 08C1238 | |

DALCO
NONWOVENS, LLC

July 1, 2008

Agru/America, Inc.
500 Garrison Road
Georgetown, SC 29440

Re: DalTex 1080NH
Purchase Order Number: 004806
Doc #: 10450 Charlotte Motor Speedway
Roll Numbers: 1010134596-1010134746

Dear Sir/Madam:

This is to certify that DalTex 1080NH is a high quality needle-punched nonwoven geotextile manufactured by DALCO Nonwovens, LLC of 100% polypropylene staple fibers. Stable within a pH range of 2 to 13, the fibers are randomly networked to form a high strength dimensionally stable fabric. This fabric resists ultraviolet deterioration, rotting and biological degradation and it is inert to commonly encountered soil chemicals. It meets or exceeds the following physical properties:

| Fabric Property | Test Method | Units | Minimum Average Roll Value |
|---|---|---|---|
| **Grab Tensile** | ASTM D 4632 | lbs. | 205 (.91 kN) |
| **Grab Elongation** | ASTM D 4632 | % | 50 |
| **Trap Tear** | ASTM D 4533 | lbs. | 85 (.38 kN) |
| **Puncture** | ASTM D 4833 | lbs. | 130 (.58 kN) |
| **Mullen Burst** | ASTM D 3786 | psi | 400 (2756 kPa) |
| **Permittivity** | ASTM D 4491 | $sec^{-2}$ | 1.4 |
| **Water Flow Rate** | ASTM D 4491 | $gpm/ft^2$ | 90 (3675 $l/min/m^2$) |
| **AOS** | ASTM D 4751 | US Sieve | 80 (.180 mm) |
| **UV Resistance after 500 hrs.** | ASTM D 4355 | % Strength Retained | 70 |

Sincerely,

Andrea D. Brawley

Andrea Brawley
Quality Assurance Manager

# DALCO NONWOVENS, LLC ROLL DATA

**PURCHASE ORDER NUMBER: 4806**

**DOC#10450 - CHARLOTTE MOTOR SPEEDWAY**

**PRODUCT / STYLE NAME: DALTEX 1080NH**

| ROLL NUMBER | AVERAGE WEIGHT MD | AVERAGE GRAB TENSILE MD | AVERAGE ELONGATION MD | AVERAGE GRAB TENSILE XMD | AVERAGE ELONGATION XMD | AVERAGE TRAP TEAR MD | AVERAGE TRAP TEAR XMD | AVERAGE PUNCTURE RESISTANCE | AVERAGE MULLEN BURST | PERMITTIVITY | WATER FLOW RATE | APPARENT OPENING SIZE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1010134596 | 7.8 | 205 | 59 | 221 | 64 | 93 | 121 | 130 | 400 | 1.4 | 119 | 80 |
| 1010134609 | 8.3 | 225 | 58 | 240 | 60 | 97 | 119 | 131 | 405 | 1.4 | 120 | 80 |
| 1010134619 | 8.4 | 230 | 60 | 232 | 67 | 90 | 124 | 135 | 400 | 1.4 | 119 | 80 |
| 1010134630 | 8.4 | 231 | 61 | 235 | 66 | 101 | 130 | 133 | 405 | 1.4 | 119 | 80 |
| 1010134639 | 8.6 | 237 | 63 | 249 | 71 | 87 | 113 | 132 | 410 | 1.4 | 119 | 80 |
| 1010134650 | 7.7 | 207 | 55 | 236 | 53 | 90 | 107 | 131 | 415 | 1.4 | 118 | 80 |
| 1010134671 | 8.0 | 212 | 66 | 239 | 54 | 105 | 121 | 137 | 408 | 1.4 | 120 | 80 |
| 1010134702 | 8.1 | 219 | 71 | 240 | 61 | 109 | 126 | 139 | 408 | 1.4 | 119 | 80 |
| 1010134715 | 8.0 | 221 | 75 | 240 | 66 | 105 | 119 | 135 | 410 | 1.4 | 119 | 80 |
| 1010134726 | 7.8 | 205 | 57 | 235 | 60 | 89 | 115 | 130 | 405 | 1.4 | 120 | 80 |
| 1010134738 | 7.9 | 207 | 59 | 237 | 61 | 91 | 117 | 132 | 405 | 1.4 | 120 | 80 |
| **11** | **8.1** | **218** | **62** | **237** | **62** | **96.1** | **119.3** | **133** | **406** | **1.4** | **119** | **80** |

**Andrea S.**
**Quality Manager**

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS

1 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:( 888 )FPCUSA3

# QUALITY REPORT

CUSTOMER:PURE POLYMERS LLC
500 GARRISON ROAD

GEORGETOWN SC 29440
PRODUCT :HB101
RAILCAR TILX620450
ASTM CLASSIFICATION:GP4-16340

S/O NO : EI3A729
CUSTOMER PO : 4318
DATE SHIPPED: 3/31/08
LOT NO : 08C1236
WEIGHT : 192,700.00
CUSTID:FT03269 SPIDHC

| TEST ITEM | REFERENCE METHOD | TEST VALUE |
|---|---|---|
| Melt Index,g/10min | ASTM D1238 | .32 |
| Melt Index,g/10min | ASTM D1238 | .32 |
| Density, g/cm3 | ASTM D1505 | .9540 |

QC SUPERVISOR: JESSE CHANG

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS

201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978

PHONE:( 888 )FPCUSA3

# QUALITY REPORT

CUSTOMER:PURE POLYMERS LLC
500 GARRISON ROAD

GEORGETOWN SC 29440
PRODUCT :HB101
RAILCAR FPAX201554
ASTM CLASSIFICATION:GP4-16340

S/O NO : EI3A730
CUSTOMER PO : 4319
DATE SHIPPED: 3/31/08
LOT NO : 08C1238
WEIGHT : 192,450.00
CUSTID:FT03269 SPIDHC

| TEST ITEM | REFERENCE METHOD | TEST VALUE |
|---|---|---|
| Melt Index,g/10min | ASTM D1238 | .34 |
| Melt Index,g/10min | ASTM D1238 | .34 |
| Density, g/cm3 | ASTM D1505 | .9549 |

QC SUPERVISOR: JESSE CHANG

**SKAPS Industries**

**Engineered Synthetic Products, Inc.**

February 23, 2007
Agru America, Inc.
500 Garrison Road
Georgetown, SC 29440

**Ref. : Charlotte Motor Speedway, NC**
**Customer P.O. # 4513**
**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[3]** | | | | |
| Mass per Unit Area | ASTM D 5261 | $lbs/ft^2$ | 0.2 | Minimum |
| Thickness | ASTM D 5199 | mil | 250 | Minimum |
| Carbon Black | ASTM D 4218 | % | 2.0 | Minimum |
| Tensile Strength | ASTM D 5035 | lbs/in | 55 | Minimum |
| Melt Flow | ASTM D 1238[2] | g/10 min | 1.0 | Maximum |
| Density | ASTM D 1505 | $g/cm^3$ | 0.94 | Minimum |
| **Composite** | | | | |
| Ply Adhesion | GRI GC7 | lb/in | 0.5 | MARV[5] |
| Transmissivity[1] | ASTM D 4716 | $m^2/sec$ | $5.0 \times 10^{-4}$ | MARV |
| **Geotextile[3 & 4]** | | | | |
| Fabric Weight | ASTM D 5261 | $oz/yd^2$ | 8.0 | MARV |
| Grab Strength | ASTM D 4632 | lbs | 205 | MARV |
| Thickness | ASTM D 1777 | mils | 100 | MARV |
| Grab Elongation | ASTM D 4632 | % | 50 | MARV |
| Tear Strength | ASTM D 4533 | lbs | 80 | MARV |
| Puncture Resistance | ASTM D 4833 | lbs | 95 | MARV |
| Mullen Burst | ASTM D 3786 | psi | 425 | MARV |
| Water Flow Rate | ASTM D 4491 | $gpm/ft^2$ | 100 | MARV |
| Permittivity | ASTM D 4491 | $sec^{-1}$ | 1.05 | MARV |
| Permeability | ASTM D 4491 | cm/sec | 0.3 | MARV |
| AOS | ASTM D 4751 | US Sieve | 80 | MARV |

**Notes:**

1 Transmissivity measured using water at 21 $\pm$ 2 °C (70 $\pm$ 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & 60 mil HDPE geomembrane after 24 hours.

2 Condition 190/2.16

3 Geotextile and Geonet properties are prior to lamination.

4 Geotextile data is provided by the supplier.

5 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 :** **Charlotte Motor Speedway, NC**

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 | 2245001 | 2245001 - N | 2245.008 | 2245.002 | 1.30 | 1.86 | $6.31 \times 10^{-4}$ |
| 2 | 2245002 | 2245002 - N | 2245.008 | 2245.002 | | | |
| 3 | 2245003 | 2245003 - N | 2245.008 | 2245.002 | | | |
| 4 | 2245004 | 2245004 - N | 2245.008 | 2245.002 | | | |
| 5 | 2245005 | 2245005 - N | 2245.008 | 2245.002 | | | |
| 6 | 2245006 | 2245006 - N | 2245.008 | 2245.002 | | | |
| 7 | 2245007 | 2245007 - N | 2245.001 | 2245.009 | | | |
| 8 | 2245008 | 2245008 - N | 2245.001 | 2245.009 | | | |
| 9 | 2245009 | 2245009 - N | 2245.001 | 2245.009 | | | |
| 10 | 2245010 | 2245010 - N | 2245.001 | 2245.009 | | | |
| 11 | 2245011 | 2245011 - N | 2245.001 | 2245.009 | | | |
| 12 | 2245012 | 2245012 - N | 2245.001 | 2245.009 | | | |
| 13 | 2245013 | 2245013 - N | 2245.012 | 2245.004 | | | |
| 14 | 2245014 | 2245014 - N | 2245.012 | 2245.004 | | | |
| 15 | 2245015 | 2245015 - N | 2245.012 | 2245.004 | 1.21 | 1.69 | |
| 16 | 2245016 | 2245016 - N | 2245.012 | 2245.004 | | | |
| 17 | 2245017 | 2245017 - N | 2245.012 | 2245.004 | | | |
| 18 | 2245018 | 2245018 - N | 2245.012 | 2245.004 | | | |
| 19 | 2245019 | 2245019 - N | 2245.003 | 2245.011 | | | |
| 20 | 2245020 | 2245020 - N | 2245.003 | 2245.011 | | | |
| 21 | 2245021 | 2245021 - N | 2245.003 | 2245.011 | | | |
| 22 | 2245022 | 2245022 - N | 2245.003 | 2245.011 | | | |
| 23 | 2245023 | 2245023 - N | 2245.003 | 2245.011 | | | |
| 24 | 2245024 | 2245024 - N | 2245.003 | 2245.011 | | | |
| 25 | 2245025 | 2245025 - N | 2245.015 | 2245.006 | | | |
| 26 | 2245026 | 2245026 - N | 2245.015 | 2245.006 | | | |
| 27 | 2245027 | 2245027 - N | 2245.015 | 2245.006 | | | |

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & 60 mil HDPE geomembrane after 24 hour.

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 :** **Charlotte Motor Speedway, NC**

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 ($m^2/sec$) |
|---|---|---|---|---|---|---|---|
| 2245001 - N | UTCX54823 | 0.9557 | 0.288 | 273 | 2.53 | 96 | |
| 2245002 - N | UTCX54823 | 0.9557 | | | | | |
| 2245003 - N | UTCX54823 | 0.9557 | | | | | |
| 2245004 - N | UTCX54823 | 0.9557 | | | | | |
| 2245005 - N | UTCX54823 | 0.9557 | | | | | |
| 2245006 - N | UTCX54823 | 0.9557 | | | | | |
| 2245007 - N | UTCX54823 | 0.9557 | | | | | |
| 2245008 - N | UTCX54823 | 0.9557 | | | | | |
| 2245009 - N | UTCX54823 | 0.9557 | | | | | |
| 2245010 - N | UTCX54823 | 0.9557 | | | | | |
| 2245011 - N | UTCX54823 | 0.9557 | | | | | |
| 2245012 - N | UTCX54823 | 0.9557 | | | | | |
| 2245013 - N | UTCX54823 | 0.9557 | | | | | |
| 2245014 - N | UTCX54823 | 0.9557 | | | | | |
| 2245015 - N | UTCX54823 | 0.9557 | 0.279 | 270 | 2.42 | 94 | |
| 2245016 - N | UTCX54823 | 0.9557 | | | | | |
| 2245017 - N | UTCX54823 | 0.9557 | | | | | |
| 2245018 - N | UTCX54823 | 0.9557 | | | | | |
| 2245019 - N | UTCX54823 | 0.9557 | | | | | |
| 2245020 - N | UTCX54823 | 0.9557 | | | | | |
| 2245021 - N | UTCX54823 | 0.9557 | | | | | |
| 2245022 - N | UTCX54823 | 0.9557 | | | | | |
| 2245023 - N | UTCX54823 | 0.9557 | | | | | |
| 2245024 - N | UTCX54823 | 0.9557 | | | | | |
| 2245025 - N | UTCX54823 | 0.9557 | | | | | |
| 2245026 - N | UTCX54823 | 0.9557 | | | | | |
| 2245027 - N | UTCX54823 | 0.9557 | | | | | |

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 :** **Charlotte Motor Speedway, NC**

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 | 2245028 | 2245028 - N | 2245.015 | 2245.006 | | | |
| 2 | 2245029 | 2245029 - N | 2245.015 | 2245.006 | | | |
| 3 | 2245030 | 2245030 - N | 2245.015 | 2245.006 | 1.32 | 1.91 | |
| 4 | 2245031 | 2245031 - N | 2245.007 | 2245.021 | | | |
| 5 | 2245032 | 2245032 - N | 2245.007 | 2245.021 | | | |
| 6 | 2245033 | 2245033 - N | 2245.007 | 2245.021 | | | |
| 7 | 2245034 | 2245034 - N | 2245.007 | 2245.021 | | | |
| 8 | 2245035 | 2245035 - N | 2245.007 | 2245.021 | | | |
| 9 | 2245036 | 2245036 - N | 2245.007 | 2245.021 | | | |
| 10 | 2245037 | 2245037 - N | 2245.013 | 2245.014 | | | |
| 11 | 2245038 | 2245038 - N | 2245.013 | 2245.014 | | | |
| 12 | 2245039 | 2245039 - N | 2245.013 | 2245.014 | | | |
| 13 | 2245040 | 2245040 - N | 2245.013 | 2245.014 | | | |
| 14 | 2245041 | 2245041 - N | 2245.013 | 2245.014 | | | |
| 15 | 2245042 | 2245042 - N | 2245.013 | 2245.014 | | | |
| 16 | 2245043 | 2245043 - N | 2245.005 | 2245.023 | | | |
| 17 | 2245044 | 2245044 - N | 2245.005 | 2245.023 | | | |
| 18 | 2245045 | 2245045 - N | 2245.005 | 2245.023 | 1.25 | 1.52 | |
| 19 | 2245046 | 2245046 - N | 2245.005 | 2245.023 | | | |
| 20 | 2245047 | 2245047 - N | 2245.005 | 2245.023 | | | |
| 21 | 2245048 | 2245048 - N | 2245.005 | 2245.023 | | | |
| 22 | 2245049 | 2245049 - N | 2245.017 | 2245.016 | | | |
| 23 | 2245050 | 2245050 - N | 2245.017 | 2245.016 | | | |
| 24 | 2245051 | 2245051 - N | 2245.017 | 2245.016 | | | |
| 25 | 2245052 | 2245052 - N | 2245.017 | 2245.016 | | | |
| 26 | 2245053 | 2245053 - N | 2245.017 | 2245.016 | | | |
| 27 | 2245054 | 2245054 - N | 2245.017 | 2245.016 | | | |

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & 60 mil HDPE geomembrane after 24 hour.

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 :** **Charlotte Motor Speedway, NC**

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 ($m^2/sec$) |
|---|---|---|---|---|---|---|---|
| 2245028 - N | UTCX54823 | 0.9557 | | | | | |
| 2245029 - N | UTCX54823 | 0.9557 | | | | | |
| 2245030 - N | UTCX54823 | 0.9557 | 0.292 | 277 | 2.67 | 98 | |
| 2245031 - N | UTCX54823 | 0.9557 | | | | | |
| 2245032 - N | UTCX54823 | 0.9557 | | | | | |
| 2245033 - N | UTCX54823 | 0.9557 | | | | | |
| 2245034 - N | UTCX54823 | 0.9557 | | | | | |
| 2245035 - N | UTCX54823 | 0.9548 | | | | | |
| 2245036 - N | UTCX54823 | 0.9548 | | | | | |
| 2245037 - N | UTCX54823 | 0.9548 | | | | | |
| 2245038 - N | UTCX54823 | 0.9548 | | | | | |
| 2245039 - N | UTCX54823 | 0.9548 | | | | | |
| 2245040 - N | UTCX54823 | 0.9548 | | | | | |
| 2245041 - N | UTCX54823 | 0.9548 | | | | | |
| 2245042 - N | UTCX54823 | 0.9548 | | | | | |
| 2245043 - N | UTCX54823 | 0.9548 | | | | | |
| 2245044 - N | UTCX54823 | 0.9548 | | | | | |
| 2245045 - N | UTCX54823 | 0.9548 | 0.283 | 272 | 2.31 | 92 | |
| 2245046 - N | UTCX54823 | 0.9548 | | | | | |
| 2245047 - N | UTCX54823 | 0.9548 | | | | | |
| 2245048 - N | UTCX54823 | 0.9548 | | | | | |
| 2245049 - N | UTCX54823 | 0.9548 | | | | | |
| 2245050 - N | UTCX54823 | 0.9548 | | | | | |
| 2245051 - N | UTCX54823 | 0.9548 | | | | | |
| 2245052 - N | UTCX54823 | 0.9548 | | | | | |
| 2245053 - N | UTCX54823 | 0.9548 | | | | | |
| 2245054 - N | UTCX54823 | 0.9548 | | | | | |

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 :** **Charlotte Motor Speedway, NC**

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 | 2245055 | 2245055 - N | 2245.010 | 2245.028 | | | |
| 2 | 2245056 | 2245056 - N | 2245.010 | 2245.028 | | | |
| 3 | 2245057 | 2245057 - N | 2245.010 | 2245.028 | | | |
| 4 | 2245058 | 2245058 - N | 2245.010 | 2245.028 | | | |
| 5 | 2245059 | 2245059 - N | 2245.010 | 2245.028 | | | |
| 6 | 2245060 | 2245060 - N | 2245.010 | 2245.028 | 1.28 | 1.82 | |
| 7 | 2245061 | 2245061 - N | 2245.025 | 2245.019 | | | |
| 8 | 2245062 | 2245062 - N | 2245.025 | 2245.019 | | | |
| 9 | 2245063 | 2245063 - N | 2245.025 | 2245.019 | | | |
| 10 | 2245064 | 2245064 - N | 2245.025 | 2245.019 | | | |
| 11 | 2245065 | 2245065 - N | 2245.025 | 2245.019 | | | |
| 12 | 2245066 | 2245066 - N | 2245.025 | 2245.019 | | | |
| 13 | 2245067 | 2245067 - N | 2245.018 | 2245.030 | | | |
| 14 | 2245068 | 2245068 - N | 2245.018 | 2245.030 | | | |
| 15 | 2245069 | 2245069 - N | 2245.018 | 2245.030 | | | |
| 16 | 2245070 | 2245070 - N | 2245.018 | 2245.030 | | | $6.11 \times 10^{-1}$ |
| 17 | 2245071 | 2245071 - N | 2245.018 | 2245.030 | | | |
| 18 | 2245072 | 2245072 - N | 2245.018 | 2245.030 | | | |
| 19 | 2245073 | 2245073 - N | 2245.027 | 2245.022 | | | |
| 20 | 2245074 | 2245074 - N | 2245.027 | 2245.022 | | | |
| 21 | 2245075 | 2245075 - N | 2245.027 | 2245.022 | 1.23 | 1.61 | |
| 22 | 2245076 | 2245076 - N | 2245.027 | 2245.022 | | | |
| 23 | 2245077 | 2245077 - N | 2245.027 | 2245.022 | | | |
| 24 | 2245078 | 2245078 - N | 2245.027 | 2245.022 | | | |
| 25 | 2245079 | 2245079 - N | 2245.020 | 2245.034 | | | |
| 26 | 2245080 | 2245080 - N | 2245.020 | 2245.034 | | | |
| 27 | 2245081 | 2245081 - N | 2245.020 | 2245.034 | | | |

* Transmissivity measured using water at 21 $\pm$ 2 °C (70 $\pm$ 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & 60 mil HDPE geomembrane after 24 hour.

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 :** **Charlotte Motor Speedway, NC**

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 ($m^2/sec$) |
|---|---|---|---|---|---|---|---|
| 2245055 - N | UTCX54823 | 0.9548 | | | | | |
| 2245056 - N | UTCX54823 | 0.9548 | | | | | |
| 2245057 - N | UTCX54823 | 0.9548 | | | | | |
| 2245058 - N | UTCX54823 | 0.9548 | | | | | |
| 2245059 - N | UTCX54823 | 0.9548 | | | | | |
| 2245060 - N | UTCX54823 | 0.9548 | 0.294 | 275 | 2.59 | 95 | |
| 2245061 - N | UTCX54823 | 0.9548 | | | | | |
| 2245062 - N | UTCX54823 | 0.9548 | | | | | |
| 2245063 - N | UTCX54823 | 0.9548 | | | | | |
| 2245064 - N | UTCX54823 | 0.9548 | | | | | |
| 2245065 - N | UTCX54823 | 0.9548 | | | | | |
| 2245066 - N | UTCX54823 | 0.9548 | | | | | |
| 2245067 - N | UTCX54823 | 0.9548 | | | | | |
| 2245068 - N | UTCX54823 | 0.9548 | | | | | |
| 2245069 - N | UTCX54823 | 0.9548 | | | | | |
| 2245070 - N | UTCX54823 | 0.9559 | | | | | |
| 2245071 - N | UTCX54823 | 0.9559 | | | | | |
| 2245072 - N | UTCX54823 | 0.9559 | | | | | |
| 2245073 - N | UTCX54823 | 0.9559 | | | | | |
| 2245074 - N | UTCX54823 | 0.9559 | | | | | |
| 2245075 - N | UTCX54823 | 0.9559 | 0.281 | 268 | 2.48 | 93 | |
| 2245076 - N | UTCX54823 | 0.9559 | | | | | |
| 2245077 - N | UTCX54823 | 0.9559 | | | | | |
| 2245078 - N | UTCX54823 | 0.9559 | | | | | |
| 2245079 - N | UTCX54823 | 0.9559 | | | | | |
| 2245080 - N | UTCX54823 | 0.9559 | | | | | |
| 2245081 - N | UTCX54823 | 0.9559 | | | | | |

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

of NORTH CAROLINA, PLLC

# SECTION E-4

## Geotextile

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

**July 14, 2008**
**Plastic Fusion**
3455 Stanwood Blvd
Huntsville, AL 35811
**PO : P11780**

Dear Sir/Madam:

This is to certify that SKAPS GT180 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 GT180 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 GT180 conforms to the property values listed below:

| PROPERTY | TEST METHOD | UNITS | M.A.R.V. Minimum Average Roll Value |
|---|---|---|---|
| Weight(Typical) | ASTM D 5261 | oz/sy (g/m$^2$) | 8.00 (271) |
| Grab Tensile | ASTM D 4632 | lbs (kN) | 205 (0.91) |
| Grab Elongation | ASTM D 4632 | % | 50 |
| Trapezoidal Tear | ASTM D 4533 | lbs (kN) | 85 (0.38) |
| Puncture Resistance | ASTM D 4833 | lbs (kN) | 130 (0.58) |
| Permittivity* | ASTM D 4491 | sec$^{-1}$ | 1.40 |
| Water Flow* | ASTM D 4491 | gpm/ft$^2$(l/min/m$^2$) | 90 (3667) |
| 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 : GT180-180**

| ROLL # | WEIGHT* | MD TENSILE | MD ELONG | XMD TENSILE | XMD ELONG | MD TRAP | XMD TRAP | PUNCTURE | AOS | WATER FLOW | PERMITTIVITY |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM METHOD | D5261 | D4632 | D4632 | D4632 | D4632 | D4533 | D4533 | D4833 | D4751 | D4491 | D4491 |
| UNITS | oz/sq yd | lbs. | % | lbs | % | lbs. | lbs | lbs. | US Sieve | $gpm/ft^2$ | $sec^{-1}$ |
| TARGET | 8.00 | 205 | 50 | 205 | 50 | 85 | 85 | 130 | 80 | 90 | 1.40 |
| 8822.01 | 8.34 | 211 | 73 | 238 | 79 | 91 | 104 | 137 | 80 | 113 | 1.51 |
| 8822.02 | 8.34 | 211 | 73 | 238 | 79 | 91 | 104 | 137 | 80 | 113 | 1.51 |
| 8822.03 | 8.34 | 211 | 73 | 238 | 79 | 91 | 104 | 137 | 80 | 113 | 1.51 |
| 8822.04 | 8.34 | 211 | 73 | 238 | 79 | 91 | 104 | 137 | 80 | 113 | 1.51 |
| 8822.05 | 8.22 | 209 | 71 | 235 | 76 | 91 | 104 | 137 | 80 | 113 | 1.51 |
| 8822.06 | 8.22 | 209 | 71 | 235 | 76 | 91 | 104 | 137 | 80 | 113 | 1.51 |
| 8822.07 | 8.22 | 209 | 71 | 235 | 76 | 91 | 104 | 137 | 80 | 113 | 1.51 |

*Weight is typical. All other values are MARV.

of NORTH CAROLINA, PLLC

# APPENDIX F

## Certificates of Acceptance of Soil Surface

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ENVIRONMENTAL SPECIALTIES INT'L, INC

do hereby accept the area of soil surface bound by

PANELS P-1 TO P-10

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| VICTOR BUITRON | | Q-C | 6/10/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| LARRY FREEMAN | | CQA | 6/10/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | | EM | 6/10/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: EST

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ENVIRONMENTAL SPECIALTIES INTERNATIONAL, INC

do hereby accept the area of soil surface bound by

PANELS P-11 TO P-28

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| VICTOR BUITRON | | | 6/11/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| LARRY FREEMAN | | CQA | 6/11/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gunley | | EM | 6/11/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

GEOSYNTHETIC INSTALLER: ESI

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ENVIRONMENTAL SPECIALTIES INTERNATIONAL, INC

do hereby accept the area of soil surface bound by

PANELS P-29 TO P-34

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| VICTOR BUITRON | | | 6/12/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| LARRY FREEMAN | | CQA | 6/12/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gourley | | EM | 6/12/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ENVIRONMENTAL SPECIALTIES INTERNATIONAL, INC.

do hereby accept the area of soil surface bound by

PANELS P-35 TO P-61

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| VICTOR BUTTRON | | QC | 6/13/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| LARRY FREEMAN | | CQA | 6/13/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | | EM | 6/13/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ENVIRONMENTAL SPECIALTIES INTERNATIONAL, INC

do hereby accept the area of soil surface bound by

PANELS P-62 TO P76

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| VICTOR BUITRON | | QC | 6/14/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| LARRY FREEMAN | | CQA | 6/14/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | | EM | 6/14/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ENVIRONMENTAL SPECIALTIES INTERNATIONAL, INC.

do hereby accept the area of soil surface bound by

PANELS P-77 TO P-95

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| VICTOR BUTTRAM | | QC | 6/16/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| LARRY FREEMAN | | CQA | 6/16/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | | PM | 6/16/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY: [illegible]

I, the Undersigned, the duly authorized representative of Environmental Specialties International, INC

do hereby accept the area of soil surface bound by PANELS 96-110

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Victor Buitron | [signature] | Q.C. | 6/17/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Ben McFry | [signature] | CQA | 6/17/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | [signature] | EM | 6/17/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY: [illegible]

I, the Undersigned, the duly authorized representative of Environmental Specialties International, Inc

do hereby accept the area of soil surface bound by

Panels P-111 — P128

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Victor Buitron | [signature] | Q.C | 06/18/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Ben McFey | [signature] | CQA | 6/18/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | Mike Gurley | EM | 6/18/08 |

ATLANTIC COAST CONSULTING, INC

# CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of Environmental Specialties International INC.,

do hereby accept the area of soil surface bound by

Panels P-129 thru P-152

and shall be responsible for maintaining its integrity and suitablity in accordance with the project specifications from this date to the completion of the project.

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Victor Buttrom | | | 6/18/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Ben McFry | | CQA | 6/19/08 |

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

| NAME | SIGNATURE | TITLE | DATE |
|---|---|---|---|
| Mike Gurley | | EM | 6/19/08 |

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX G

## Panel Deployment Log

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6/10/08

DEPLOYMENT MONITOR(S): BM

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil Textured HDPE

SHEET NUMBER: 1 OF 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS | | | | | | | | | | | | | | | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | LEAD | | | | | LEFT SIDE | | | | | RIGHT SIDE | | | | | TRAIL | | | | | |
| | | | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | |
| 1 | P-1 | 221108 | 414 | yes | 61 | 60 | 61 | 61 | 62 | 62 | 62 | 63 | 63 | 62 | | | | | | | | | | | |
| 2 | P-2 | 221246 | 415 | yes | 61 | 61 | 62 | 62 | 61 | 62 | 62 | 63 | 62 | 63 | | | | | | | | | | | |
| 3 | P-3 | 220-731 | 42 | yes | 62 | 62 | 63 | 62 | 61 | 63 | 63 | 63 | 63 | 64 | | | | | | | | | | | |
| 4 | P-4 | 220731 | 42 | yes | 63 | 62 | 62 | 63 | 62 | 63 | 64 | 64 | 63 | 63 | | | | | | | | | | | |
| 5 | P-5 | 221-112 | 411 | yes | 62 | 62 | 63 | 63 | 63 | 64 | 63 | 64 | 64 | 63 | | | | | | | | | | | |
| 6 | P-6 | 220-731 | 48 | yes | 62 | 63 | 62 | 62 | 63 | 63 | 63 | 64 | 65 | 65 | | | | | | | | | | | |
| 7 | P7 | 221357 | 412 | yes | 63 | 63 | 62 | 63 | 63 | 64 | 64 | 65 | 65 | 64 | | | | | | | | | | | |
| 8 | P8 | 220-731 | 47 | yes | 63 | 62 | 63 | 62 | 62 | 63 | 63 | 64 | 63 | 63 | | | | | | | | | | | |
| 9 | P9 | 221361 | 411 | " | 62 | 61 | 61 | 60 | 61 | 62 | 62 | 62 | 63 | 62 | | | | | | | | | | | |
| 10 | P10 | 220731 | 48 | " | 61 | 61 | 61 | 61 | 62 | 63 | 64 | 63 | 64 | 64 | | | | | | | | | | | |
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| 24 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

2290' × 22.5' =
51,525 sq.ft.

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6-11-08

DEPLOYMENT MONITOR(S): BM

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil textured HDPE

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P-11 | 221-235 | 405 | yes | 62 | 63 | 62 | 62 | 63 | 63 | 63 | 62 | 63 | 62 | | | | | | | | | | | |
| 2 | P-12 | 221-221 | 396 | " | 63 | 63 | 63 | 62 | 63 | 62 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 3 | P-13 | 220-731 | 41 | " | 61 | 62 | 62 | 63 | 62 | 61 | 62 | 61 | 63 | 63 | | | | | | | | | | | |
| 4 | P-14 | " - " | 49 | " | 63 | 61 | 61 | 62 | 62 | 62 | 63 | 63 | 61 | 62 | | | | | | | | | | | |
| 5 | P-15 | 220 734 | 407 | " | 63 | 62 | 63 | 61 | 62 | 61 | 61 | 62 | 63 | 63 | | | | | | | | | | | |
| 6 | P-16 | 220-735 | 407 | " | 62 | 63 | 62 | 63 | 61 | 62 | 61 | 62 | 63 | 61 | | | | | | | | | | | |
| 7 | P-17 | 220 731 | 40 | " | 62 | 61 | 62 | 62 | 63 | 61 | 63 | 62 | 63 | 62 | | | | | | | | | | | |
| 8 | P-18 | 220 731 | 40 | " | 63 | 61 | 61 | 61 | 63 | 62 | 63 | 63 | 62 | 61 | | | | | | | | | | | |
| 9 | P-19 | 221-239 | 410 | " | 61 | 62 | 62 | 61 | 62 | 63 | 63 | 61 | 62 | 62 | | | | | | | | | | | |
| 10 | P-20 | 220-729 | 412 | " | 63 | 63 | 61 | 62 | 61 | 62 | 63 | 61 | 63 | 63 | | | | | | | | | | | |
| 11 | P-21 | 221-220 | 38 | " | 62 | 62 | 61 | 63 | 61 | 61 | 62 | 61 | 61 | 62 | | | | | | | | | | | |
| 12 | P-22 | 221-220 | 39 | " | 61 | 63 | 62 | 62 | 62 | 61 | 61 | 63 | 63 | 63 | | | | | | | | | | | |
| 13 | P-23 | 221-118 | 411 | " | 61 | 61 | 62 | 61 | 63 | 63 | 62 | 62 | 61 | 61 | | | | | | | | | | | |
| 14 | P-24 | 220-725 | 411 | " | 62 | 63 | 61 | 63 | 62 | 61 | 63 | 62 | 61 | 61 | | | | | | | | | | | |
| 15 | P-25 | 221-220 | 37 | " | 63 | 63 | 61 | 63 | 62 | 62 | 62 | 63 | 62 | 62 | | | | | | | | | | | |
| 16 | P-26 | 221-220 | 37 | " | 62 | 63 | 62 | 62 | 61 | 62 | 61 | 62 | 61 | 61 | | | | | | | | | | | |
| 17 | P-27 | 220-730 | 412 | " | 62 | 61 | 62 | 61 | 63 | 61 | 62 | 63 | 63 | 62 | | | | | | | | | | | |
| 18 | P28 | 221-220 | 36 | " | 61 | 62 | 61 | 62 | 63 | 63 | 63 | 62 | 63 | 62 | | | | | | | | | | | |
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| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

4028' x 22.5' =

90,630 sq.ft.

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6/12/08

DEPLOYMENT MONITOR(S): BM

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil texture HDPE

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 29 | 221226 | 418 | yes | 61 | 63 | 63 | 62 | 61 | 62 | 62 | 61 | 63 | 61 | | | | | | | | | | | |
| 2 | 30 | 221220 | 34 | yes | 62 | 62 | 63 | 62 | 63 | 61 | 62 | 62 | 63 | 62 | | | | | | | | | | | |
| 3 | 31 | 221222 | 419 | yes | 61 | 61 | 63 | 62 | 63 | 63 | 62 | 62 | 63 | 61 | | | | | | | | | | | |
| 4 | 32 | 221220 | 34 | yes | 63 | 62 | 63 | 61 | 61 | 62 | 63 | 62 | 63 | 61 | | | | | | | | | | | |
| 5 | 33 | 220733 | 417 | yes | 62 | 61 | 63 | 64 | 62 | 62 | 61 | 63 | 62 | 62 | | | | | | | | | | | |
| 6 | 34 | 221220 | 35 | yes | 61 | 62 | 63 | 62 | 63 | 63 | 61 | 62 | 61 | 61 | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

1357' x 22.5' = 30532 sq. ft.

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6/13/08

DEPLOYMENT MONITOR(S): Bm

REVIEWED BY: [illegible]

MATERIAL TYPE: 60mil textured HDPE

SHEET NUMBER: 1 of 2

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P-35 | 221106 | 408 | yes | 62 | 63 | 62 | 63 | 63 | 61 | 62 | 61 | 61 | 63 | | | | | | | | | | | |
| 2 | P-36 | 221220 | 37 | yes | 61 | 61 | 62 | 63 | 62 | 61 | 63 | 63 | 62 | 61 | | | | | | | | | | | |
| 3 | P-37 | 220728 | 409 | yes | 62 | 61 | 61 | 61 | 63 | 62 | 62 | 63 | 61 | 62 | | | | | | | | | | | |
| 4 | P-38 | 221220 | 37 | yes | 63 | 63 | 62 | 63 | 61 | 62 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 5 | P 39 | 220726 | 417 | yes | 62 | 63 | 62 | 61 | 62 | 63 | 62 | 63 | 63 | 62 | | | | | | | | | | | |
| 6 | P 40 | 221220 | 41 | yes | 61 | 61 | 62 | 63 | 63 | 61 | 62 | 61 | 63 | 63 | | | | | | | | | | | |
| 7 | P 41 | 221236 | 416 | yes | 63 | 62 | 63 | 62 | 62 | 61 | 61 | 62 | 62 | 63 | | | | | | | | | | | |
| 8 | P 42 | 220724 | 40 | yes | 63 | 62 | 61 | 62 | 63 | 62 | 63 | 63 | 62 | 61 | | | | | | | | | | | |
| 9 | P 43 | 220727 | 418 | yes | 62 | 63 | 61 | 61 | 62 | 61 | 63 | 62 | 61 | 61 | | | | | | | | | | | |
| 10 | P 44 | 220724 | 36 | yes | 61 | 62 | 62 | 63 | 62 | 63 | 61 | 63 | 63 | 62 | | | | | | | | | | | |
| * 11 | P 45 | 221103 | 269 | yes | 62 | 63 | 63 | 61 | 62 | 61 | 61 | 62 | 63 | 62 | | | | | | | | | | | 45 : 46 |
| 12 | P 46 | 221103 | | yes | 62 | 63 | 63 | 62 | 63 | 62 | 61 | 62 | 62 | 63 | | | | | | | | | | | cut from SAM |
| 13 | P 47 | 221103 | 149 | yes | 63 | 62 | 61 | 62 | 63 | 63 | 62 | 62 | 61 | 61 | | | | | | | | | | | PC. |
| 14 | P 48 | 221233 | 120 | yes | 61 | 62 | 63 | 63 | 63 | 62 | 62 | 63 | 62 | 62 | | | | | | | | | | | |
| 15 | P 49 | 221233 | 77 | yes | 63 | 61 | 63 | 64 | 63 | 63 | 62 | 61 | 62 | 62 | | | | | | | | | | | |
| 16 | P 50 | 221233 | 40 | yes | 62 | 62 | 61 | 61 | 62 | 63 | 62 | 62 | 61 | 63 | | | | | | | | | | | |
| 17 | P 51 | 221234 | 262 | yes | 63 | 61 | 61 | 62 | 63 | 64 | 63 | 62 | 62 | 61 | | | | | | | | | | | |
| 18 | P-52 | 221234 | 159 | yes | 62 | 63 | 61 | 63 | 63 | 62 | 63 | 61 | 62 | 63 | | | | | | | | | | | |
| 19 | P-53 | 221351 | 101 | yes | 62 | 61 | 62 | 63 | 61 | 61 | 61 | 63 | 63 | 62 | | | | | | | | | | | |
| 20 | P-54 | 221351 | 247 | yes | 63 | 62 | 61 | 63 | 63 | 62 | 63 | 62 | 62 | 61 | | | | | | | | | | | |
| 21 | P-55 | 221351 | 42 | yes | 63 | 62 | 62 | 62 | 63 | 63 | 61 | 63 | 61 | 61 | | | | | | | | | | | |
| 22 | P-56 | 221347 | 189 | yes | 62 | 61 | 62 | 62 | 63 | 61 | 61 | 61 | 63 | 62 | | | | | | | | | | | |
| 23 | P-57 | 221347 | 231 | yes | 61 | 62 | 63 | 63 | 63 | 64 | 62 | 63 | 62 | 62 | | | | | | | | | | | |
| 24 | P-58 | 221348 | 9 | yes | 62 | 61 | 61 | 61 | 61 | 62 | 61 | 62 | 62 | 63 | | | | | | | | | | | |
| 25 | P-59 | 221348 | 233 | | 61 | 61 | 62 | 62 | 61 | 63 | 63 | 63 | 62 | 62 | | | | | | | | | | | |

ATLANTIC COAST CONSULTING, INC

4407 x 22.5 99,157.50
233 x 22.5 5,242.50

104,400 sq ft.

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

MATERIAL TYPE: 60mil textured HPDE

DATE OF DEPLOYMENT: 6/13/08

DEPLOYMENT MONITOR(S): BM

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 2

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS | | | | | | | | | | | | | | | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | LEAD | | | | | LEFT SIDE | | | | | RIGHT SIDE | | | | | TRAIL | | | | | |
| | | | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | |
| 1 | P-60 | 221348 | 171 | yes | 62 | 63 | 63 | 62 | 62 | 62 | 63 | 63 | 62 | 61 | | | | | | | | | | | |
| 2 | P-61 | 221233 | 62 | yes | 61 | 61 | 62 | 63 | 63 | 61 | 61 | 62 | 62 | 62 | | | | | | | | | | | |
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| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

233 x 22.5 =
5242.50

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6/14/08

DEPLOYMENT MONITOR(S): BM / LF

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil Textured HDPE

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P62 | 221244 | 231 | yes | 63 | 63 | 62 | 61 | 61 | 62 | 61 | 62 | 63 | 62 | | | | | | | | | | | |
| 2 | P63 | 221244 | 199 | yes | 62 | 63 | 62 | 63 | 61 | 62 | 62 | 63 | 61 | 61 | | | | | | | | | | | |
| 3 | P64 | 221119 | 219 | yes | 63 | 62 | 63 | 63 | 62 | 62 | 62 | 61 | 62 | 61 | | | | | | | | | | | |
| 4 | P65 | 221119 | 165 | yes | 61 | 62 | 61 | 61 | 63 | 62 | 62 | 61 | 63 | 61 | | | | | | | | | | | |
| 5 | P-66 | 221119 | 41 | yes | 63 | 61 | 63 | 63 | 62 | 61 | 61 | 62 | 61 | 62 | | | | | | | | | | | |
| 6 | P67 | 221233 | 54 | yes | 62 | 62 | 61 | 63 | 62 | 61 | 62 | 62 | 63 | 63 | | | | | | | | | | | |
| 7 | P68 | 221360 | 204 x 15.5 | yes | 62 | 63 | 63 | 61 | 61 | 62 | 61 | 61 | 63 | 62 | | | | | | | | | | | 15.5' wide |
| 8 | P69 | 221360 | 202 | yes | 63 | 62 | 62 | 62 | 62 | 61 | 63 | 64 | 62 | 61 | | | | | | | | | | | -7 sump |
| 9 | P-70 | 221354 | 198 | yes | 63 | 63 | 62 | 61 | 63 | 62 | 61 | 63 | 62 | 61 | | | | | | | | | | | sump |
| 10 | P-71 | 221354 | 188 | yes | 62 | 61 | 63 | 62 | 62 | 63 | 62 | 63 | 61 | 61 | | | | | | | | | | | |
| 11 | P-72 | 221245 | 184 | yes | 61 | 63 | 62 | 61 | 61 | 62 | 63 | 61 | 63 | 63 | | | | | | | | | | | |
| 12 | P-73 | 221245 | 177 | yes | 62 | 61 | 61 | 62 | 62 | 63 | 63 | 62 | 63 | 62 | | | | | | | | | | | |
| 13 | P-74 | 221356 | 175 | yes | 63 | 62 | 63 | 61 | 61 | 62 | 62 | 61 | 63 | 61 | | | | | | | | | | | |
| 14 | P-75 | 221245 | 15 | yes | 62 | 61 | 61 | 63 | 62 | 63 | 61 | 62 | 62 | 61 | | | | | | | | | | | came off |
| 15 | P76 | 221245 | | yes | 62 | 61 | 62 | 63 | 62 | 62 | 62 | 63 | 63 | 63 | | | | | | | | | | | same pc |
| 16 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | 2038 | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

ATLANTIC COAST CONSULTING, INC

2038 x 22.5
45,855.
+ 204 x 15 = 3060

48915

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

MATERIAL TYPE: 60 mil Textured HDPE

DATE OF DEPLOYMENT: 6/16/08

DEPLOYMENT MONITOR(S): BM/LF

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 77 | 221350 | 407 | yes | 61 | 61 | 61 | 62 | 62 | 61 | 63 | 61 | 63 | 63 | | | | | | | | | | | |
| 2 | 78 | 221241 | 400 | yes | 61 | 62 | 62 | 61 | 63 | 63 | 61 | 61 | 62 | 63 | | | | | | | | | | | |
| 3 | 79 | 221356 | 41 | yes | 62 | 63 | 63 | 61 | 61 | 61 | 62 | 61 | 63 | 62 | | | | | | | | | | | |
| 4 | 80 | 221356 | 42 | yes | 60 | 63 | 61 | 61 | 62 | 63 | 61 | 61 | 62 | 62 | | | | | | | | | | | |
| 5 | 81 | 221225 | 416 | yes | 61 | 63 | 63 | 62 | 63 | 62 | 61 | 62 | 61 | 63 | | | | | | | | | | | |
| 6 | 82 | 221107 | 415 | yes | 62 | 62 | 62 | 61 | 62 | 61 | 63 | 63 | 64 | 63 | | | | | | | | | | | |
| 7 | 83 | 221354 | 40 | yes | 62 | 63 | 62 | 63 | 64 | 63 | 62 | 62 | 61 | 62 | | | | | | | | | | | |
| 8 | 84 | 221356 | 40 | yes | 61 | 61 | 63 | 62 | 63 | 63 | 61 | 61 | 62 | 61 | | | | | | | | | | | |
| 9 | 85 | 221358 | 420 | yes | 62 | 62 | 63 | 62 | 63 | 61 | 61 | 61 | 62 | 61 | | | | | | | | | | | |
| 10 | 86 | 221356 | 41 | yes | 63 | 63 | 62 | 63 | 63 | 62 | 62 | 61 | 62 | 61 | | | | | | | | | | | |
| 11 | 87 | 221104 | 415 | yes | 62 | 63 | 63 | 63 | 62 | 61 | 61 | 62 | 61 | 62 | | | | | | | | | | | |
| 12 | 88 | 221101 | 412 | yes | 61 | 62 | 62 | 62 | 62 | 61 | 62 | 61 | 61 | 62 | | | | | | | | | | | |
| 13 | 89 | 221356 | 27 | yes | 62 | 60 | 61 | 61 | 62 | 63 | 62 | 63 | 63 | 63 | | | | | | | | | | | |
| 14 | 90 | 221354 | 11 | yes | 61 | 63 | 62 | 63 | 61 | 61 | 61 | 62 | 62 | 63 | | | | | | | | | | | |
| 15 | 91 | 221242 | 39 | yes | 61 | 62 | 63 | 63 | 62 | 63 | 61 | 61 | 62 | 62 | | | | | | | | | | | |
| 16 | 92 | 221232 | 420 | yes | 62 | 61 | 62 | 63 | 62 | 62 | 63 | 63 | 61 | 61 | | | | | | | | | | | |
| 17 | 93 | 221110 | 420 | yes | 63 | 61 | 61 | 64 | 63 | 63 | 62 | 63 | 63 | 62 | | | | | | | | | | | |
| 18 | 94 | 221242 | 34 | yes | 62 | 63 | 62 | 62 | 62 | 61 | 62 | 62 | 63 | 63 | | | | | | | | | | | |
| 19 | 95 | 221242 | 34 | yes | 62 | 61 | 61 | 63 | 63 | 63 | 62 | 61 | 62 | 61 | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

4080 X 22.5 = 91,800

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6/17/08

DEPLOYMENT MONITOR(S): BM

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil textured HDPE

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 96 | 221111 | 416 | yes | 60 | 61 | 61 | 62 | 63 | 62 | 63 | 61 | 61 | 62 | | | | | | | | | | | |
| 2 | 97 | 220740 | 409 | yes | 61 | 62 | 62 | 63 | 62 | 62 | 61 | 61 | 62 | 63 | | | | | | | | | | | |
| 3 | 98 | 221242 | 43 | yes | 62 | 62 | 61 | 62 | 63 | 62 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 4 | 99 | 221242 | 44 | yes | 63 | 61 | 61 | 62 | 61 | 62 | 61 | 63 | 63 | 63 | | | | | | | | | | | |
| 5 | 100 | 221109 | 410 | yes | 62 | 63 | 62 | 63 | 64 | 62 | 62 | 63 | 63 | 61 | | | | | | | | | | | |
| 6 | 101 | 221242 | 413 | yes | 62 | 62 | 63 | 63 | 63 | 62 | 61 | 62 | 61 | 62 | | | | | | | | | | | |
| 7 | 102 | 221230 | 42 | yes | 61 | 62 | 63 | 63 | 61 | 61 | 62 | 63 | 64 | 61 | | | | | | | | | | | |
| 8 | 103 | 221242 | 41 | yes | 63 | 63 | 62 | 62 | 62 | 61 | 62 | 62 | 61 | 63 | | | | | | | | | | | |
| 9 | 104 | 221228 | 408 | yes | 62 | 62 | 63 | 63 | 62 | 63 | 63 | 62 | 63 | 61 | | | | | | | | | | | |
| 10 | 105 | 221231 | 408 | yes | 63 | 62 | 62 | 63 | 62 | 61 | 63 | 63 | 62 | 61 | | | | | | | | | | | |
| 11 | 106 | 221242 | 40 | yes | 62 | 61 | 61 | 62 | 61 | 61 | 63 | 61 | 62 | 63 | | | | | | | | | | | |
| 12 | 107 | 221242 | 40 | yes | 61 | 61 | 62 | 63 | 61 | 62 | 63 | 63 | 62 | 62 | | | | | | | | | | | |
| 13 | 108 | 221119 | 409 | yes | 62 | 63 | 63 | 62 | 63 | 62 | 62 | 62 | 61 | 62 | | | | | | | | | | | |
| 14 | 109 | 221242 | 40 | yes | 63 | 62 | 63 | 62 | 61 | 61 | 62 | 61 | 61 | 63 | | | | | | | | | | | |
| 15 | 110 | 221102 | 316 | yes | 62 | 61 | 62 | 63 | 63 | 62 | 63 | 61 | 60 | 61 | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | | | 3479 | x22.5 | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

Total 78277

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

DATE OF DEPLOYMENT: 6/18/08

PROJECT TITLE: CMS Landfill V Cell 2G

DEPLOYMENT MONITOR(S): BM

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil textured HDPE

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P-111 | 221240 | 306 | yes | 62 | 62 | 61 | 60 | 61 | 63 | 61 | 62 | 61 | 60 | | | | | | | | | | | |
| 2 | 112 | 221240 | 113 | yes | 62 | 62 | 61 | 61 | 62 | 60 | 61 | 65 | 63 | 62 | | | | | | | | | | | |
| 3 | 113 | 221243 | 189 | yes | 62 | 61 | 60 | 61 | 61 | 62 | 61 | 63 | 63 | 62 | | | | | | | | | | | |
| 4 | 114 | 221243 | 58 | yes | 62 | 63 | 62 | 63 | 62 | 63 | 61 | 62 | 61 | 62 | | | | | | | | | | | |
| 5 | 115 | 221243 | 56 | yes | 62 | 61 | 62 | 61 | 61 | 60 | 60 | 61 | 63 | 62 | | | | | | | | | | | |
| 6 | 116 | 221243 | 20 | yes | 62 | 60 | 60 | 61 | 62 | 61 | 63 | 61 | 61 | 62 | | | | | | | | | | | Δ |
| 7 | 117 | 221229 | 384 | yes | 61 | 60 | 61 | 62 | 63 | 63 | 61 | 63 | 62 | 62 | | | | | | | | | | | |
| 8 | 118 | 221117 | 388 | yes | 62 | 62 | 61 | 62 | 61 | 60 | 60 | 61 | 62 | 63 | | | | | | | | | | | |
| 9 | 119 | 220732 | 385 | yes | 62 | 61 | 60 | 61 | 60 | 62 | 60 | 62 | 63 | 62 | | | | | | | | | | | |
| 10 | 120 | 220723 | 59 | yes | 62 | 61 | 61 | 62 | 61 | 62 | 63 | 62 | 63 | 62 | | | | | | | | | | | |
| 11 | 121 | 220723 | 60 | yes | 60 | 61 | 62 | 60 | 61 | 60 | 63 | 63 | 62 | 63 | | | | | | | | | | | |
| 12 | 122 | 220723 | 62 | yes | 60 | 60 | 61 | 60 | 60 | 62 | 63 | 63 | 63 | 61 | | | | | | | | | | | |
| 13 | 123 | 220723 | 69 | yes | 62 | 63 | 62 | 63 | 64 | 63 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 14 | 124 | 220723 | 78 | yes | 61 | 62 | 62 | 63 | 63 | 62 | 63 | 62 | 63 | 61 | | | | | | | | | | | |
| 15 | 125 | 221224 | 76 | yes | 61 | 63 | 63 | 62 | 63 | 62 | 60 | 61 | 60 | 62 | | | | | | | | | | | |
| 16 | 126 | 221224 | 72 | yes | 61 | 62 | 63 | 61 | 62 | 62 | 61 | 62 | 63 | 64 | | | | | | | | | | | |
| 17 | 127 | 221224 | 68 | yes | 62 | 61 | 62 | 63 | 63 | 60 | 61 | 62 | 63 | 62 | | | | | | | | | | | |
| 18 | 128 | 221224 | off 123 | yes | 62 | 63 | 62 | 63 | 64 | 63 | 62 | 63 | 63 | 61 | | | | | | | | | | | came off P123 |
| 19 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | | | 2443 | x 22.5 | | | | | | | | | | | | | | | | | | | | | |
| 24 | | Total | 54,967 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 6/19/08

DEPLOYMENT MONITOR(S): BM

REVIEWED BY:

MATERIAL TYPE: 60mil Texture HDPE

SHEET NUMBER: 1 of 1

| LINE NUMBER | PANEL NUMBER | MATERIAL ROLL NUMBER | DEPLOYED LENGTH (L.F.) | OBSERVED PANEL OVERLAP | PANEL THICKNESS MEASUREMENTS LEAD 1 | LEAD 2 | LEAD 3 | LEAD 4 | LEAD 5 | LEFT SIDE 1 | LEFT SIDE 2 | LEFT SIDE 3 | LEFT SIDE 4 | LEFT SIDE 5 | RIGHT SIDE 1 | RIGHT SIDE 2 | RIGHT SIDE 3 | RIGHT SIDE 4 | RIGHT SIDE 5 | TRAIL 1 | TRAIL 2 | TRAIL 3 | TRAIL 4 | TRAIL 5 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 129 | 221224 | 193 | yes | 60 | 62 | 62 | 61 | 63 | 62 | 63 | 60 | 61 | 62 | | | | | | | | | | | |
| 2 | 130 | 221238 | 192 | yes | 61 | 62 | 63 | 63 | 62 | 63 | 62 | 61 | 61 | 60 | | | | | | | | | | | |
| 3 | 131 | 221238 | 91 | yes | 62 | 62 | 61 | 63 | 61 | 62 | 61 | 60 | 61 | 62 | | | | | | | | | | | |
| 4 | 132 | 221238 | 183 | yes | 63 | 63 | 64 | 62 | 63 | 61 | 62 | 60 | 60 | 61 | | | | | | | | | | | |
| 5 | 133 | 221105 | 152 | yes | 62 | 63 | 62 | 60 | 60 | 61 | 62 | 63 | 62 | 63 | | | | | | | | | | | |
| 6 | 134 | 221105 | 133 | yes | 63 | 62 | 63 | 62 | 63 | 60 | 61 | 60 | 61 | 62 | | | | | | | | | | | |
| 7 | 135 | 221105 | 36 | yes | 60 | 61 | 60 | 62 | 63 | 63 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 8 | 136 | 221105 | 3' | yes | 61 | 62 | 61 | 62 | 62 | 62 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 9 | 137 | 221237 | 155 | yes | 63 | 64 | 63 | 62 | 62 | 63 | 61 | 63 | 62 | 60 | | | | | | | | | | | |
| 10 | 138 | 221237 | 172 | yes | 62 | 61 | 62 | 60 | 60 | 61 | 63 | 63 | 62 | 63 | | | | | | | | | | | |
| 11 | 139 | 221223 | 257 | yes | 62 | 62 | 63 | 62 | 63 | 62 | 63 | 61 | 61 | 61 | | | | | | | | | | | |
| 12 | 140 | 221223 | 13 | yes | 62 | 62 | 61 | 62 | 61 | 62 | 60 | 61 | 61 | 61 | | | | | | | | | | | |
| 13 | 141 | 220723 | 78 | yes | 63 | 62 | 60 | 61 | 62 | 61 | 61 | 62 | 63 | 64 | | | | | | | | | | | |
| 14 | 142 | 220732 | 27 | yes | 60 | 61 | 62 | 63 | 62 | 63 | 63 | 62 | 61 | 60 | | | | | | | | | | | |
| 15 | 143 | 221114 | 56 | yes | 61 | 62 | 62 | 61 | 62 | 62 | 62 | 63 | 62 | 61 | | | | | | | | | | | |
| 16 | 144 | 221114 | 57 | yes | 61 | 61 | 61 | 62 | 63 | 63 | 62 | 63 | 62 | 63 | | | | | | | | | | | |
| 17 | 145 | 221114 | 58 | yes | 62 | 61 | 62 | 61 | 62 | 60 | 60 | 61 | 63 | 60 | | | | | | | | | | | |
| 18 | 146 | 221114 | 58 | yes | 60 | 62 | 62 | 63 | 64 | 60 | 61 | 62 | 61 | 62 | | | | | | | | | | | |
| 19 | 147 | 221114 | 60 | yes | 63 | 63 | 63 | 62 | 61 | 62 | 60 | 61 | 61 | 62 | | | | | | | | | | | |
| 20 | 148 | 221114 | 62 | yes | 60 | 62 | 62 | 61 | 62 | 61 | 60 | 60 | 61 | 62 | | | | | | | | | | | |
| 21 | 149 | 221349 | 66 | yes | 61 | 62 | 61 | 62 | 61 | 62 | 61 | 63 | 61 | 63 | | | | | | | | | | | |
| 22 | 150 | 221349 | 56 | yes | 63 | 63 | 62 | 63 | 62 | 61 | 61 | 61 | 63 | 62 | | | | | | | | | | | |
| 23 | 151 | 221349 | 30 | yes | 62 | 62 | 63 | 62 | 63 | 61 | 61 | 62 | 62 | 61 | | | | | | | | | | | |
| 24 | 152 | 221237 | 9 | yes | 62 | 62 | 61 | 62 | 60 | 61 | 63 | 62 | 61 | 62 | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | |

2233 x 22.5

50,242

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX H
## Trial Seam Logs

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/10/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM:

REVIEWED BY:

SHEET NUMBER: 1 of 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-1 | 1515 | 1208 | JC | 90° | 5.0 | 850 | 114 SE | 108 SE | 107 SE | 110 SE | 110 SE | 106 SE | 149 BRK | 145 BRK | 134 BRK | P | LF | S/S |
| TF-2 | 1630 | 1210 | EB | 90° | 5.0 | 450 | 106 SE | 106 SE | 99 SE | 104 SE | 113 SE | 116 SE | 134 BRK | 149 BRK | 145 BRK | P | LF | T/T |
| TF-3 | 1751 | " | " | 90° | 5.0 | 850 | 115 SE | 130 SE | 127 SE | 105 SE | 105 SE | 110 SE | 151 BRK | 149 BRK | 149 BRK | P | LF | S/S |
| TF-4 | 1840 | 1208 | JC | 90° | 4.5 | 850 | 112 SE | 119 SE | 121 SE | 120 SE | 121 SE | 124 SE | 143 BRK | 146 BRK | 143 BRK | P | LF | T/T |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/11/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-1 | 640 | 1209 | EB | 70° | 4.5 | 850 | 140 | 137 | 144 | 139 | 121 | 147 | 154 | 157 | 157 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-2 | 720 | 1208 | JC | " | 4.5 | 850 | 131 | 128 | 127 | 127 | 126 | 128 | 153 | 148 | 151 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-3 | 730 | " | " | " | 5.0 | 850 | 107 | 112 | 113 | 112 | 109 | 107 | 151 | 155 | 153 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TX-1 | 714 | 513 | BS | " | 500 | 500 | 115 | 124 | 125 | | | | 141 | 143 | 146 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TF-4 | 740 | 1209 | EB | " | 5.0 | 850 | 111 | 122 | 107 | 107 | 111 | 118 | 161 | 161 | 163 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-5 | 900 | 1210 | MB | 80 | 4.5 | 850 | 118 | 124 | 122 | 122 | 127 | 119 | 148 | 151 | 153 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-6 | 1310 | 1208 | JC | 94 | 5.0 | 850 | 109 | 108 | 108 | 122 | 122 | 119 | 144 | 151 | 152 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-7 | 1320 | 1209 | EB | " | 5.0 | 850 | 101 | 121 | 107 | 116 | 102 | 120 | 143 | 147 | 147 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-8 | 1330 | 1210 | MB | " | 4.5 | 850 | 133 | 127 | 134 | 122 | 120 | 127 | 140 | 142 | 140 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-9 | 1520 | 1209 | EB | " | 4.5 | 850 | 128 | 128 | 130 | 127 | 121 | 126 | 143 | 143 | 138 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |

ATLANTIC COAS[illegible] [illegible]ONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/12/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tx-1 | 615 | 013 | IS | 75° | — | 550/550 | 126 | 140 | 133 | | | | 159 | 162 | 160 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| Tx-2 | 634 | 513 | JC | " | — | 450/550 | 143 | 151 | 149 | | | | 149 | 157 | 151 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| Tx-3 | 715 | 513 | EB | " | — | 450/550 | 142 | 137 | 120 | | | | 149 | 148 | 145 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TF-1 | 1305 | 1210 | EB | 90° | 6.0 | 850 | 118 | 117 | 110 | 114 | 107 | 106 | 148 | 152 | 148 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-2 | 1254 | 1208 | JC | " | 5.0 | 850 | 119 | 110 | 107 | 118 | 114 | 106 | 146 | 150 | 149 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-3 | 1247 | " | " | " | 4.5 | 850 | 146 | 124 | 127 | 136 | 136 | 133 | 141 | 145 | 145 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-4 | 1300 | 1210 | EB | " | 5.0 | 850 | 139 | 145 | 145 | 139 | 139 | 152 | 145 | 151 | 155 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TX-4 | 1335 | 513 | BS | " | — | 450/550 | 137 | 137 | 149 | | | | 160 | 166 | 167 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/13/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 2

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-1 | 0631 | 513 | BS | 75° | — | 400/550 | 128 SE | 116 SE | 140 SE | | | | 155 BRK | 154 BRK | 153 BRK | P | LF | T/T |
| TF-1 | 0642 | 1210 | EB | " | 6.0 | 850 | 122 SE | 109 SE | 116 SE | 133 SE | 118 SE | 109 SE | 175 BRK | 175 BRK | 172 BRK | P | LF | S/S |
| TF-2 | 0642 | 1208 | JC | " | 5.0 | 850 | 122 SE | 128 SE | 130 SE | 128 SE | 137 SE | 133 SE | 157 BRK | 170 BRK | 168 BRK | P | LF | S/S |
| TF-3 | 0645 | " | " | " | 4.5 | 850 | 118 SE | 115 SE | 110 SE | 126 SE | 122 SE | 126 SE | 163 BRK | 162 BRK | 162 BRK | P | LF | T/T |
| TF-4 | 0625 | 1210 | EB | " | 5.0 | 850 | 157 SE | 142 SE | 142 SE | 154 SE | 146 SE | 151 SE | 163 BRK | 165 BRK | 164 BRK | P | LF | T/T |
| TF-5 | 1225 | 1210 | EB | 92° | 5.0 | 850 | 122 SE | 137 SE | 145 SE | 130 SE | 142 SE | 145 SE | 148 BRK | 152 BRK | 154 BRK | P | LF | T/T |
| TF-6 | 1230 | " | " | " | 6.0 | 850 | 127 SE | 117 SE | 114 SE | 124 SE | 121 SE | 124 SE | 151 BRK | 151 BRK | 148 BRK | P | LF | S/S |
| TF-7 | 1225 | 1208 | JC | " | 5.0 | 850 | 130 SE | 110 SE | 121 SE | 110 SE | 107 SE | 109 SE | 148 BRK | 151 BRK | 146 BRK | P | LF | S/S |
| TF-8 | 1227 | " | " | " | 4.5 | 850 | 142 SE | 142 SE | 140 SE | 142 SE | 136 SE | 131 SE | 147 BRK | 147 BRK | 150 BRK | P | LF | T/T |
| TX-2 | 1225 | 513 | BS | " | — | 400/550 | 134 SE | 122 SE | 142 SE | | | | 146 BRK | 149 BRK | 147 BRK | P | LF | T/T |

ATLANTIC COAS[illegible] ONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/13/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM:

REVIEWED BY:

SHEET NUMBER: 2 OF 2

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-9 | 1720 | 1208 | JC | 90° | 4.5 | 850 | 107 SE | 119 SE | 127 SE | 117 SE | 128 SE | 134 SE | 146 BRK | 149 BRK | 150 BRK | P | LF | S/T |
| | | | | | | | | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/14/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-1 | 647 | 513 | BS | 75° | — | 459 / 550 | 146 SE | 139 SE | 148 SE | | | | 177 BRK | 178 BRK | 177 BRK | P | LF | T/T |
| TF-1 | 650 | 1210 | EB | " | 5.0 | 850 | 157 SE | 154 SE | 157 SE | 155 SE | 152 SE | 154 SE | 178 BRK | 186 BRK | 183 BRK | P | LF | T/T |
| TF-2 | 655 | " | " | " | 6.0 | 850 | 118 SE | 125 SE | 114 SE | 122 SE | 106 SE | 107 SE | 142 BRK | 163 BRK | 160 BRK | P | LF | S/S |
| TF-3 | 654 | 1208 | JC | " | 5.0 | 850 | 111 SE | 112 SE | 113 SE | 118 SE | 121 SE | 124 SE | 172 BRK | 157 BRK | 155 BRK | P | LF | S/S |
| TF-4 | 656 | " | " | " | 4.5 | 850 | 154 SE | 146 SE | 146 SE | 151 SE | 143 SE | 143 SE | 178 BRK | 169 BRK | 169 BRK | P | LF | T/T |
| TF-5 | 1025 | 1209 | ER | 80° | 5.0 | 850 | 102 SE | 115 SE | 120 SE | 124 SE | 121 SE | 109 SE | 142 BRK | 139 BRK | 136 BRK | P | LF | S/S |
| TF-6 | 1315 | 1208 | JC | 85° | 4.5 | 850 | 114 SE | 121 SE | 119 SE | 107 SE | 107 SE | 116 SE | 152 BRK | 145 BRK | 142 BRK | P | LF | S/T |
| TX-2 | 1330 | 013 | EB | 90° | — | 400 / 550 | 106 SE | 107 SE | 100 SE | | | | 139 BRK | 151 BRK | 145 BRK | P | LF | T/T |
| TX-3 | 1335 | 513 | JS | " | — | 400 / 550 | 131 SE | 130 SE | 137 SE | | | | 139 BRK | 140 BRK | 139 BRK | P | LF | T/T |
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ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/16/08

TF - # = FUSION SEAM:

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY:

SHEET NUMBER: 1 OF 2

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | OUTSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | SHEAR STRENGTH/MODE 1 | 2 | 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-1 | 0725 | 1208 | JC | 75° | 5.0 | 850 | 121 | 110 | 126 | 112 | 109 | 107 | 166 | 164 | 164 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-2 | 0720 | " | " | " | 4.5 | " | 151 | 142 | 151 | 155 | 143 | 158 | 161 | 164 | 160 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-3 | 0750 | 1210 | EB | " | 6.0 | " | 111 | 107 | 111 | 124 | 113 | 113 | 153 | 156 | 151 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-4 | 0753 | " | " | " | 5.0 | " | 137 | 146 | 142 | 146 | 146 | 146 | 172 | 164 | 172 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-5 | 0900 | 1209 | WB | " | 5.0 | " | 108 | 107 | 111 | 116 | 114 | 121 | 161 | 158 | 160 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-6 | 0905 | " | " | " | 5.0 | " | 124 | 137 | 140 | 142 | 146 | 157 | 163 | 160 | 162 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TX-1 | 0954 | 513 | BS | 80° | — | 400/500 | 112 | 142 | 142 | | | | 143 | 145 | 143 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TF-7 | 1300 | 1208 | JC | 94° | 4.5 | 850 | 110 | 113 | 112 | 113 | 118 | 122 | 138 | 139 | 141 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-8 | 1258 | " | " | " | 5.5 | " | 122 | 119 | 120 | 120 | 108 | 109 | 139 | 143 | 142 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-9 | 1300 | 1210 | EB | " | 6.0 | " | 98 | 102 | 108 | 103 | 111 | 113 | 141 | 140 | 143 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/16/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 2 OF 2

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-10 | 1304 | 1210 | EB | 94° | 5.0 | 850 | 130 | 126 | 127 | 122 | 131 | 121 | 146 | 144 | 143 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-11 | 1340 | 1209 | MB | " | 5.0 | 850 | 117 | 118 | 139 | 114 | 112 | 119 | 141 | 143 | 139 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TX-2 | 1300 | 513 | BS | " | — | | 137 | 140 | 139 | | | | 149 | 151 | 147 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
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# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/17/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | OUTSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | SHEAR STRENGTH/MODE 1 | 2 | 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-1 | 0636 | 1208 | JC | 72° | 5.5 | 850° | 110 | 112 | 118 | 121 | 116 | 119 | 166 | 166 | 166 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-2 | 0640 | " | " | " | 4.5 | " | 134 | 140 | 127 | 122 | 145 | 127 | 154 | 148 | 142 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-3 | 0630 | 1210 | EB | " | 6.0 | " | 104 | 112 | 107 | 119 | 122 | 117 | 164 | 168 | 168 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-4 | 0635 | " | " | " | 5.0 | " | 139 | 139 | 149 | 140 | 136 | 151 | 169 | 155 | 157 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TX-1 | 0651 | 513 | BS | " | — | 400 / 500 | 104 | 122 | 110 | | | | 204 | 202 | 207 | P | LF | T/T |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TF-5 | 0845 | 1209 | MB | " | 5.5 | 850° | 139 | 134 | 139 | 141 | 142 | 151 | 168 | 168 | 169 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-6 | 1247 | 1208 | JC | 90° | 5.5 | 850° | 122 | 127 | 126 | 121 | 124 | 124 | 163 | 158 | 157 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-7 | 1245 | " | " | 90° | 4.5 | " | 119 | 139 | 140 | 143 | 148 | 152 | 160 | 160 | 154 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-8 | 1305 | 1210 | EB | " | 6.0 | " | 109 | 110 | 116 | 121 | 111 | 127 | 151 | 151 | 145 | P | LF | S/S |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |
| TF-9 | 1309 | " | " | " | 5.0 | " | 142 | 142 | 134 | 127 | 139 | 130 | 148 | 157 | 148 | P | LF | T/T |
| | | | | | | | SE | SE | SE | SE | SE | SE | BRK | BRK | BRK | | | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/18/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-1 | 0650 | 1208 | JC | 65° | 4.5 | 850° | 146 SE | 140 SE | 148 SE | 146 SE | 145 SE | 165 SE | 177 BRK | 181 BRK | 170 BRK | P | LF | T/T |
| TF-2 | 0654 | " | " | " | 5.5 | " | 119 SE | 121 SE | 117 SE | 130 SE | 128 SE | 130 SE | 186 BRK | 181 BRK | 183 BRK | P | LF | S/S |
| TF-3 | 0630 | 1210 | EB | " | 6.0 | " | 114 SE | 112 SE | 117 SE | 122 SE | 131 SE | 119 SE | 187 BRK | 181 BRK | 175 BRK | P | LF | S/S |
| TF-4 | 0640 | " | " | " | 5.0 | " | 163 SE | 159 SE | 163 SE | 122 SE | 148 SE | 154 SE | 158 BRK | 175 BRK | 173 BRK | P | LF | T/T |
| TX-1 | 0644 | 513 | BS | " | — | 400/500 | 160 SE | 145 SE | 150 SE | | | | 161 BRK | 166 BRK | 161 BRK | P | LF | T/T |
| TF-5 | 1303 | 1208 | JC | 90° | 5.5 | 850° | 122 SE | 128 SE | 119 SE | 124 SE | 130 SE | 136 SE | 148 BRK | 152 BRK | 152 BRK | P | LF | S/S |
| TF-6 | 1305 | " | " | " | 4.5 | " | 128 SE | 130 SE | 131 SE | 133 SE | 130 SE | 142 SE | 152 BRK | 155 BRK | 136 BRK | P | LF | T/T |
| TF-7 | 1305 | 1210 | EB | " | 6.0 | " | 115 SE | 112 SE | 115 SE | 118 SE | 131 SE | 125 SE | 145 BRK | 161 BRK | 146 BRK | P | LF | S/S |
| TF-8 | 1310 | " | " | " | 5.0 | " | 131 SE | 133 SE | 127 SE | 133 SE | 136 SE | 127 SE | 175 BRK | 170 BRK | 157 BRK | P | LF | T/T |
| TX-2 | 1330 | 513 | ER | " | — | 550/550 | 158 SE | 160 SE | 158 SE | | | | 167 BRK | 167 BRK | 166 BRK | P | LF | T/T |

ATLANTIC COAS[illegible] [illegible]ONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6/19/08

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 2

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | OUTSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | SHEAR STRENGTH/MODE 1 | 2 | 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-1 | 0634 | 513 | BS | 65° | — | 500 / 550 | 146 SE | 160 SE | 150 SE | | | | 222 BRK | 222 BRK | 229 BRK | P | LF | T/T |
| TF-1 | 0645 | 1208 | JC | 65° | 5.5 | 850° | 121 SE | 121 SE | 118 SE | 134 SE | 130 SE | 129 SE | 192 BRK | 187 BRK | 189 BRK | P | LF | S/S |
| TF-2 | 0643 | 1208 | JC | 65° | 4.5 | 850° | 143 SE | 150 SE | 151 SE | 143 SE | 142 SE | 140 SE | 184 BRK | 177 BRK | 182 BRK | P | LF | T/T |
| TF-3 | 0630 | 1209 | EB | 65° | 5.0 | 850° | 122 SE | 110 SE | 118 SE | 143 SE | 131 SE | 124 SE | 180 BRK | 192 BRK | 186 BRK | P | LF | S/S |
| TF-4 | 0635 | 1209 | EB | 65° | 4.5 | 850° | 139 SE | 136 SE | 148 SE | 139 SE | 127 SE | 145 SE | 189 BRK | 174 BRK | 189 BRK | P | LF | T/T |
| TF-5 | 0945 | 1209 | EB | 75° | 4.5 | 850 | 127 SE | 125 SE | 127 SE | 122 SE | 112 SE | 110 SE | 152 BRK | 154 BRK | 154 BRK | P | TS | T/S |
| TF-6 | 1230 | 1208 | JC | 82° | 5.5 | 850 | 114 SE | 117 SE | 116 SE | 110 SE | 120 SE | 116 SE | 139 BRK | 139 BRK | 139 BRK | P | TS | S/S |
| TF-7 | 1240 | 1208 | JC | 82° | 4.5 | 850 | 148 SE | 131 SE | 140 SE | 142 SE | 142 SE | 143 SE | 157 BRK | 159 BRK | 157 BRK | P | TS | T/T |
| TF-8 | 1250 | 1209 | EB | 82° | 5.0 | 850 | 117 SE | 116 SE | 116 SE | 118 SE | 110 SE | 110 SE | 148 BRK | 145 BRK | 152 BRK | P | TS | S/S |
| TF-9 | 0955 | 1209 | EB | 82° | 4.5 | 850 | 124 SE | 127 SE | 130 SE | 112 SE | 112 SE | 110 SE | 146 BRK | 143 BRK | 143 BRK | P | TS | T/T |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6-19-08

TF - # = FUSION SEAM:

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: TS

SHEET NUMBER: 2 of 2

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-2 | 1410 | 513 | BS | 82° | — | 500/550 | 137 SE | 118 SE | 121 SE | | | | 141 BRK | 145 BRK | 144 BRK | P | TS | |
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ATLANTIC COAS[illegible] ONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6-20-08

TF - # = FUSION SEAM:

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY:

SHEET NUMBER: 1 of

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | OUTSIDE PEEL STRENGTH/MODE 1 | 2 | 3 | SHEAR STRENGTH/MODE 1 | 2 | 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-1 | 0630 | 513 | EB | 68° | — | 550/450 | 119 | 118 | 127 | | | | 160 | 162 | 142 | P | TS | |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TX-2 | 0630 | 013 | IS | 68° | — | 500/550 | 151 | 142 | 154 | | | | 172 | 178 | 148 | P | TS | |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TX-3 | 1305 | 013 | IS | 85° | — | 500/550 | 130 | 131 | 127 | | | | 146 | 144 | 149 | P | TS | |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TX-4 | 1301 | 513 | EB | 85° | — | 400/550 | 117 | 124 | 127 | | | | 151 | 147 | 146 | P | TS | |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6-21-08

TF - # = FUSION SEAM:

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY:

SHEET NUMBER: 1 of 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-1 | 0615 | 513 | EB | 68° | — | 450/550 | 137 | 127 | 139 | | | | 159 | 155 | 160 | P | TS | |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
| TX-2 | 0630 | 013 | IS | 68° | — | 500/550 | 128 | 126 | 124 | | | | 170 | 168 | 173 | P | TS | |
| | | | | | | | SE | SE | SE | | | | BRK | BRK | BRK | | | |
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ATLANTIC COAS[illegible] ONSULTING, INC

# GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 6-24-08

TF - # = FUSION SEAM:

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY:

SHEET NUMBER: 1 of 1

| SAMPLE NUMBER | APPROX. TIME | WELDING MACHINE NUMBER | WELDING TECH. | AMBIENT AIR TEMP. | MACHINE SPEED | TEMP. SETTING | INSIDE PEEL STRENGTH/MODE 1 | INSIDE PEEL STRENGTH/MODE 2 | INSIDE PEEL STRENGTH/MODE 3 | OUTSIDE PEEL STRENGTH/MODE 1 | OUTSIDE PEEL STRENGTH/MODE 2 | OUTSIDE PEEL STRENGTH/MODE 3 | SHEAR STRENGTH/MODE 1 | SHEAR STRENGTH/MODE 2 | SHEAR STRENGTH/MODE 3 | PASS OR FAIL | CQA MONITOR'S INITIALS | REMARKS OR COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TX-1 | 07:20 | 513 | IS | 75° | | 500/550 | 116 SE | 154 SE | 157 SE | | | | 168 BRK | 170 BRK | 170 BRK | P | RTH | |
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ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX I

## Seam Logs

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/10/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: Ø

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P1 | P2 | NEOS | SEOS | 1634 | JC | 5.0 | 850 | 406 | 70 / 336 | DS-1 | LF | | 6/10/08 | BM |
| 2 | P3 | P4 | NEOS | SEOS | 1724 | " | " | " | 40 | 376 | — | LF | | 6/10/08 | BM |
| 3 | P2 | P5 | NEOS | SEOS | 1737 | " | " | " | 404 | 480 / 300 | DS-3 | LF | | 6/10/08 | BM |
| 4 | P2 | P6 | NEOS | SEOS | 1826 | " | " | " | 5 | 305 | — | LF | | 6/10/08 | BM |
| 5 | P4 | P6 | NEOS | SEOS | 1827 | " | " | " | 38 | 343 | — | LF | | 6/10/08 | BM |
| 6 | P7 | P8 | NEOS | SEOS | 1843 | " | 4.5 | " | 22 | 365 | — | LF | | 6/11/08 | BM |
| 7 | P7 | P9 | NEOS | SEOS | 1914 | " | 5.0 | " | 404 | 480 / 289 | DS-5 | LF | | 6/11/08 | BM |
| 8 | P8 | P10 | NEOS | SEOS | 2004 | " | " | " | 43 | 332 | — | LF | | 6/11/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 1362

DESTRUCTIVE LENGTH CARRY - OVER: 332

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/10/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: Ø

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P1 | P3 | WEOS | EEOS | 1643 | EB | 5.0 | 450 | 22 | 22 | — | LF | | 6/10/08 | BM |
| 2 | P2 | P4 | WEOS | EEOS | 1649 | " | " | " | 22 | ~~33~~ 11 | DS-2 | LF | | 6/10/08 | BM |
| 3 | P5 | P6 | WEOS | EEOS | 1739 | " | " | " | 22 | 33 | — | LF | | 6/10/08 | BM |
| 4 | P5 | P7 | NEOS | SEOS | 1813 | " | " | 850 | 406 | 439 | — | LF | | 6/11/08 | BM |
| 5 | P6 | P8 | NEOS | SEOS | 1920 | " | " | " | 43 | ~~475~~ 7 | DS-4 | LF | | 6/11/08 | BM |
| 6 | P9 | P10 | WEOS | EEOS | 1932 | " | " | 450 | 22 | 29 | — | LF | | 6/11/08 | BM |
| 7 | TIE-IN | P9 | EEOS | WEOS | 1941 | " | " | " | 22 | 51 | — | LF | | 6/11/08 | BM |
| 8 | TIE-IN | P7 | EEOS | WEOS | 1946 | " | " | " | 22 | 73 | — | LF | | 6/11/08 | BM |
| 9 | TIE-IN | P5 | EEOS | WEOS | 1951 | " | " | " | 22 | 95 | — | LF | | 6/11/08 | BM |
| 10 | TIE-IN | P2 | EEOS | WEOS | 1956 | " | " | " | 22 | 117 | — | LF | | 6/11/08 | BM |
| 11 | TIE-IN | P1 | EEOS | WEOS | 2001 | " | " | " | 22 | 139 | — | LF | | 6/11/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 647

DESTRUCTIVE LENGTH CARRY - OVER: 139

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/11/08

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1208

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 332

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P9 | P11 | NEOS | SEOS | 752 | JC | 5.0 | 850 | 403 | 135 ~~488~~ 355 | DS-6 | LF | | 6/11/08 | BM |
| 2 | P10 | P11 | NEOS | SEOS | 846 | " | " | " | 3 | 258 | — | LF | | 6/11/08 | BM |
| 3 | P10 | P13 | NEOS | SEOS | 847 | " | " | " | 40 | 298 | — | LF | | 6/11/08 | BM |
| 4 | P12 | P14 | NEOS | SEOS | 854 | " | 4.5 | " | 22 | 320 | — | LF | | 6/11/08 | BM |
| 5 | P12 | P15 | NEOS | SEOS | 902 | " | 5.0 | " | 396 | ~~480~~ 238 | DS-8 | LF | | 6/11/08 | BM |
| 6 | P14 | P15 | NEOS | SEOS | 955 | " | " | " | 9 | 245 | — | LF | | 6/11/08 | BM |
| 7 | P14 | P17 | NEOS | SEOS | 957 | " | " | " | 39 | 284 | — | LF | | 6/11/08 | BM |
| 8 | P16 | P19 | NEOS | SEOS | 1032 | " | " | " | 408 | ~~480~~ 212 | DS-10 | LF | | 6/11/08 | BM |
| 9 | P18 | P19 | NEOS | SEOS | 1119 | " | " | " | 4 | 216 | — | LF | | 6/11/08 | BM |
| 10 | P18 | P21 | NEOS | SEOS | 1120 | " | " | " | 37 | 253 | — | LF | | 6/11/08 | BM |
| 11 | P20 | P23 | NEOS | SEOS | 1343 | " | " | " | 409 | ~~480~~ 183 | DS-12 | LF | | 6/11/08 | BM |
| 12 | P22 | P25 | NEOS | SEOS | 1429 | " | " | " | 35 | 217 | — | LF | | 6/11/08 | BM |
| 13 | P24 | P27 | NEOS | SEOS | 1455 | " | " | " | 412 | ~~480~~ 149 | DS-14 | LF | | 6/12/08 | BM |
| 14 | P26 | P28 | NEOS | SEOS | 1546 | " | " | " | 34 | 183 | — | LF | | 6/11/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 2251

DESTRUCTIVE LENGTH CARRY - OVER: 183

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/11/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1209

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: Ø

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 - | P11 | P13 | WEOS | EEOS | 808 | EB | 4.5 | 850 | 22 | 22 | — | LF | | 6/11/08 | BM |
| 2 - | P11 | P12 | NEOS | SEOS | 823 | " | 5.0 | " | 406 | ~~97~~ 331 | DS-7 | LF | | 6/11/08 | BM |
| 3 - | P11 | P14 | NEOS | SEOS | 912 | " | " | " | 9 | 340 | — | LF | | 6/11/08 | BM |
| 4 - | P13 | P14 | NEOS | SEOS | 913 | " | " | " | 39 | 379 | — | LF | | 6/11/08 | BM |
| 5 - | P15 | P16 | NEOS | SEOS | 926 | " | " | " | 407 | ~~480~~ 306 | DS-9 | LF | | 6/11/08 | BM |
| 6 - | P17 | P18 | NEOS | SEOS | 1017 | " | " | " | 39 | 345 | — | LF | | 6/11/08 | BM |
| 7 - | P19 | P20 | NEOS | SEOS | 1115 | " | " | " | 409 | ~~480~~ 274 | DS-11 | LF | | 6/11/08 | BM |
| 8 - | P21 | P22 | NEOS | SEOS | 1206 | " | " | " | 34 | 308 | — | LF | | 6/11/08 | BM |
| 9 - | P23 | P24 | NEOS | SEOS | 1412 | " | " | " | 412 | ~~480~~ 240 | DS-13 | LF | | 6/11/08 | BM |
| 10 - | P25 | P26 | NEOS | SEOS | 1508 | " | " | " | 34 | 274 | — | LF | | 6/11/08 | BM |
| 11 | TIE-IN | P27 | EEOS | WEOS | 1546 | " | 4.5 | " | 22 | 296 | — | LF | | 6/12/08 | BM |
| 12 | TIE-IN | P24 | EEOS | WEOS | 1551 | " | " | " | 22 | 318 | — | LF | | 6/12/08 | BM |
| 13 | TIE-IN | P23 | EEOS | WEOS | 1556 | " | " | " | 22 | 340 | — | LF | | 6/12/08 | BM |
| 14 | TIE-IN | P20 | EEOS | WEOS | 1601 | " | " | " | 22 | 362 | — | LF | | 6/12/08 | BM |
| 15 | TIE-IN | P19 | EEOS | WEOS | 1606 | " | " | " | 22 | 384 | — | LF | | 6/12/08 | BM |
| 16 | TIE-IN | P16 | EEOS | WEOS | 1611 | " | " | " | 22 | 406 | — | LF | | 6/12/08 | BM |
| 17 | TIE-IN | P15 | EEOS | WEOS | 1616 | " | " | " | 22 | 428 | — | LF | | 6/12/08 | BM |
| 18 | TIE-IN | P12 | EEOS | WEOS | 1621 | " | " | " | 22 | 450 | — | LF | | 6/12/08 | BM |
| 19 | TIE-IN | P11 | EEOS | WEOS | 1626 | " | " | " | 22 | ~~461~~ 11 | DS-15 | LF | | 6/12/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 2009

DESTRUCTIVE LENGTH CARRY - OVER: 11

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/11/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 139

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P15 | P17 | WEOS | EEOS | 930 | MB | 4.5 | 850 | 22 | 161 | — | LF | | 6/11/08 | BM |
| 2 | P16 | P18 | WEOS | EEOS | 941 | " | " | " | 22 | 183 | — | LF | | 6/11/08 | BM |
| 3 | P19 | P21 | WEOS | EEOS | 1117 | " | " | " | 22 | 205 | — | LF | | 6/11/08 | BM |
| 4 | P20 | P22 | WEOS | EEOS | 1123 | " | " | " | 22 | 227 | — | LF | | 6/11/08 | BM |
| 5 | P23 | P25 | WEOS | EEOS | 1421 | " | " | " | 22 | 249 | — | LF | | 6/11/08 | BM |
| 6 | P24 | P26 | WEOS | EEOS | 1427 | " | " | " | 22 | 271 | — | LF | | 6/11/08 | BM |
| 7 | P27 | P28 | WEOS | EEOS | 1507 | " | " | " | 22 | 293 | — | LF | | 6/12/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 154

DESTRUCTIVE LENGTH CARRY - OVER: 293

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/12/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 183

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P27 | P29 | NEOS | SEOS | 1347 | JC | 5.0 | 850 | 409 | ~~480~~ 112 | DS-16 | LF | | 6/12/08 | BM |
| 2 | P28 | P30 | NEOS | SEOS | 1442 | " | " | " | 33 | 145 | – | LF | | 6/12/08 | BM |
| 3 | P31 | P33 | NEOS | SEOS | 1504 | " | " | " | 413 | ~~480~~ 78 | DS-18 | LF | | 6/12/08 | BM |
| 4 | P32 | P34 | NEOS | SEOS | 1547 | " | " | " | 34 | 112 | — | LF | | 6/12/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 34

DESTRUCTIVE LENGTH CARRY - OVER: 112

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/12/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 293

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P29 | P30 | WEDS | EEDS | 1358 | EB | 5.0 | 850 | 22 | 315 | — | LF | | 6/12/08 | BM |
| 2 | P29 | P31 | NEDS | SEDS | 1429 | " | 6.0 | 850 | 411 | 480 / 246 | DS-17 | LF | | 6/12/08 | BM |
| 3 | P30 | P32 | NEDS | SEDS | 1522 | " | " | " | 33 | 279 | — | LF | | 6/12/08 | BM |
| 4 | P31 | P32 | WEDS | EEDS | 1527 | " | 5.0 | 850 | 22 | 301 | — | LF | | 6/12/08 | BM |
| 5 | P33 | P34 | WEDS | EEDS | 1534 | " | " | " | 22 | 323 | — | LF | | 6/12/08 | BM |
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DAILY TOTAL FOR WELDED SEAM: 510

DESTRUCTIVE LENGTH CARRY - OVER: 323

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/12/08

FUSION SEAM:

EXTRUSION SEAM: ✓

REVIEWED BY: A

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 280

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | TIE-IN | P29 | WEOS | 3I | 1426 | BS | — | ~~450~~ 550 | 7 | 287 | — | LF | | 6/12/08 | LF |
| 2 | TIE IN | P29 | 3I | EEOS | 1430 | " | — | " | 14 | 291 305 | — | LF | | 6/12/08 | LF |
| 3 | TIE IN | P31 | WEOS | 3N | 1506 | " | — | " | 7 | 309 – 316 | — | LF | | 6/12/08 | LF |
| 4 | TIE IN | P31 | 3N | EEOS | 1525 | " | — | " | 14 | 320 – 334 | — | LF | | 6/12/08 | LF |
| 5 | TIE IN | P33 | WEOS | 3Q | 1533 | " | — | " | 7 | 338 – 345 | — | LF | | 6/12/08 | LF |
| 6 | TIE IN | P33 | 3Q | 5' F. EEOS | 1536 | " | — | " | 9 | 349 – 358 | — | LF | | 6/12/08 | LF |
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DAILY TOTAL FOR WELDED SEAM: 58 Seaming log only

DESTRUCTIVE LENGTH CARRY - OVER: 370 Seaming and Repair logs

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/13/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 112

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P33 | P35 | NEOS | SEOS | 0710 | JC | 5.0 | 850 | 405 | 480 / 37 | DS-19 | LF | | 6/13 | BM |
| 2 | P34 | P36 | NEOS | SEOS | 0805 | " | " | " | 36 | 73 | — | LF | | 6/13 | BM |
| 3 | P37 | P38 | WEOS | EEOS | 0811 | " | 4.5 | " | 22 | 95 | — | LF | | 6/13 | BM |
| 4 | P37 | P39 | NEOS | SEOS | 0837 | " | 5.0 | " | 406 | 480 / 21 | DS-21 | LF | | 6/13 | BM |
| 5 | P38 | P40 | NEOS | SEOS | 0926 | " | " | " | 36 | 57 | — | LF | | 6/13 | BM |
| 6 | P41 | P43 | NEOS | SEOS | 1003 | " | " | " | 411 | 468 | — | LF | | 6/13 | BM |
| 7 | P42 | P44 | NEOS | SEOS | 1053 | " | " | " | 35 | 480 / 23 | DS-23 | LF | | 6/13 | BM |
| 8 | P45 | P48 | EEOS | WEOS | 1320 | " | " | " | 115 | 138 | — | LF | | 6/14 | BM |
| 9 | P45 | P47 | EEOS | WEOS | 1330 | " | " | " | 143 | 281 | — | LF | | 6/14 | BM |
| 10 | P49 | P50 | EEOS | WEOS | 1357 | " | " | " | 55 | 336 | — | LF | | 6/14 | BM |
| 11 | P52 | P53 | NEOS | SEOS | 1436 | " | 4.5 | " | 22 | 358 | — | LF | | 6/14 | BM |
| 12 | P51 | P53 | EEOS | WEOS | 1446 | " | 5.0 | " | 94 | 452 | — | LF | | 6/14 | BM |
| 13 | P51 | P52 | EEOS | WEOS | 1500 | " | " | " | 154 | 480 / 126 | DS-25 | LF | | 6/14 | BM |
| 14 | P55 | P56 | NEOS | SEOS | 1525 | " | 4.5 | " | 22 | 148 | — | LF | | 6/14 | BM |
| 15 | P54 | P56 | EEOS | WEOS | 1532 | " | 5.0 | " | 181 | 329 | — | LF | | 6/14 | BM |
| 16 | P54 | P55 | EEOS | EEOS | 1600 | " | " | " | 58 | 387 | — | LF | | 6/14 | BM |
| 17 | P57 | P58 | NEOS | SEOS | 1620 | " | 4.5 | " | 22 | 409 | — | LF | | 6/16 | LP |
| 18 | P57 | P59 | EEOS | WEOS | 1636 | " | 5.0 | " | 224 | 480 / 153 | DS-27 | LF | | 6/14 | BM |
| 19 | P58 | P59 | EEOS | WEOS | 1707 | " | " | " | 6 | 159 | — | LF | | 6/14 | BM |
| 20 | P43 | P45 | NEOS | SEOS | 1734 | " | 4.5 | " | 6 | 165 | — | LF | | 6/14 | BM |
| 21 | P43 | P47 | NEOS | SEOS | 1735 | " | " | " | 22 | 187 | — | LF | | 6/14 | BM |
| 22 | P43 | P51 | NEOS | SEOS | 1737 | " | " | " | 22 | 209 | — | LF | | 6/14 | BM |

DAILY TOTAL FOR WELDED SEAM: 2497

DESTRUCTIVE LENGTH CARRY - OVER: 209

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/13/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 209

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P43 | P52 | NEOS | SEOS | 1740 | JC | 4.5 | 850 | 22 | 231 | — | LF | | 6/14 | BM |
| 2 | P43 | P54 | NEOS | SEOS | 1743 | " | " | " | 22 | 253 | — | LF | | 6/14 | BM |
| 3 | P43 | P55 | NEOS | SEOS | 1746 | " | " | " | 22 | 275 | — | LF | | 6/14 | BM |
| 4 | P43 | P58 | NEOS | SEOS | 1749 | " | " | " | 22 | 297 | — | LF | | 6/14 | BM |
| 5 | P43 | P59 | NEOS | SEOS | 1752 | " | " | " | 22 | 319 | — | LF | | 6/14 | BM |
| 6 | P43 | P60 | NEOS | SEOS | 1755 | " | " | " | 22 | 341 | — | LF | | 6/14 | BM |
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DAILY TOTAL FOR WELDED SEAM: 132

DESTRUCTIVE LENGTH CARRY - OVER: 341

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/13/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 323

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P35 | P36 | WEDS | EEDS | 0659 | EB | 5.0 | 850 | 22 | 345 | — | LF | | 6/13 | BM |
| 2 | P35 | P37 | NEDS | SEDS | 0754 | " | 6.0 | " | 406 | ~~480~~ 271 | DS-20 | LF | | 6/13 | BM |
| 3 | P36 | P38 | NEDS | SEDS | 0846 | " | " | " | 36 | 307 | — | LF | | 6/13 | BM |
| 4 | P39 | P40 | WEDS | EEDS | 0855 | " | 5.0 | " | 22 | 329 | — | LF | | 6/13 | BM |
| 5 | P41 | P42 | WEDS | EEDS | 0905 | " | " | " | 22 | 351 | — | LF | | 6/13 | BM |
| 6 | P39 | P41 | NEDS | SEDS | 0915 | " | 6.0 | " | 406 | ~~480~~ 277 | DS-22 | LF | | 6/13 | BM |
| 7 | P40 | P42 | NEDS | SEDS | 1007 | " | " | " | 38 | 315 | — | LF | | 6/13 | BM |
| 8 | P43 | P44 | WEDS | EEDS | 1019 | " | 5.0 | " | 22 | 337 | — | LF | | 6/13 | BM |
| 9 | P47 | P48 | NEDS | SEDS | 1319 | " | " | " | 22 | 359 | — | LF | | 6/14 | BM |
| 10 | P46 | P49 | NEDS | SEDS | 1330 | " | " | " | 13 | 372 | — | LF | | 6/14 | BM |
| 11 | P45 | P49 | EEDS | WEDS | 1332 | " | 6.0 | " | 73 | 445 | — | LF | | 6/14 | BM |
| 12 | P45 | P46 | EEDS | WEDS | 1349 | " | " | " | 91 | ~~480~~ 56 | DS-24 | LF | | 6/14 | BM |
| 13 | P48 | P51 | EEDS | WEDS | 1422 | " | " | " | 115 | 171 | — | LF | | 6/14 | BM |
| 14 | P47 | P51 | EEDS | WEDS | 1437 | " | " | " | 138 | 309 | — | LF | | 6/14 | BM |
| 15 | P53 | P54 | EEDS | WEDS | 1510 | " | " | " | 94 | 403 | — | LF | | 6/14 | BM |
| 16 | P52 | P54 | EEDS | WEDS | 1522 | " | " | " | 150 | ~~480~~ 73 | DS-26 | LF | | 6/14 | BM |
| 17 | P56 | P57 | EEDS | WEDS | 1606 | " | " | " | 179 | 252 | — | LF | | 6/14 | BM |
| 18 | P55 | P57 | EEDS | WEDS | 1629 | " | " | " | 47 | 299 | — | LF | | 6/14 | BM |
| 19 | P55 | P59 | EEDS | WEDS | 1634 | " | " | " | 8 | 307 | — | LF | | 6/14 | BM |
| 20 | P60 | P61 | NEDS | SEDS | 1644 | " | 5.0 | " | 22 | 329 | — | LF | | 6/16 | LF |
| 21 | P59 | P61 | EEDS | WEDS | 1655 | " | 6.0 | " | 58 | 387 | — | LF | | 6/16 | LF |
| 22 | P59 | P60 | EEDS | WEDS | 1703 | " | " | " | 166 | ~~480~~ 73 | DS-28 | LF | | 6/16 | LF |

DAILY TOTAL FOR WELDED SEAM: 2150

DESTRUCTIVE LENGTH CARRY - OVER: 73

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/13/08

FUSION SEAM:

EXTRUSION SEAM: ✓

REVIEWED BY:

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 438

SHEET NUMBER: 1 - OF 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P 33 | TI | 5' EEOS | EEOS | 0912 | BS | — | ~~400~~ 350 | 5' | 443 | — | BM | | 6-21 | BM |
| 2 | TIE-IN | P35 | WEOS | 3X | 0914 | " | — | " | 7 | 451-458 | — | LF | | 6-21 | BM |
| 3 | TIE IN | P35 | 3X | EEOS | 0920 | " | — | " | 14 | ~~462-469~~ 7 | DX-3 | LF | | 6-21 | BM |
| 4 | TIE IN | P37 | WEOS | 5D | 1053 | " | — | " | 7 | 23-30 | — | LF | | 6-21 | BM |
| 5 | TIE IN | P37 | 5D | EEOS | 1058 | " | — | " | 14 | 38-52 | — | LF | | 6-21 | BM |
| 6 | TIE IN | P39 | WEOS | 5F | 1239 | " | — | " | 7 | 56-63 | — | LF | | 6-21 | BM |
| 7 | TIE IN | P39 | 5F | EEOS | 1243 | " | — | " | 14 | 71-85 | — | LF | | 6-21 | BM |
| 8 | TIE IN | P41 | WEOS | 5H | 1248 | " | — | " | 10 | 89-99 | — | LF | | 6-21 | BM |
| 9 | TIE IN | P41 | 5H | EEOS | 1401 | " | — | " | 11 | 103-114 | — | LF | | 6-21 | BM |
| 10 | TIE IN | P43 | WEOS | 5J | 1408 | " | — | " | 11 | 118-129 | — | LF | | 6-21 | BM |
| 11 | TIE IN | P43 | 5J | EEOS | 1414 | " | — | " | 10 | 137-147 | — | LF | | 6-21 | BM |
| 12 | TIE IN | P45 | WEOS | 7B | 1544 | " | — | " | 7 | 154 | — | LF | | 6-21 | BM |
| 13 | TIE IN | P45 | 7B | 7C | 1550 | " | — | " | 22 | 162-184 | — | LF | | 6-21 | BM |
| 14 | TIE IN | P45 | 7C | 7D | 1558 | " | — | " | 22 | 192-214 | — | LF | | 6-21 | BM |
| 15 | TIE IN | P45 | 7D | 7E | 1611 | " | — | " | 22 | 218-240 | — | LF | | 6-21 | BM |
| 16 | TIE IN | P45 | 7E | 7G | 1637 | " | — | " | 22 | 248-270 | — | LF | | 6-21 | BM |
| 17 | TIE IN | P45 | 7G | EEOS | 1658 | " | — | " | 8 | 274-282 | — | LF | | 6-21 | BM |
| 18 | TIE IN | P46 | WEOS | 7I | 1708 | " | — | " | 15 | 286-301 | — | LF | | 6-21 | BM |
| 19 | TIE IN | P46 | 7I | 7J | 1725 | " | — | " | 22 | 305-327 | — | LF | | 6-21 | BM |
| 20 | TIE IN | P46 | 7J | 7K | 1735 | " | — | " | 22 | 331-353 | — | LF | | 6-21 | BM |
| 21 | TIE IN | P46 | 7K | EEOS | 1749 | " | — | " | 22 | 357-379 | — | LF | | 6-21 | BM |
| 22 | TIE IN | P49 | WEOS | 7N | 1800 | " | — | " | 6 | 383-389 | — | LF | | 6-21 | BM |

DAILY TOTAL FOR WELDED SEAM: 300 SEAMING ONLY

DESTRUCTIVE LENGTH CARRY - OVER: 393

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/14/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1209

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 11

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P70 | P71 | WEDS | EEDS | 1033 | ER | 5.0 | 850 | 184 | 195 | — | LF | | 6/14 | BM |
| 2 | P73 | P74 | WEDS | EEDS | 1110 | " | " | " | 169 | 364 | — | LF | | 6/16 | LR |
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DAILY TOTAL FOR WELDED SEAM: 353

DESTRUCTIVE LENGTH CARRY - OVER: 364

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/14/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 341

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P61 | P62 | EEOS | WEOS | 0734 | JC | 5.0 | 850 | 57 | 398 | — | LF | | 6/16 | LF |
| 2 | P60 | P62 | EEOS | WEOS | 0745 | " | " | " | 160 | ~~480~~ 78 | DS-29 | LF | | 6/16 | LF |
| 3 | P65 | P67 | NEOS | SEOS | 0810 | " | 4.5 | " | 22 | 100 | — | LF | | 6/16 | LF |
| 4 | P63 | P64 | EEOS | WEOS | 0825 | " | 5.0 | " | 177 | 277 | — | LF | | 6/16 | LF |
| 5 | P64 | P66 | EEOS | WEOS | 0852 | " | " | " | 32 | 309 | — | LF | | 6/16 | LF |
| 6 | P65 | P68 | EEOS | WEOS | 0950 | " | " | " | 154 | 463 | — | LF | | 6/16 | LF |
| 7 | P67 | P68 | EEOS | WEOS | 1010 | " | " | " | 45 | ~~480~~ 28 | DS-31 | LF | | 6/16 | LF |
| 8 | P69 | P70 | WEOS | EEOS | 1020 | " | " | " | 190 | 218 | — | LF | | 6/16 | LF |
| 9 | P72 | P73 | WEOS | EEOS | 1053 | " | " | " | 174 | 392 | — | LF | | 6/16 | LF |
| 10 | P43 | P62 | NEOS | SEOS | 1322 | " | 4.5 | " | 22 | 414 | — | LF | | 6/16 | LF |
| 11 | P43 | P66 | NEOS | SEOS | 1325 | " | " | " | 22 | 436 | — | LF | | 6/16 | LF |
| 12 | P43 | P64 | NEOS | SEOS | 1328 | " | " | " | 22 | 458 | — | LF | | 6/16 | LF |
| 13 | P43 | P67 | NEOS | SEOS | 1331 | " | " | " | 22 | 480 | — | LF | | 6/16 | LF |
| 14 | P43 | P68 | NEOS | SEOS | 1334 | " | " | " | 17 | ~~490~~ 7 | DS-32 | LF | | 6/16 | LF |
| 15 | P43 | P69 | NEOS | SEOS | 1337 | " | " | " | 22 | 29 | — | LF | | 6/16 | LF |
| 16 | P43 | P70 | NEOS | SEOS | 1340 | " | " | " | 22 | 51 | — | LF | | 6/16 | LF |
| 17 | P43 | P71 | NEOS | SEOS | 1343 | " | " | " | 22 | 73 | — | LF | | 6/16 | LF |
| 18 | P43 | P72 | NEOS | SEOS | 1346 | " | " | " | 22 | 95 | — | LF | | 6/16 | LF |
| 19 | P43 | P73 | NEOS | SEOS | 1349 | " | " | " | 22 | 117 | — | LF | | 6/16 | LF |
| 20 | P44 | P74 | NEOS | SEOS | 1352 | " | " | " | 22 | 139 | — | LF | | 6/16 | BM |
| 21 | P44 | P75 | NEOS | SEOS | 1355 | " | " | " | 10 | 149 | — | LF | | 6/16 | BM |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 1258

DESTRUCTIVE LENGTH CARRY - OVER: 149

ATLANTIC COAS[illegible] [illegible]ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/14/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 73

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P62 | P63 | EEOS | WEOS | 0740 | EB | 6.0 | 850 | 180 | 253 | — | LF | | 6/16 | LF |
| 2 | P63 | P66 | NEOS | SEOS | 0808 | " | 5.0 | " | 22 | 275 | — | LF | | 6/16 | LF |
| 3 | P62 | P66 | EEOS | WEOS | 0814 | " | 6.0 | " | 35 | 310 | — | LF | | 6/16 | LF |
| 4 | P64 | P65 | EEOS | WEOS | 0833 | " | " | " | 155 | 465 | — | LF | | 6/16 | LF |
| 5 | P64 | P67 | EEOS | WEOS | 0853 | " | " | " | 49 | 480 / 34 | DS-30 | LF | | 6/16 | LF |
| 6 | P68 | P69 | EEOS | WEOS | 1007 | " | 5.0 | " | 194 | 228 | — | LF | | 6/14 | BM |
| 7 | P71 | P72 | EEOS | WEOS | 1050 | " | 6.0 | " | 179 | 407 | — | LF | | 6/16 | LF |
| 8 | P75 | P76 | NEOS | SEOS | 1132 | " | 5.0 | " | 5 | 412 | — | LF | | 6/16 | LF |
| 9 | P74 | P75 | WEOS | EEOS | 1137 | " | 6.0 | " | 36 | 448 | — | LF | | 6/16 | LF |
| 10 | P74 | P76 | WEOS | EEOS | | " | " | " | 39 | 487 | — | LF | | 6/16 | LF |
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DAILY TOTAL FOR WELDED SEAM: 894

DESTRUCTIVE LENGTH CARRY - OVER: 487

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/14/08

FUSION SEAM:

EXTRUSION SEAM: ✓

MACHINE NUMBER: 513

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 393

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | TIE-IN | P49 | 7N | EEOS | 0715 | BS | — | ~~459~~ 550 | 18 | 411 | — | LF | | 6-21 | BM |
| 2 | TIE IN | P50 | WEOS | EEOS | 0750 | " | " | " | 53 | ~~454~~ 10 | DX-4 | LF | | 6-21 | BM |
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DAILY TOTAL FOR WELDED SEAM: 71 SEAMING ONLY

DESTRUCTIVE LENGTH CARRY - OVER: 138

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/16/08

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1209

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 364

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P81 | P83 | WEOS | EEOS | 0930 | MB | 5.0 | 850 | 22 | 386 | — | LF | | 6/16 | BM |
| 2 | P82 | P84 | WEOS | EEOS | 0936 | " | " | " | 22 | 408 | — | LF | | 6/17 | BM |
| 3 | P85 | P86 | WEOS | EEOS | 1004 | " | " | " | 22 | 430 | — | LF | | 6/17 | BM |
| 4 | P84 | P86 | SEOS | NEOS | 1015 | " | " | " | 39 | 469 | — | LF | | 6/17 | BM |
| 5 | P82 | P85 | SEOS | NEOS | 1022 | " | " | " | 412 | ~~480~~ 401 | DS-37 | LF | | 6/17 | BM |
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DAILY TOTAL FOR WELDED SEAM: 517

DESTRUCTIVE LENGTH CARRY - OVER: 401

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/16/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 487

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P78 | P80 | WEOS | EEOS | 0809 | EB | 5.0 | 850 | 22 | ~~498~~ 11 | DS-33 | LF | | 6/16 | BM |
| 2 | P79 | P80 | SEOS | NEOS | 0820 | " | 6.0 | " | 39 | 50 | — | LF | | 6/16 | BM |
| 3 | P77 | P78 | SEOS | NEOS | 0825 | " | " | " | 410 | 460 | — | LF | | 6/16 | BM |
| 4 | P83 | P84 | SEOS | NEOS | 0942 | " | " | " | 39 | ~~480~~ 19 | DS-36 | LF | | 6/16 | BM |
| 5 | P81 | P82 | SEOS | NEOS | 0946 | " | " | " | 412 | 431 | — | LF | | 6/16 | BM |
| 6 | P87 | P89 | WEOS | EEOS | 1321 | " | 5.0 | " | 22 | 453 | — | LF | | 6-19 | BM |
| 7 | P88 | P91 | WEOS | EEOS | 1329 | " | " | " | 22 | 475 | — | LF | | 6-19 | BM |
| 8 | P90 | P91 | SEOS | NEOS | 1339 | " | 6.0 | " | 7 | 482 | — | LF | | 6-19 | BM |
| 9 | P89 | P91 | SEOS | NEOS | 1340 | " | " | " | 26 | ~~490~~ 18 | DS-39 | LF | | 6/18 | BM |
| 10 | P87 | P91 | SEOS | NEOS | 1343 | " | " | " | 3 | 21 | — | LF | | 6/18 | BM |
| 11 | P87 | P88 | SEOS | NEOS | 1344 | " | " | " | 407 | 428 | — | LF | | 6/18 | BM |
| 12 | P93 | P95 | WEOS | EEOS | 1509 | " | 5.0 | " | 22 | 450 | — | LF | | 6-19 | BM |
| 13 | P94 | P95 | SEOS | NEOS | 1517 | " | 6.0 | " | 34 | 484 | — | LF | | 6/18 | BM |
| 14 | P92 | P93 | SEOS | NEOS | 1521 | " | " | " | 409 | ~~495~~ 398 | DS-41 | LF | | 6/18 | BM |
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DAILY TOTAL FOR WELDED SEAM: 1874

DESTRUCTIVE LENGTH CARRY - OVER: 398

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/16/08

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1208

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 149

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P77 | P79 | WEOS | EEOS | 0805 | IC | 4.5 | 850 | 22 | 171 | — | LF | | 6/16 | BM |
| 2 | P3 | P79 | SEOS | NEOS | 0817 | " | 5.0 | " | 39 | 210 | — | LF | | 6/16 | BM |
| 3 | P1 | P77 | SEOS | NEOS | 0824 | " | " | " | 411 | 480 141 | DS-34 | LF | | 6-16 | BM |
| 4 | P80 | P83 | SEOS | NEOS | 0932 | " | " | " | 39 | 180 | — | LF | | 6/16 | BM |
| 5 | P78 | P81 | SEOS | NEOS | 0937 | " | " | " | 412 | 480 112 | DS-35 | LF | | 6/16 | BM |
| 6 | P89 | P90 | WEOS | EEOS | 1328 | " | 4.5 | " | 22 | 134 | — | LF | | 6-18 | BM |
| 7 | P86 | P90 | SEOS | NEOS | 1336 | " | 5.0 | " | 8 | 142 | — | LF | | 6-17 | BM |
| 8 | P86 | P89 | SEOS | NEOS | 1338 | " | " | " | 26 | 168 | — | LF | | 6/17 | BM |
| 9 | P86 | P87 | SEOS | NEOS | 1340 | " | " | " | 5 | 173 | — | LF | | 6/17 | BM |
| 10 | P85 | P87 | SEOS | NEOS | 1341 | " | " | " | 407 | 480 100 | DS-38 | LF | | 6/17 | BM |
| 11 | P92 | P94 | WEOS | EEOS | 1456 | " | 4.5 | " | 22 | 122 | — | LF | | 6-18 | TS |
| 12 | P91 | P94 | SEOS | NEOS | 1504 | " | 5.0 | " | 33 | 155 | — | LF | | 6/18 | BM |
| 13 | P91 | P92 | SEOS | NEOS | 1510 | " | " | " | 3 | 158 | — | LF | | 6/18 | BM |
| 14 | P88 | P92 | SEOS | NEOS | 1511 | " | " | " | 409 | 480 87 | DS-40 | LF | | 6/18 | BM |
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DAILY TOTAL FOR WELDED SEAM: 1858

DESTRUCTIVE LENGTH CARRY - OVER: 87

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/17/08

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1209

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 401

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P100 | P101 | WEOS | EEOS | 0851 | MB | 5.5 | 850 | 22 | 423 | — | LF | | 6-19 | BM |
| 2 | P102 | P103 | WEOS | EEOS | 0902 | " | " | " | 22 | 445 | — | LF | | 6-19 | BM |
| 3 | P104 | P106 | WEOS | EEOS | 1028 | " | " | " | 22 | 467 | — | LF | | 6-19 | BM |
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DAILY TOTAL FOR WELDED SEAM: 66

DESTRUCTIVE LENGTH CARRY - OVER: 467

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/17/03

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1210

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 398

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P97 | P99 | WEOS | EEOS | 0740 | EB | 5.0 | 850 | 22 | 420 | — | LF | | 6-19 | BM |
| 2 | P98 | P99 | SEOS | NEOS | 0754 | " | 6.0 | " | 42 | 462 | — | LF | | 6-19 | BM |
| 3 | P96 | P97 | SEOS | NEOS | 0759 | " | " | " | 406 | 480 / 388 | DS-43 | LF | | 6-19 | BM |
| 4 | P101 | P103 | SEOS | NEOS | 0910 | " | " | " | 41 | 429 | — | LF | | 6-19 | BM |
| 5 | P100 | P102 | SEOS | NEOS | 0915 | " | " | " | 404 | 480 / 353 | DS-45 | LF | | 6-19 | BM |
| 6 | P105 | P107 | WEOS | EEOS | 1028 | " | 5.0 | " | 22 | 375 | — | LF | | 6-19 | BM |
| 7 | P106 | P107 | SEOS | NEOS | 1037 | " | 6.0 | " | 39 | 414 | — | LF | | 6-19 | BM |
| 8 | P104 | P105 | SEOS | NEOS | 1042 | " | " | " | 411 | 480 / 345 | DS-46 | LF | | 6-19 | BM |
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DAILY TOTAL FOR WELDED SEAM: 1387

DESTRUCTIVE LENGTH CARRY - OVER: 345

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/17/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 87

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P96 | P98 | WEOS | EEOS | 0737 | JC | 4.5 | 850 | 22 | 109 | — | LF | | 6-19 | BM |
| 2 | P95 | P98 | SEOS | NEOS | 0743 | " | 5.5 | " | 36 | 145 | — | LF | | 6-19 | BM |
| 3 | P93 | P96 | SEOS | NEOS | 0750 | " | " | " | 403 | 480 / 68 | DS-42 | LF | | 6-19 | BM |
| 4 | P99 | P101 | SEOS | NEOS | 0848 | " | " | " | 41 | 109 | — | LF | | 6-19 | BM |
| 5 | P97 | P100 | SEOS | NEOS | 0854 | " | " | " | 405 | 480 / 34 | DS-44 | LF | | 6-19 | BM |
| 6 | P103 | P106 | SEOS | NEOS | 1030 | " | " | " | 41 | 75 | — | LF | | 6-19 | BM |
| 7 | P102 | P104 | SEOS | NEOS | 1035 | " | " | " | 408 | 483 | — | LF | | 6-19 | BM |
| 8 | P108 | P109 | WEOS | EEOS | 1256 | " | 4.5 | " | 22 | 494 / 11 | DS-47 | LF | | 6-19 | BM |
| 9 | P107 | P109 | SEOS | NEOS | 1303 | " | 5.5 | " | 39 | 50 | — | LF | | 6-19 | BM |
| 10 | P105 | P108 | SEOS | NEOS | 1310 | " | " | " | 410 | 460 | — | LF | | 6-19 | BM |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 1827

DESTRUCTIVE LENGTH CARRY - OVER: 460

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/18/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 120

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 345

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH. | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P112 | P113 | SEOS | NEOS | 0757 | EB | 5.0 | 850 | 22 | 367 | — | LF | | 6-20 | BM |
| 2 | P111 | P112 | EEOS | WEOS | 0809 | " | 6.0 | " | 106 | 473 | — | LF | | 6-20 | BM |
| 3 | P111 | P113 | EEOS | WEOS | 0823 | " | " | " | 173 | 490 / 156 | DS-49 | LF | | 6-19 | BM |
| 4 | P109 | P117 | SEOS | NEOS | 0935 | " | " | " | 41 | 197 | — | LF | | 6-19 | BM |
| 5 | P108 | P117 | SEOS | NEOS | 0940 | " | " | " | 339 | 480 / 56 | DS-50 | LF | | 6-19 | BM |
| 6 | P118 | P119 | SEOS | NEOS | 1033 | " | " | " | 379 | 435 | — | LF | | 6-19 | BM |
| 7 | P120 | P121 | EEOS | WEOS | 1321 | " | " | " | 54 | 480 / 9 | DS-52 | LF | | 6-19 | BM |
| 8 | P122 | P123 | EEOS | WEOS | 1333 | " | " | " | 55 | 64 | — | LF | | 6-19 | BM |
| 9 | P125 | P126 | EEOS | WEOS | 1347 | " | " | " | 65 | 129 | — | LF | | 6-19 | BM |
| 10 | P126 | P127 | EEOS | WEOS | 1402 | " | " | " | 63 | 192 | — | LF | | 6-19 | BM |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 1297

DESTRUCTIVE LENGTH CARRY - OVER: 192

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/18/08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1208

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 460

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P110 | P111 | EEOS | WEOS | 0736 | JC | 5.5 | 850 | 293 | ~~480~~ 273 | DS-48 | LF | | 6-19 | BM |
| 2 | P115 | P116 | EEOS | WEOS | 0815 | " | " | " | 46 | 319 | — | LF | | 6-19 | BM |
| 3 | P114 | P115 | EEOS | WEOS | 0823 | " | " | " | 49 | 368 | — | LF | | 6-19 | BM |
| 4 | P113 | P114 | 7'-S EOS | NEOS | 0902 | " | 4.5 | " | 7 | 375 | — | LF | | 6-19 | BM |
| 5 | P111 | P115 | SEOS | NEOS | 0905 | " | " | " | 24 | 399 | — | LF | | 6-19 | BM |
| 6 | P110 | P116 | EEOS | WEOS | 0907 | " | " | " | 47 | 446 | — | LF | | 6-19 | BM |
| 7 | P117 | P118 | SEOS | NEOS | 0946 | " | 5.5 | " | 381 | ~~480~~ 347 | DS-51 | LF | | 6-19 | BM |
| 8 | P108 | P112 | SEOS | NEOS | 1050 | " | 4.5 | " | 22 | 369 | — | LF | | 6-20 | BM |
| 9 | P108 | P111 | SEOS | NEOS | 1054 | " | " | " | 22 | 391 | — | LF | | 6-20 | BM |
| 10 | P108 | P110 | SEOS | NEOS | 1058 | " | " | " | 22 | 413 | — | LF | | 6-20 | BM |
| 11 | P114 | P120 | EEOS | WEOS | 1316 | " | 5.5 | " | 51 | 464 | — | LF | | 6-19 | BM |
| 12 | P121 | P122 | EEOS | WEOS | 1326 | " | " | " | 56 | ~~480~~ 40 | DS-53 | LF | | 6-19 | BM |
| 13 | P124 | P125 | EEOS | WEOS | 1346 | " | " | " | 69 | 109 | — | LF | | 6-19 | BM |
| 14 | P123 | P128 | WEOS | EEOS | 1400 | " | 4.5 | " | 19 | 128 | — | LF | | 6-20 | BM |
| 15 | P123 | P127 | EEOS | WEOS | 1412 | " | " | " | 44 | 172 | — | LF | | 6-19 | BM |
| 16 | P127 | P128 | EEOS | WEOS | 1420 | " | " | " | 18 | 190 | — | LF | | 6-20 | BM |
| 17 | P112 | P117 | EEOS | WEOS | 1430 | " | " | " | 22 | 212 | — | LF | | 6-20 | BM |
| 18 | P112 | P118 | EEOS | WEOS | 1438 | " | " | " | 22 | 234 | — | LF | | 6-20 | BM |
| 19 | P112 | P119 | EEOS | WEOS | 1440 | " | " | " | 22 | 256 | — | LF | | 6-20 | BM |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 1236

DESTRUCTIVE LENGTH CARRY - OVER: 256

ATLANTIC COAST NSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6/18/08

FUSION SEAM:

EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 88

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | TIE-IN | P97 | WEOS | 11H | 0708 | BS | — | 400/500 | 17 | 92-109 | — | LF | | 6-21 | BM |
| 2 | TIE IN | P97 | 11H | EEOS | 0718 | " | " | " | 4 | 115-119 | — | LF | | 6-21 | BM |
| 3 | TIE IN | P96 | WEOS | 11J | 0738 | " | " | " | 17 | 127-144 | — | LF | | 6-21 | BM |
| 4 | TIE IN | P96 | 11J | EEOS | 0745 | " | " | " | 4 | 152-156 | — | LF | | 6-21 | BM |
| 5 | TIE IN | P93 | WEOS | 11M | 0747 | " | " | " | 18 | 160-178 | — | LF | | 6-21 | BM |
| 6 | TIE IN | P93 | 11M | EEOS | 1342 | ER | " | 550/550 | 3 | 182-185 | — | LF | | 6-21 | BM |
| 7 | TIE IN | P92 | WEOS | 11P | 1343 | " | " | " | 18 | 189-207 | — | LF | | 6-21 | BM |
| 8 | TIE IN | P92 | 11P | EEOS | 1412 | " | " | " | 3 | 211-214 | — | LF | | 6-21 | BM |
| 9 | TIE IN | P88 | WEOS | EEOS | 1416 | " | " | " | 21 | 218-239 | — | LF | | 6-21 | BM |
| 10 | TIE IN | P87 | WEOS | EEOS | 1427 | " | " | " | 21 | 253-274 | — | LF | | 6-21 | BM |
| 11 | TIE IN | P85 | WEOS | EEOS | 1440 | " | " | " | 21 | 286-307 | — | LF | | 6-21 | BM |
| 12 | TIE IN | P82 | WEOS | EEOS | 1452 | " | " | " | 21 | 317-338 | — | LF | | 6-21 | BM |
| 13 | TIE IN | P81 | WEOS | EEOS | 1502 | " | " | " | 21 | 347-368 | — | LF | | 6-21 | BM |
| 14 | TIE IN | P78 | WEOS | EEOS | 1518 | " | " | " | 21 | 376-397 | — | LF | | 6-21 | BM |
| 15 | TIE IN | P77 | WEOS | EEOS | 1525 | " | " | " | 21 | 403-424 | — | LF | | 6-21 | BM |
| 16 | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 231 SEAMING ONLY

DESTRUCTIVE LENGTH CARRY - OVER: 438

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6-19-08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1209

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 467

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P-129 | P-131 | SEOS | NEOS | 0729 | EB | 850 | 54.5 | 22 | 489/0 | DS-54 | TS | | 6-19 | BM |
| 2 | P-130 | P-131 | EEOS | WEOS | 0737 | " | " | " | 7 | 7 | | TS | | 6-19 | BM |
| 3 | P-129 | P-130 | EEOS | WEOS | 0738 | " | " | " | 187 | 194 | | TS | | 6-19 | BM |
| 4 | P-130 | P-132 | EEOS | WEOS | 0805 | " | " | " | 185 | 379 | | TS | | 6-19 | BM |
| 5 | P-135 | P-136 | EEOS | WEOS | 0937 | " | " | " | 16 | 395 | | TS | | 6-19 | BM |
| 6 | P-134 | P-135 | EEOS | WEOS | 0952 | " | " | " | 30 | 425 | | TS | | 6-19 | BM |
| 7 | P-134 | P-136 | EEOS | WEOS | 0956 | " | " | " | 8 | 433 | | TS | | 6-19 | BM |
| 8 | P-124 | P-134 | EEOS | WEOS | 0958 | " | " | " | 72 | 490/15 | DS-56 | TS | | 6-19 | BM |
| 9 | P-123 | P-132 | NEOS | SEOS | 1116 | " | " | " | 7 | 22 | | TS | | 6-19 | BM |
| 10 | P-127 | P-132 | NEOS | SEOS | 1117 | " | " | " | 10 | 32 | | TS | | 6-19 | BM |
| 11 | P-127 | P-133 | NEOS | SEOS | 1119 | " | " | " | 12 | 44 | | TS | | 6-19 | BM |
| 12 | P-126 | P-133 | NEOS | SEOS | 1121 | " | " | " | 22 | 66 | | TS | | 6-19 | BM |
| 13 | P-125 | P-135 | NEOS | SEOS | 1124 | " | " | " | 21 | 87 | | TS | | 6-19 | BM |
| 14 | P-124 | P-135 | NEOS | SEOS | 1128 | " | " | " | 14 | 101 | | TS | | 6-19 | BM |
| 15 | P-124 | P-136 | NEOS | SEOS | 1130 | " | " | " | 6 | 107 | | TS | | 6-19 | BM |
| 16 | P-140 | P-141 | WEOS | EEOS | 1307 | " | " | " | 22 | 129 | | TS | | 6-20 | BM |
| 17 | P-141 | P-142 | WEOS | EEOS | 1314 | " | " | " | 22 | 151 | | TS | | 6-20 | BM |
| 18 | P-139 | P-142 | SEOS | NEOS | 1322 | " | " | " | 26 | 177 | | TS | | 6-20 | BM |
| 19 | P-139 | P-141 | SEOS | NEOS | 1325 | " | " | " | 76 | 253 | | TS | | 6-20 | BM |
| 20 | P 139 | P-140 | SEOS | NEOS | 1334 | " | " | " | 141 | 394 | | TS | | 6-20 | BM |
| 21 | P 146 | P-147 | WEOS | EEOS | 1358 | " | " | " | 56 | 450 | | TS | | 6-20 | BM |
| 22 | P-147 | P-148 | WEOS | EEOS | 1407 | " | " | " | 58 | 490/18 | DS-59 | TS | | 6-20 | BM |

DAILY TOTAL FOR WELDED SEAM: 1020

DESTRUCTIVE LENGTH CARRY - OVER: 18

ATLANTIC COAST [illegible]NSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6-19-08

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1209

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 18

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P-150 | P-151 | WEOS | EEOS | 1420 | EB | 5.0 | 850 | 47 | 65 | | TS | | 6-20 | BM |
| 2 | P-151 | P-152 | WEOS | EEOS | 1430 | " | " | " | 21 | 86 | | TS | | 6-20 | BM |
| 3 | P-142 | P-143 | SEOS | NEOS | 1445 | " | " | " | 22 | 108 | | TS | | 6-20 | BM |
| 4 | P-142 | P-144 | SEOS | NEOS | 1448 | " | " | " | 4 | 112 | | TS | | 6-20 | BM |
| 5 | P-141 | P-144 | SEOS | NEOS | 1449 | " | " | " | 18 | 130 | | TS | | 6-20 | BM |
| 6 | P-141 | P-145 | SEOS | NEOS | 1452 | " | " | " | 22 | 152 | | TS | | 6-20 | BM |
| 7 | P-141 | P-146 | SEOS | NEOS | 1455 | " | " | " | 22 | 174 | | TS | | 6-20 | BM |
| 8 | P-141 | P-147 | SEOS | NEOS | 1458 | " | " | " | 12 | 186 | | TS | | 6-20 | BM |
| 9 | P-140 | P-147 | SEOS | NEOS | 1500 | " | " | " | 10 | 196 | | TS | | 6-20 | BM |
| 10 | P-140 | P-148 | SEOS | NEOS | 1502 | " | " | " | 22 | 218 | | TS | | 6-20 | BM |
| 11 | P-140 | P-149 | SEOS | NEOS | 1505 | " | " | " | 22 | 240 | | TS | | 6-20 | BM |
| 12 | P-140 | P-150 | SEOS | NEOS | 1508 | " | " | " | 22 | 262 | | TS | | 6-20 | BM |
| 13 | P-140 | P-151 | SEOS | NEOS | 1511 | " | " | " | 22 | 284 | | TS | | 6-20 | BM |
| 14 | P-140 | P-152 | SEOS | NEOS | 1514 | " | " | " | 14 | 298 | | TS | | 6-19 | BM |
| 15 | P-138 | P-150 | WEOS | EEOS | 1526 | " | " | " | 32 | 330 | | TS | | 6-20 | BM |
| 16 | P-138 | P-151 | WEOS | EEOS | 1531 | " | " | " | 37 | 367 | | TS | | 6-20 | BM |
| 17 | P-138 | P-152 | WEOS | EEOS | 1536 | " | " | " | 23 | 390 | | TS | | 6-19 | BM |
| 18 | P-138 | P-140 | WEOS | EEOS | 1541 | " | " | " | 32 | 422 | | TS | | 6-19 | BM |
| 19 | P-138 | P-139 | WEOS | EEOS | 1549 | " | " | " | 32 | 454/0 | DS-61 | TS | | 6-20 | BM |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 436

DESTRUCTIVE LENGTH CARRY - OVER: Ø

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6-19-08

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1208

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 256

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P-112 | P-131 | EEOS | WEOS | 0733 | JC | 5.5 | 850 | 6 | 262 | | TS | | 6-19 | BM |
| 2 | P-112 | P-129 | EEOS | WEOS | 0734 | " | " | " | 33 | 295 | | TS | | 6-19 | BM |
| 3 | P-113 | P-129 | EEOS | WEOS | 0740 | " | " | " | 162 | 457 | | TS | | 6-19 | BM |
| 4 | P-132 | P-133 | EEOS | WEOS | 0805 | " | " | " | 167 | 490/134 | DS-55 | TS | | 6-19 | BM |
| 5 | P-133 | P-135 | EEOS | WEOS | 0934 | " | " | " | 62 | 196 | | TS | | 6-19 | BM |
| 6 | P-134 | P-137 | EEOS | WEOS | 0951 | " | " | " | 140 | 336 | | TS | | 6-19 | BM |
| 7 | P-137 | P-138 | WEOS | EEOS | 1014 | " | " | " | 164 | 496/4 | DS-57 | TS | | 6-19 | BM |
| 8 | P-133 | P-138 | EEOS | WEOS | 1040 | " | " | " | 7 | 11 | | TS | | 6-19 | BM |
| 9 | P-133 | P-137 | EEOS | WEOS | 1041 | " | " | " | 31 | 42 | | TS | | 6-19 | BM |
| 10 | P-133 | P-134 | EEOS | WEOS | 1053 | " | " | " | 30 | 72 | | TS | | 6-19 | BM |
| 11 | P-113 | P114 | 7'-SEOS | SEOS | 1105 | " | " | " | 13 | 85 | | TS | | 6-19 | BM |
| 12 | P-113 | P-120 | NEOS | SEOS | 1110 | " | " | " | 4 | 89 | | TS | | 6-19 | BM |
| 13 | P-120 | P 129 | NEOS | SEOS | 1111 | " | " | " | 19 | 108 | | TS | | 6-19 | BM |
| 14 | P-121 | P-129 | NEOS | SEOS | 1115 | " | " | " | 5 | 113 | | TS | | 6-19 | BM |
| 15 | P-121 | P-130 | NEOS | SEOS | 1116 | " | " | " | 16 | 129 | | TS | | 6-19 | BM |
| 16 | P-122 | P-130 | NEOS | SEOS | 1118 | " | " | " | 7 | 136 | | TS | | 6-19 | BM |
| 17 | P-122 | P-132 | NEOS | SEOS | 1120 | " | " | " | 14 | 150 | | TS | | 6-19 | BM |
| 18 | P-119 | P-139 | SEOS | NEOS | 1256 | " | " | " | 264 | 414 | | TS | | 6-20 | BM |
| 19 | P-143 | P-144 | WEOS | EEOS | 1330 | " | " | " | 55 | 469 | | TS | | 6-20 | BM |
| 20 | P-144 | P-145 | WEOS | EEOS | 1345 | " | " | " | 56 | 490/35 | DS-58 | TS | | 6-20 | BM |
| 21 | P-145 | P-146 | WEOS | EEOS | 1357 | " | " | " | 56 | 91 | | TS | | 6-20 | BM |
| 22 | P 148 | P-149 | WEOS | EEOS | 1405 | " | " | " | 60 | 151 | | TS | | 6-20 | BM |
| | | | | | | | | DAILY TOTAL FOR WELDED SEAM: | 1371 | | | | | | |
| | | | | | | | | DESTRUCTIVE LENGTH CARRY - OVER: | | 151 | | | | | |

ATLANTIC COAS ONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6-19-08

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY: [illegible]

MACHINE NUMBER: 1208

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 151

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P149 | P-150 | WEOS | EEOS | 1417 | JC | 5.5 | 850 | 67 | 218 | | TS | | 6-20 | BM |
| 2 | P-119 | P-138 | SEOS | NEOS | 1504 | " | " | " | 22 | 240 | | TS | | 6-20 | BM |
| 3 | P-119 | P-133 | SEOS | NEOS | 1507 | " | " | " | 22 | 262 | | TS | | 6-20 | BM |
| 4 | P-119 | P-132 | SEOS | NEOS | 1510 | " | " | " | 22 | 284 | | TS | | 6-20 | BM |
| 5 | P-119 | P-130 | SEOS | NEOS | 1513 | " | " | " | 22 | 306 | | TS | | 6-20 | BM |
| 6 | P119 | P-131 | SEOS | NEOS | 1516 | " | " | " | 22 | 328/0 | DS-60 | TS | | 6-20 | BM |
| 7 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | |
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| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 177

DESTRUCTIVE LENGTH CARRY - OVER: Ø

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6-20-08

FUSION SEAM:

EXTRUSION SEAM: ✓

REVIEWED BY:

MACHINE NUMBER: 013

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 18 (see repair log)

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER FIRST PANEL | SEAM NUMBER SECOND PANEL | SEAM SECTION START POINT | SEAM SECTION FINISH POINT | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE TEST DATE | NON-DESTRUCTIVE CQA MONITOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P-110 | Tie In | WEOS | EEOS | 1020 | IS | — | 500/550 | 315 | 333 | | TS | | 6/20/08 | BM |
| 2 | P-108 | Tie In | WEOS | EEOS | 1505 | " | " | " | 15 | 389/404 | | TS | | 6-21 | BM |
| 3 | P-105 | Tie In | WEOS | EEOS | 1517 | " | " | " | 19 | 423 | | TS | | 6-21 | BM |
| 4 | P-104 | Tie In | WEOS | EEOS | 1517 | " | " | " | 19 | 442 | | TS | | 6-21 | BM |
| 5 | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | |
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| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
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| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 368

DESTRUCTIVE LENGTH CARRY - OVER: 442

Seaming and Repair Log

ATLANTIC COAST NSULTING, INC

# GEOMEMBRANE SEAM LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 6-21-08

FUSION SEAM:

EXTRUSION SEAM: ✓

MACHINE NUMBER: 013

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 442

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | APPROX. START TIME | WELDING TECH | MACHINE SPEED | MACHINE TEMP. | APPROX. LENGTH WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUCTIVE NUMBER | CQA MONITOR INITIALS | REMARKS | NON-DESTRUCTIVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | | | | | | | | TEST DATE | CQA MONITOR |
| 1 | P-102 | Tie In | WEDS | EEDS | 0703 | IS | — | 500/550 | 20 | 462 | | TS | | 6-21 | BM |
| 2 | P-100 | Tie In | WEDS | EEDS | 0724 | " | — | " | 20 | 482 | | TS | | 6-21 | BM |
| 3 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | |
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| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 40

DESTRUCTIVE LENGTH CARRY - OVER: 482

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX J
## Defect Logs

# GEOMEMBRANE DEFECT LOG

**PROJECT NUMBER:** A011.102

**PROJECT TITLE:** CMS Landfill V Cell 2G

**PROJECT LOCATION:** Charlotte, North Carolina

**REVIEWED BY:** [illegible]

**SHEET NUMBER:** 1

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P1/2 | 70' S. OF NEOS | DS-1 | 6/10/08 | LF | | 6/11/08 | 6/12/08 |
| B | P2/4 | 11 E. OF NEOS | DS-2 | 6/10/08 | LF | | 6/11/08 | 6/12/08 |
| C | P2/5 | 104' S. OF NEOS | DS-3 | 6/10/08 | LF | | 6/11/08 | 6/12/08 |
| D | P1/2/3/4 | INTERSECTION | T | 6/10/08 | LF | | 6/12/08 | 6/12/08 |
| E | P2/4/6 | " | T | 6/10/08 | LF | | 6/12/08 | 6/12/08 |
| F | P2/5/6 | " | T | 6/10/08 | LF | | 6/12/08 | 6/12/08 |
| G | P5/6/7/8 | " | T | 6/10/08 | LF | | 6/12/08 | 6/12/08 |
| H | P6/8 | 36' S. OF NEOS | DS-4 | 6/10/08 | LF | | 6/11/08 | 6/12/08 |
| I | P7/9 | 115' S. OF NEOS | DS-5 | 6/10/08 | LF | | 6/11/08 | 6/12/08 |
| J | P7/8/9/10 | INTERSECTION | T | 6/10/08 | LF | | 6/12/08 | 6/12/08 |
| K | P9/11 | 255' S. OF NEOS | DS-6 | 6/11/08 | LF | | 6/12/08 | 6/12/08 |
| M | P11/12 | 75' S. OF NEOS | DS-7 | " | LF | | 6/12/08 | 6/12/08 |
| N | P12/15 | 267' S. OF NEOS | DS-8 | " | LF | | 6/12/08 | 6/12/08 |
| P | IC/P2 | W. SIDE OF DS-3 | DX-1 | " | LF | | 6/11/08 | 6/12/08 |
| Q | TIE-IN/P9 | 11' E. OF NEOS | BO | " | LF | | 6/11/08 | 6/12/08 |
| R | TIE-IN/P9/11 | INTERSECTION | T | " | LF | | 6/12/08 | 6/12/08 |
| S | P15/16 | 306' S. OF NEOS | DS-9 | " | LF | | 6/12/08 | 6/12/08 |
| T | TIE-IN/P3/7 | INTERSECTION | T | " | LF | | 6/11/08 | 6/12/08 |
| V | TIE-IN/P1/2 | " | T | " | LF | | 6/11/08 | 6/12/08 |
| W | TIE-IN/P7/9 | " | T | " | LF | | 6/12/08 | 6/12/08 |
| X | TIE-IN/P2/5 | " | T | " | LF | | 6/12/08 | 6/12/08 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 2

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P-12/14/15 | @ Int | T | 6-12 | TS | | 6/12 | 6/12 |
| B | P 11/12/14 | @ Int | T | 6-11 | Bm | | 6/12 | 6/12 |
| C | P 11/13/14 | @ Int | T | 6-11 | Bm | | 6/12 | 6/12 |
| D | P 9/10/11/13 | @ Int | Ts | 6-11 | Bm | | 6/12 | 6/12 |
| E | P 7/8 | 10 Ft. E. of WEOS | BO | 6-11 | BM | | 6/13 | 6/21 |
| F | P 14/15/17 | @ Int | T | 6/11 | Bm | | 6/12 | 6/12 |
| G | P 15/16/17/18 | @ Int | Ts | 6/11 | Bm | | 6/12 | 6/12 |
| H | P/16/18/19 | @ Int | T | 6/11 | Bm | | 6/12 | 6/12 |
| I | P 18/19/21 | @ Int | T | 6/11 | Bm | | 6/12 | 6/12 |
| J | 19/20/21/22 | @ Int | Ts | 6/11 | Bm | | 6/12 | 6/12 |
| K | P. 20/22/23/25 | @ INT | Ts | 6/11 | Bm | | 6/12 | 6/12 |
| M | 23/24/25/26 | @ INT | Ts | 6/11 | BM | | 6/12 | [illegible] |
| N | 24/26/27/28 | @ INT | Ts | 6/11 | Bm | | 6/12 | 6/12 |
| P | 24/TI | 6' E. OF WEOS | FM | 6/12 | Bm | | 6/12 | 6/12 |
| Q | 23/TI | 6' E of WEOS | PT | 6/12 | Bm | | 6/12 | 6/12 |
| R | 20/TI | 5' E of WEOS | PT | 6/12 | Bm | | 6/12 | 6/12 |
| S | 19/TI | 4' E. of WEOS | PT | 6/12 | Bm | | 6/12 | 6/12 |
| T | P-16/TI | 4' E. of WEOS | PT | 6/12 | Bm | | 6/12 | 6/12 |
| V | P-15-TI | 4' E. of WEOS | PT | 6/12 | Bm | | 6/12 | 6/12 |
| W | P-15-TI | 5' W of EEOS | PT | 6/12 | BM | | 6/12 | 6/12 |
| X | P 11-12-TI | 4' E of WEOS | PT | 6/12 | Bm | | 6/12 | 6/12 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 3

| DEFECT CODE | DEFECT LOCATION: SEAM PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | COA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P16/19 | 303' S. OF NEOS | DS-10 | 6/11/08 | LF | | 6/12/08 | 6/12/08 |
| B | P19/20 | 135' S. OF NEOS | DS-11 | " | LF | | 6/12/08 | 6/12/08 |
| C | P20/23 | 227' S. OF NEOS | DS-12 | " | LF | | 6/12/08 | 6/12/08 |
| D | P23/24 | 172' S. OF NEOS | DS-13 | " | LF | | 6/12/08 | 6/12/08 |
| E | P24/27 | 263' S. OF NEOS | DS-14 | " | LF | | 6/12/08 | 6/12/08 |
| F | TIE-IN/P11 | 11' W. OF EEOS | DS-15 | " | LF | | 6/12/08 | 6/12/08 |
| G | P27/29 | 297' S. OF NEOS | DS-16 | 6/12/08 | LF | | 6/13/08 | 6/21 |
| H | TIE-IN/P27/29 | INTERSECTION | T | " | LF | | 6/12/08 | 6/21 |
| I | TIE-IN/P29 | 7' E. OF WEOS | P | " | LF | | 6/12/08 | 6/21 |
| J | P29/31 | 165' S. OF NEOS | DS-17 | " | LF | | 6/13/08 | 6/21 |
| K | P31/33 | 335' S. OF NEOS | DS-18 | " | LF | | 6/13/08 | 6-20 |
| M | TIE-IN/P29/31 | INTERSECTION | T | " | LF | | 6/12/08 | 6/21 |
| N | TIE-IN/P31 | 7' E. OF WEOS | P | " | LF | | 6/12/08 | 6/21 |
| P | TIE-IN/P31/33 | INTERSECTION | P | " | LF | | 6/12/08 | 6/21 |
| Q | TIE-IN/P33 | 7' E. OF WEOS | P | " | LF | | 6/12/08 | 6/21 |
| R | P33/35 | 368' S. OF NEOS | DS-19 | 6/13/08 | LF | | 6/17 | 6-20 |
| S | P35/37 | 135' S. OF NEOS | DS-20 | " | LF | | 6/14 | 6-20 |
| T | P37/39 | 385' S. OF NEOS | DS-21 | " | LF | | 6/17 | 6-20 |
| V | P39/41 | 129' S. OF NEOS | DS-22 | " | LF | | 6/14 | 6-20 |
| W | TIE-IN/P33/35 | INTERSECTION | T | " | LF | | 6/13/08 | 6-21 |
| X | TIE-IN/P35 | 7' E. OF WEOS | P | " | LF | | 6/13/08 | 6-20 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

REVIEWED BY: [signature]

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 4

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P-24/27 | Taken From 3E | DX-2 | 6/12 | BM | | 6/12 | 6/12 |
| B | P-24/27/TI | @ Int. | T | 6/12 | BM | | 6/12 | 6/12 |
| C | P-19/20/TI | @ Int | T | 6/12 | BM | | 6/12 | 6/12 |
| D | P 16/19/TI | @ Int | T | 6/12 | BM | | 6/12 | 6/12 |
| E | 20/23/TI | @ Int | T | 6/12 | BM | | 6/12 | 6/12 |
| F | P15/16/TI | @ Int | T | 6/12 | BM | | 6/12 | 6/12 |
| G | P-11 TI | @ Int | T | 6/12 | BM | | 6/12 | 6/12 |
| H | P27,28,29,30 | @ Intersection | TS | 6/12 | BM | | 6/13 | 6-20 |
| I | 29/30/31/32 | @ Int. | TS | 6/12 | BM | | 6/12 | 6/12 |
| J | 31/32/33/34 | @ Int | TS | 6/13 | BM | | 6/13 | 6-20 |
| K | 33/34/35/36 | @ Int | TS | 6/13 | BM | | 6/17 | 6-20 |
| M | 35/36/37/38 | @ Int | TS | 6/13 | BM | | 6/17 | 6 [illegible] |
| N | 37/38/39/40 | @ Int | TS | 6/13 | BM | Capped by 10X | 6/17 | — |
| P | 39/40/41/42 | @ Int | TS | 6/13 | BM | Capped by 10W | 6/17 | — |
| Q | 41/42/43/44 | @ Int | TS | 6/13 | BM | | 6/17 | 6-20 |
| R | 45/49 | 8'W of EEOG | WS | 6/13 | BM | | 6/17 | 6-20 |
| S | 45/46/47 | @ Intersection | T | 6/13 | BM | | 6/14 | 6-20 |
| T | 47/48/51 | @ Int. | T | 6/13 | BM | | 6/14 | 6-20 |
| V | 53/52/51 | @ Int | T | 6/13 | BM | | 6/14 | 6-20 |
| W | 54/55/56 | @ Int | T | 6/13 | BM | | 6/14 | 6-20 |
| X | 56 | 5' From W/OS 13' From N/OS | D | 6/13 | BM | | 6/14 | 6-20 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE DEFECT LOG

**PROJECT NUMBER:** A011.102

**PROJECT TITLE:** CMS Landfill V Cell 2G

**PROJECT LOCATION:** Charlotte, North Carolina

**REVIEWED BY:** [illegible]

**SHEET NUMBER:** 5

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | TIE-IN/P35/37 | INTERSECTION | T | 6/13/08 | LF | | 6/13/08 | 6-20 |
| B | TIE-IN/P36 | 7' W. OF EEOS | DX-3 | " | LF | | 6/13/08 | 6-20 |
| C | P42/44 | 12' S. OF NEOS | DS-23 | " | LF | Capped by 12M | 6/17 | — |
| D | TIE-IN/P37 | 7' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20. |
| E | TIE-IN/P37/39 | INTERSECTION | T | " | LF | | 6/13/08 | 6-20 |
| F | TIE-IN/P39 | 7' E. OF WEOS | T | " | LF | | 6/13/08 | 6-21 |
| G | TIE-IN/P39/41 | INTERSECTION | T | " | LF | | 6/13/08 | 6-20 |
| H | TIE-IN/P41 | 10' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| I | TIE-IN/P41/43 | INTERSECTION | T | " | LF | | 6/13/08 | 6-20 |
| J | TIE-IN/P43 | 11' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| K | P45/47/48 | INTERSECTION | T | " | LF | | 6/14 | 6-20 |
| M | P45/46 | 35' W. OF EEOS | DS-24 | " | LF | | 6/16 | 6-20 |
| N | P51/52 | 28' W. OF EEOS | DS-25 | " | LF | | 6/16 | 6-20 |
| P | P52/53/54 | INTERSECTION | T | " | LF | | 6/14 | 6-20 |
| Q | P52/54 | 77' W. OF EEOS | DS-26 | " | LF | | 6/16 | 6-20 |
| R | P56 | 13' E. WEOP & 3' E. NEOP | D | " | LF | | 6/14 | 6-20 |
| S | P56 | 20' E. WEOP & 13' E. NEOP | D | " | LF | | 6/14 | 6-20 |
| T | P55/56/57 | INTERSECTION | T | " | LF | | 6/14 | 6-20 |
| V | P55/P57/58 | " | T | " | LF | | 6/16 | 6-20 |
| W | P57/58/59 | " | T | " | LF | | 6/16 | 6-20 |
| X | P57/58 | 6' S. OF NEOS | IO | " | LF | | 6/14 | 6-20 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 6

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | 59/60/61 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| B | P43/45/47 | @ Int | T | 6/13 | BM | | 6/14 | 6-20 |
| C | P43/45/47 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| D | 43/47/51 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| E | 43/51/52 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| F | 43/52/54 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| G | 43/54/55 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| H | 43/55/58 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| I | 43/58/59 | @ Int | T | 6/13 | BM | | 6/16 | 6-20 |
| J | 43/59/60 | @ Int | T | 6/13 | BM | | 6/14 | 6-20 |
| K | 43/60 | 10' N of SEOS | D | 6/14 | BM | | 6/14 | 6-20 |
| M | 70/71 | 40' W of EEOS | WR | 6/14 | BM | | 6/14 | 6/14 |
| N | T68/69 | 56' W of EEOS | WR | 6/14 | BM | | 6/14 | 6/14 |
| P | 96,97,98,99 | @ Int | Ts | 6/17 | BM | | 6-20 | 6-20 |
| Q | 93,95,96,98 | @ Int | Ts | 6/17 | BM | | 6-20 | 6-20 |
| R | 92,93,94,95 | @ Int | Ts | 6/17 | BM | | 6-20 | 6-20 |
| S | 88,91,92,94 | @ Int | Ts | 6/17 | BM | | 6-20 | 6-20 |
| T | 87,88,89,91 | @ Int | Ts | 6/17 | BM | | 6-20 | 6/21 |
| V | 86,87,89 | @ Int | T | 6/17 | BM | | 6-20 | 6-21 |
| W | 85,86,87 | @ Int | T | 6/17 | BM | | 6-20 | 6/21 |
| X | 86,89,90 | @ Int | T | 6/17 | BM | | 6-20 | 6-21 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 7

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P57/59 | 71' W. OF EEOS | DS-27 | 6/13/08 | LF | | 6/16 | 6-20 |
| B | TIE-IN/P45 | 7' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| C | " | 29' E. OF WEOS | T | " | LF | | 6/13/08 | 6.21 |
| D | " | 51' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| E | " | 73' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| F | P59/61 | 93' W. OF EEOS | DS-28 | " | LF | | 6/16 | 6-20 |
| G | TIE-IN/P45 | 95 E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| H | TIE-IN/P45/46 | INTERSECTION | T | " | LF | | 6/13/08 | 6-20 |
| I | TIE-IN/P46 | 15' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| J | " | 37' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| K | " | 59' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| M | TIE-IN/P46/49 | INTERSECTION | T | " | LF | | 6/13/08 | 6-20 |
| N | TIE-IN/P49 | 6' E. OF WEOS | T | " | LF | | 6/13/08 | 6-20 |
| P | P60/62 | 82' W. OF EEOS | DS-29 | 6/14/08 | LF | | 6/16 | 6.21 |
| Q | P66 | 2' W. OF EEOP 7' N. OF SEOP | D | " | LF | | 6/14 | 6-20 |
| R | P62/63/66 | INTERSECTION | T | " | LF | | 6/17 | 6-20 |
| S | P63/66/64 | " | T | " | LF | | 6/17 | 6-20 |
| T | TIE-IN/P50 | 43' E. OF WEOS | DX-4 | " | LF | | 6/14/08 | 6-20 |
| V | " | EEOS | IO | " | LF | | 6/14/08 | 6-20 |
| W | P64/65/67 | INTERSECTION | T | " | LF | | 6/17 | 6-20 |
| X | P64/67 | 15' W. OF EEOS | DS-30 | " | LF | | 6/16 | 6-20 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 8

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P67/68 | 17' E. OF WEOS | DS-31 | 6/14/08 | LF | | 6/16 | 6-20 |
| B | P65 67/68 | INTERSECTION | T | " | LF | | 6/17 | 6-20 |
| C | P43/68 | 10' S. OF NEOS | DS-32 | " | LF | | 6/16 | 6-20 |
| D | P43 60/62 | INTERSECTION | T | " | LF | | 6/17 | 6-20 |
| E | P43 62/66 | " | T | " | LF | | 6/17 | 6-20 |
| F | P43 64/66 | " | T | " | LF | | 6/17 | 6-20 |
| G | P43 64/67 | " | T | " | LF | | 6/17 | 6-20 |
| H | P43 67/68 | " | T | " | LF | | 6/17 | 6-20 |
| I | " 68/69 | " | T | " | LF | | 6/17 | 6-20 |
| J | " 69/70 | " | T | " | LF | | 6/17 | 6-20 |
| K | " 70/71 | " | T | " | LF | | 6/17 | 6-20 |
| M | " 71/72 | " | T | " | LF | | 6/17 | 6-20 |
| N | " 72/73 | " | T | " | LF | | 6/17 | 6-20 |
| P | P43/44 73/74 | " | T | " | LF | | 6/17 | 6-20 |
| Q | P44 74/75 | " | T | " | LF | | 6/17 | 6-20 |
| R | P74 75/76 | " | T | " | LF | | 6/17 | 6-20 |
| S | P78/80 | 11' E. OF WEOS | DS-33 | 6/16/08 | LF | | 6/21 | 6-21 |
| T | P1/77 | 270' N. OF SEOS | DS-34 | " | LF | | 6-20 | 6/21 |
| V | P78/81 | 300' N. OF SEOS | DS-35 | " | LF | | 6-20 | 6/21 |
| W | P83/84 | 20' N. OF SEOS | DS-36 | " | LF | | 6-21 | 6/21 |
| X | P1/3 77/79 | INTERSECTION | T | " | LF | | 6-21 | 6/21 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 9

| DEFECT CODE | DEFECT LOCATION SEAM OR REPAIR | DEFECT LOCATION PANEL | DEFECT LOCATION LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|---|
| A | P77/79 | 78/80 | INTERSECTION | T | 6/16/08 | LF | | 6-21 | 6/21 |
| B | P78/80 | 81/83 | " | T | " | LF | | 6-21 | 6/21 |
| C | P81/83 | 82/84 | " | T | " | LF | | 6-21 | 6/21 |
| D | P82/85 | | 11' N. OF SEOS | DS-37 | " | LF | | 6-21 | 6-21 |
| E | P82/84 | 85/86 | INTERSECTION | T | " | LF | | 6-21 | 6/21 |
| F | P60/61 | 62 | " | T | " | LF | | 6/16 | 6-20 |
| G | P85/87 | | 307' N. OF SEOS | DS-38 | " | LF | | 6-20 | 6-20 |
| H | P89/91 | | 8' N. OF SEOS | DS-39 | " | LF | | 6-20 | 6-21 |
| I | P88/92 | | 322' N. OF SEOS | DS-40 | " | LF | | 6-20 | 6-20 |
| J | P92/93 | | 11' N. OF SEOS | DS-41 | " | LF | | 6-20 | 6-20 |
| K | P93/96 | | 335' N. OF SEOS | DS-42 | 6/17/08 | LF | | 6-20 | 6-20 |
| M | P96/97 | | 18' N. OF SEOS | DS-43 | " | LF | | 6-20 | 6-20 |
| N | P97/100 | | 371' N. OF SEOS | DS-44 | " | LF | | 6-20 | 6-20 |
| P | P100/102 | | 51' N. OF SEOS | DS-45 | " | LF | | 6-20 | 6-20 |
| Q | SC/P42 | | W. SIDE OF DS-23 | DX-5 | " | LF | capped by 12M | 6/17 | — |
| R | P104/105 | | 66' N. OF SEOS | DS-46 | " | LF | | 6-20 | 6-20 |
| S | P108/109 | | 11' E. OF WEOS | DS-47 | " | LF | | 6-20 | 6-20 |
| T | P110/111 | | 20' W. OF EEOS | DS-48 | 6/18/08 | LF | | 6-20 | 6-20 |
| V | P111/113 | | 17' W. OF EEOS | DS-49 | " | LF | | 6-20 | 6-21 |
| W | TIE-IN/P96 | | 8' W. OF EEOS | D | " | LF | | 6-20 | 6-20 |
| X | TIE-IN/P93 | | 10' W. OF EEOS | D | " | LF | | 6-20 | 6-20 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102 REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina SHEET NUMBER: 10

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | 9-1-77- | TIE @ Int | T | 6/18 | Bm | | 6/18 | 6/21 |
| B | 100 102 TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| C | 102 TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| D | 102 104 TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| E | 104-TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| F | 104,105 TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| G | 105, TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| H | 105, 108, | TIE @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| I | 108 TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| J | 108 110, TIE | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| K | 110 TIE | 7' W of EEOS | T | 6/18 | Bm | | 6-20 | 6-20 |
| M | 110, 111, 108 | @ Int | T | 6/18 | Bm | | 6-20 | 6-[illegible] |
| N | 108, 111, 112 | @ Int | T | 6/18 | Bm | | 6-20 | 6-[illegible] |
| P | 111, 112, 113 | @ Int | T | 6/18 | Bm | | 6-20 | 6-21 |
| Q | 112 118 119 | @ Int | T | 6/18 | Bm | | 6-20 | 6-20 |
| R | 112 117 118 | @ Int | T | 6/18 | Bm | | 6-20 | 6-20 |
| S | 110, 116, 115, 111 | @ Int | TS | 6/18 | Bm | | 6-20 | 6-20 |
| T | 111, 113, 115, 114 | @ Int | TS | 6/18 | Bm | | 6-20 | 6-20 |
| V | 123 128, 127 | @ Int | T | 6/18 | Bm | | 6-20 | 6-20 |
| W | 4P-P42 | E of 4P | DX5B1 | 6/19 | Bm | CAPS 4P | 6-19 | 6-20 |
| X | 4N-P38 | W of 4N | DX5A1 | 6/19 | Bm | Caps 4N | 6-19 | 6-20 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 11

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | 89, 90, 91 | @ Int | T | 6/17 | BM | | 6-20 | 6-21 |
| B | 97, 99, 100, 101 | @ Int | TS | 6/17 | BM | | 6-20 | 6-20 |
| C | 100, 101, 102, 103 | @ Int | TS | 6/17 | BM | | 6-20 | 6-20 |
| D | 104, 105, 106, 107 | @ Int | TS | 6/17 | BM | | 6-20 | 6-20 |
| E | 102, 103, 104, 106 | @ Int | TS | 6/17 | BM | | 6-20 | 6-20 |
| F | 105, 107, 108, 109 | @ Int | TS | 6/17 | BM | | 6-20 | 6-20 |
| G | 97/100/TI | @ Int | T | 6/18 | BM | | 6/18 | 6-20 |
| H | 97, 96, TE | @ Int | T | 6/18 | BM | | 6/18 | 6-20 |
| I | 97 TI | 4' W of EEOS | PT | 6/18 | BM | | 6/18 | 6-20 |
| J | 96 3/4, TIE | 3' W of EEOS | T | 6/18 | BM | | 6/18 | 6-20 |
| K | 93 96 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-20 |
| M | 93 TIE | 3' W of EEOS | T | 6/18 | BM | | 6/18 | 6-20 |
| N | 92, 93, TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-20 |
| P | 92 3 TIE | 3' W of EEOS | T | 6/18 | BM | | 6/18 | 6-20 |
| Q | 88, 92, TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-20 |
| R | 87 88 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-21 |
| S | 85 87 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-21 |
| T | 82 85 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-21 |
| V | 81 82 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6-21 |
| W | 78 81 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6/21 |
| X | 77, 78 TIE | @ Int | T | 6/18 | BM | | 6/18 | 6/21 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 12

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P78 | 4' S. OF NEOP 10 W. OF EEOP | D | 6/18/08 | LF | | 6/21 | 6-21 |
| B | P85 | 6' S. OF NEOP 10' W. OF EEOP | D | " | LF | | 6-20 | 6-21 |
| C | TIE-IN / P100 | 4' W. OF EEOS | T | " | LF | | 6-20 | 6/21 |
| D | P108 \| P112 / 117 | INTERSECTION | T | " | LF | | 6-20 | 6-20 |
| E | P108 / 109 \| 117 | " | T | " | LF | | 6-20 | 6-20 |
| F | P108/117 | 283' N. OF SEOS | DS-50 | " | LF | | 6-20 | 6-20 |
| G | P117/118 | 34' N. OF SEOS | DS-51 | " | LF | | 6-20 | 6-20 |
| H | P120/121 | 45' W. OF EEOS | DS-52 | " | LF | | 6-20 | 6-20 |
| I | P121/122 | 16' W. OF EEOS | DS-53 | " | LF | | 6-20 | 6-20 |
| J | P117 | 1' S. OF NEOP 11' E. OF WEOP | D | " | LF | | 6-20 | 6-20 |
| K | P112/119 | 11' E. OF WEOS | FM | " | LF | | 6-20 | 6-20 |
| M | P.42/44 | Caps 9Q & 5C | Failed DX-5 | 6-19 | TS | | 6-19 | 6- |
| N | P-129/131 | NEOS | DS-54 | " | TS | | 6-19 | 6-20 |
| P | P-112/119/131 | @ Int. | T | " | TS | Capped by 15B | — | — |
| Q | P-132/133 | 33' W of EEOS | DS-55 | " | TS | | 6-19 | 6-20 |
| R | P 133/134/137 | @ Int | T | " | TS | | 6-19 | 6-20 |
| S | P-124/134 | 15' E of WEOS | DS-56 | " | TS | | 6-20 | 6-20 |
| T | P-137/138 | EEOS | DS-57 | " | TS | | 6-20 | 6-20 |
| V | P-144/145 | 21' E of WEOS | DS-58 | " | TS | | 6-20 | 6-20 |
| W | P-147/148 | 40' E of WEOS | DS-59 | " | TS | | 6-20 | 6-20 |
| X | P 124/134/138 | Taken from 14Q | DX-6 | " | TS | | 6-20 | 6-20 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 13

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | 110/TIE | 28' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| B | 110/TIE | 52' West of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| C | 110/TIE | 75' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| D | 110/TIE | 98' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| E | 110/TIE | 120' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| F | 110/TIE | 144' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| G | 110/TIE | 166' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| H | 110/TIE | 189' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| I | 110 TIE | 212' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| J | 110, TIE | 234' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| K | 110, TIE | 253' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| M | 110, TIE | 258' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| N | 110, TIE | 274' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| P | 110, TIE | 279' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| Q | 110, TIE | 292' W of EEOS | WR | 6/19 | BM | | 6-20 | 6-20 |
| R | 110, TIE | 299' W of EEOS | WR | 6/19 | BM | | 6-20 | 6-20 |
| S | 110, TIE | 310' W of EEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| T | 110, TIE | 8' S of NEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| V | 110, TIE | 1' E of WEOS | T | 6/19 | BM | | 6-20 | 6-20 |
| W | 121, 122, 131 | @ Int | T | 6/19 | BM | | 6-20 | 6-20 |
| X | 122, 131, 132 | @ Int | T | 6/19 | BM | | 6-20 | 6-20 |

## DEFECT TYPES

| | | | |
|---|---|---|---|
| BO - | FUSION WELDER BURN OUT | IO - | INSUFFICIENT OVERLAP |
| CR - | CREASE | MD - | MANUFACTURER DAMAGE |
| D - | INSTALLATION DAMAGE | PT - | PRESSURE TEST CUT |
| DS-# - | FUSION WELD DESTRUCTIVE | SI - | SOIL SURFACE IRREGULARITY |
| DX-# - | EXTRUSION WELD DESTRUCTIVE | T - | THREE PANEL INTERSECTION |
| EXT - | LINER EXTENSION | VL - | VACUUM TEST LEAK |
| FM - | FISHMOUTH | WR - | WRINKLE |
| FS - | FAILED SEAM LENGTH | WS - | WELDER RESTART |

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 14

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | 133,134,135 | @ Int | T | 6/19 | Bm | | 6-19 | 6-20 |
| B | 120,121,129 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| C | 121,129,130 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| D | 113,114 | 8' S of NEOS | WR | 6/19 | Bm | | 6-19 | 6-20 |
| E | 113,114,120 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| F | 113,120,129 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| G | 122,123,132 | @ Int | T | 6/19 | Bm | | 6-19 | 6-20 |
| H | 123,127,132 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| I | 127,132,133 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| J | 126,127,133 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| K | 125,126,133,135 | @ Int | TS | 6/19 | Bm | | 6-19 | 6-20 |
| M | 124,125,135 | @ Int | T | 6/19 | Bm | | 6-19 | 6 |
| N | 134,135,136 | @ Int | T | 6/19 | Bm | | 6-19 | 6-20 |
| P | 124,135,136 | @ Int | T | 6/19 | Bm | | 6-19 | 6-20 |
| Q | 124,134,136 | @ Int | T | 6/19 | Bm | | 6-19 | 6-20 |
| R | 139,141,142 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| S | 141,142,144 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| T | 142,143,144 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| V | 141,144,145 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| W | 141,145,146 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |
| X | 141,146,147 | @ Int | T | 6/19 | Bm | | 6-20 | 6-20 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 15

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P-133/137/138 | @ Int. | T | 6-19 | TS | | 6-19 | 6-20 |
| B | P-119/131 | NEOS | DS-60 | " | TS | | 6-20 | 6-20 |
| C | P-129/130/131 | @ Int | T | " | TS | | 6-19 | 6-20 |
| D | P 112/113/129 | @ Int | T | " | TS | | 6-19 | 6-20 |
| E | P-138/139 | EEOS | DS-61 | " | TS | | 6-19 | 6-20 |
| F | P 138/140 | Middle of Seam | WR | " | TS | | 6-19 | 6-20 |
| G | P-138/140/152 | @ Int | T | " | TS | | 6-19 | 6-20 |
| H | P-138/139/140 | @ Int | T | " | TS | | 6-19 | 6-21 |
| I | P-140/151/152 | @ Int | T | " | TS | | 6-19 | 6-20 |
| J | P-138/151/152 | @ Int | T | " | TS | | 6-19 | 6-20 |
| K | P-119/131/132 | @ Int | T | 6-20 | TS | | 6-20 | 6-20 |
| M | P-119/130/132 | @ Int | T | " | TS | | 6-20 | 6-20 |
| N | 119/132/133 | @ Int | T | " | TS | | 6-20 | 6-20 |
| P | P-119/133/138 | @ Int | T | " | TS | | 6-20 | 6-20 |
| Q | P-140/141/147 | @ Int | T | " | TS | | 6-20 | 6-21 |
| R | P-139/140/141 | @ Int | T | " | TS | | 6-20 | 6-20 |
| S | P-140/147/148 | @ Int | T | " | TS | | 6-20 | 6-20 |
| T | P-140/148/149 | @ Int | T | " | TS | | 6-20 | 6-20 |
| V | P-140/149/150 | @ Int | T | " | TS | | 6-20 | 6-20 |
| W | P-140/150/151 | @ Int | T | " | TS | | 6-20 | 6-20 |
| X | P-138/150/151 | @ Int | T | " | TS | | 6-20 | 6-21 |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

**ATLANTIC COAST CONSULTING, INC**

# GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 16

| DEFECT CODE | DEFECT LOCATION: SEAM, PANEL OR REPAIR | DEFECT LOCATION: LOCATION DESCRIPTION | DEFECT TYPE | DATE LOGGED | CQA MONITOR INITIALS | REMARKS | REPAIR DATE | TEST DATE |
|---|---|---|---|---|---|---|---|---|
| A | P-111/113 | Taken from 9V | DX-7 | 6-20 | TS | | 6-20 | 6-21 |
| B | P147/148 | Taken from 12W | DX-8 | 6-20 | TS | | 6-20 | 6-20 |
| C | P-33/35 | Taken from 3R | DX-5A2 | 6-21 | TS | | 6-21 | 6-21 |
| D | P-33/34/35/36 | Caps 4K | F.P. | 6-21 | TS | Caps 4K | 6-21 | 6-21 |
| E | P-35/36/37/38 | Caps 4M | F.P. | 6-21 | TS | Caps 4M | 6-21 | 6-21 |
| F | P82/85 | Taken from 9D | DX-9 | 6-21 | TS | | 6-21 | 6-21 |
| G | P91/94/95 | Extension to S. ends | EXT | 6-21 | TS | | 6-21 | 6-21 |
| H | P-94/16G | Middle of Seam | DX-10 | 6-21 | TS | | 6-21 | 6-21 |
| I | P-37/39 | Taken from 3T | DX-5A3 | 6-24 | TS | | 6-24 | 6-24 |
| J | P-148 | 9' W of EEOP | D | 6-24 | TS | | 6-24 | 6-24 |
| K | | | | | | | | |
| M | | | | | | | | |
| N | | | | | | | | |
| P | | | | | | | | |
| Q | | | | | | | | |
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| W | | | | | | | | |
| X | | | | | | | | |

## DEFECT TYPES

BO - FUSION WELDER BURN OUT
CR - CREASE
D - INSTALLATION DAMAGE
DS-# - FUSION WELD DESTRUCTIVE
DX-# - EXTRUSION WELD DESTRUCTIVE
EXT - LINER EXTENSION
FM - FISHMOUTH
FS - FAILED SEAM LENGTH
IO - INSUFFICIENT OVERLAP
MD - MANUFACTURER DAMAGE
PT - PRESSURE TEST CUT
SI - SOIL SURFACE IRREGULARITY
T - THREE PANEL INTERSECTION
VL - VACUUM TEST LEAK
WR - WRINKLE
WS - WELDER RESTART

**ATLANTIC COAST CONSULTING, INC**

of NORTH CAROLINA, PLLC

# APPENDIX K

## Repair Logs

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/11/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: Ø

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1B | 746 | DS-2 | BS | 2X5 | 14 | 14 | — | LF | |
| 2 | 1H | 757 | DS-4 | " | 2X5 | 14 | 28 | — | LF | |
| 3 | 1I | 838 | DS-5 | " | 2X5 | 14 | 42 | — | LF | |
| 4 | 1C | 843 | DS-3 | " | 2X5 | 14 | ~~56~~ 0 | DX-1 | LF | |
| 5 | 1A | 911 | DS-1 | " | 2X5 | 14 | 14 | — | LF | |
| 6 | 1Q | 921 | P | " | 2X4 | 12 | 26 | — | LF | |
| 7 | 1T | 1018 | P | " | 2X7 | 18 | 44 | — | LF | |
| 8 | 1V | 1045 | P | " | 4X4 | 16 | 60 | — | LF | |
| 9 | 1P | 1055 | DX-1 | " | 2X5 | 14 | 74 | — | LF | |
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DAILY TOTAL FOR WELDED SEAM: 130

DESTRUCTIVE LENGTH CARRY - OVER: 74

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-12-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 13

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 0

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3B | 0653 | DS-11 | TS | 2X4' | 12 | 12 | | BM | |
| 2 | 3D | 0702 | DS-13 | " | 2X5 | 14 | 26 | | TS | |
| 3 | 3C | 0714 | DS-12 | " | 2X5 | 14 | 40 | | TS | |
| 4 | 3E | 0735 | DS-14 | TS | 2X4 | 12 | 52/0 | DX-2 | TS | |
| 5 | 4A | 0755 | DX-2 | TS | 2X4 | 12 | 12 | | BM | |
| 6 | 3A | 0803 | DS-10 | TS | 2X4 | 12 | 24 | | BM | |
| 7 | 4B | 0820 | P | TS | 2X2 | 8 | 32 | | BM | |
| 8 | 2Q | 0830 | P | TS | 2X2 | 8 | 40 | | BM | |
| 9 | 2P | 0848 | P | TS | 2X8 | 32 | 72 | | BM | |
| 10 | 4E | 0850 | P | TS | 2X2 | 8 | 80 | | BM | |
| 11 | 2R | 0855 | P | TS | 2X2 | 8 | 88 | | BM | |
| 12 | 4C | 0858 | P | TS | 1X2 | 6 | 94 | | BM | |
| 13 | 2S | 0900 | P | TS | 1X1 | 4 | 98 | | BM | |
| 14 | 4D | 0903 | P | TS | 1X2 | 6 | 104 | | BM | |
| 15 | 2T | 0912 | P | TS | 1X2 | 6 | 110 | | BM | |
| 16 | 4F | 0915 | P | TS | 1X1 | 4 | 114 | | BM | |
| 17 | 2W | 0917 | P | TS | 1X2 | 6 | 120 | | BM | |
| 18 | 2V | 0930 | P | " | 2X6 | 16 | 136 | | BM | |
| 19 | 2X | 0942 | P | " | 2X6 | 16 | 152 | | BM | |
| 20 | 3F | 0948 | DS-15 | " | 2X4 | 12 | 164 | | BM | |
| 21 | 4G | 1002 | P | " | 1X1 | 4 | 168 | | BM | |
| 22 | 1R | 1011 | P | " | 2X4 | 12 | 180 | | BM | |
| 23 | 1W | 1015 | P | " | 2X4 | 12 | 192 | | BM | |
| 24 | 1X | 1017 | P | " | 2X3 | 10 | 202 | | BM | |
| 25 | | | | | | | | | | |
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DAILY TOTAL FOR WELDED SEAM: 254

DESTRUCTIVE LENGTH CARRY - OVER: 202

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/12/09

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 74

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1D | 0630 | P | JC | 2X4 | 12 | 86 | — | LF | |
| 2 | 1E | 0700 | P | " | 2X2 | 8 | 94 | — | LF | COVERS P10/11 |
| 3 | 1F | 0702 | P | " | 1X1 | 4 | 98 | — | LF | |
| 4 | 1G | 0711 | P | " | 2X4 | 12 | 110 | — | LF | |
| 5 | 1S | 0732 | DS-9 | EB | 2X4 | 12 | 122 | — | LF | |
| 6 | 1N | 0737 | DS-8 | " | 2X4 | 12 | 134 | — | LF | |
| 7 | 1K | 0744 | DS-6 | " | 2X5 | 14 | 148 | — | LF | |
| 8 | 1J | 0754 | P | " | 1X2 | 6 | 154 | — | LF | |
| 9 | 2D | 0800 | P | " | 2X4 | 12 | 166 | — | LF | |
| 10 | 2C | 0805 | P | " | 2X2 | 8 | 174 | — | LF | |
| 11 | 2B | 0808 | P | " | 1X1 | 4 | 178 | — | LF | |
| 12 | 2A | 0812 | P | " | 2X2 | 8 | 186 | — | LF | |
| 13 | 2F | 0816 | P | " | 2X2 | 8 | 194 | — | LF | |
| 14 | 2G | 0821 | P | " | 2X3 | 10 | 204 | — | LF | |
| 15 | 2H / 2I | 0841 | P | " | 2X5 | 14 | 218 | — | LF | COVERS P18/19 & BOTH DEFECTS |
| 16 | 2J | 0850 | P | " | 2X2 | 152 8 | 226 | — | LF | |
| 17 | 2K | 0855 | P | " | 2X3 | 10 | 236 | — | LF | |
| 18 | 2M | 0908 | P | " | 2X2 | 8 | 244 | — | LF | |
| 19 | 2N | 0915 | P | " | 2X4 | 10 | 254 | — | LF | |
| 20 | 1M | 0947 | DS-7 | " | 2X5 | 14 | 268 | — | LF | |
| 21 | 3H | 1426 | P | BS | 2X4 | 12 | 280 | — | LF | |
| 22 | 3I | 1430 | P | " | 1X1 | 4 | 287-291 | — | LF | |
| 23 | 3M | 1506 | P | " | 1X1 | 4 | 305-309 | — | LF | |
| 24 | 3N | 1525 | P | " | 1X1 | 4 | 316-320 | — | LF | |
| 25 | 3P | 1529 | P | " | 1X1 | 4 | 334-338 | — | LF | |
| 26 | 3Q | 1536 | P | " | 1X1 | 4 | 345-349 | — | LF | |
| 27 | 4I | 1600 | P | " | 2X4 | 12 | 358-370 | — | LF | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 238 Repair log only

DESTRUCTIVE LENGTH CARRY - OVER: 370 Seaming & Repair logs

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/13/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY:

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 370

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3G | 0644 | DS-16 | BS | 2X4 | 12 | 382 | — | BM | |
| 2 | 3K | 0659 | DS-18 | BS | 2X4 | 12 | 394 | — | BM | |
| 3 | 4J | 0716 | P | BS | 2X4 | 12 | 406 | — | BM | |
| 4 | 4H | 0732 | P | BS | 2X3 | 10 | 416 | — | BM | |
| 5 | 2E | 0749 | P | BS | 2X2 | 8 | 424 | — | BM | |
| 6 | 3J | 0820 | DS-17 | BS | 2X5 | 14 | 438 | — | BM | |
| 7 | 3W | 0914 | P | BS | 2X2 | 8 | 443-451 | — | LF | |
| 8 | 3X | 0920 | P | " | 1X1 | 4 | 458-462 | — | LF | |
| 9 | 5A | 0929 | P | " | 1X1 | 4 | 7-11 | — | LF | |
| 10 | 5B | 1042 | DX-3 | " | 2X4 | 12 | 23 | — | LF | |
| 11 | 5D | 1058 | P | " | 2X2 | 8 | 30-38 | — | LF | |
| 12 | 5E | 1103 | P | " | 1X1 | 4 | 52-56 | — | LF | |
| 13 | 5F | 1243 | P | " | 2X2 | 8 | 63-71 | — | LF | |
| 14 | 5G | 1248 | P | " | 1X1 | 4 | 85-89 | — | LF | |
| 15 | 5H | 1401 | P | " | 1X1 | 4 | 99-103 | — | LF | |
| 16 | 5I | 1408 | P | " | 1X1 | 4 | 114-118 | — | LF | |
| 17 | 5J | 1414 | P | " | 2X2 | 8 | 129-137 | — | LF | |
| 18 | 7B | 1550 | P | " | 2X2 | 8 | 154-162 | — | LF | |
| 19 | 7C | 1558 | P | " | 2X2 | 8 | 184-192 | — | LF | |
| 20 | 7D | 1611 | P | " | 1X1 | 4 | 214-218 | — | LF | |
| 21 | 7E | 1637 | P | " | 2X2 | 8 | 240-248 | — | LF | |
| 22 | 7G | 1658 | P | " | 1X1 | 4 | 270-274 | — | LF | |
| 23 | 7H | 1708 | P | " | 1X1 | 4 | 282-286 | — | LF | |
| 24 | 7I | 1725 | P | " | 1X1 | 4 | 301-305 | — | LF | |
| 25 | 7J | 1735 | P | " | 1X1 | 4 | 327-331 | — | LF | |
| 26 | 7K | 1749 | P | " | 1X1 | 4 | 353-357 | — | LF | |
| 27 | 7M | 1800 | P | " | 1X1 | 4 | 379-383 | — | LF | |
| 28 | 7N | 1805 | P | " | 1X1 | 4 | 389-393 | — | LF | |
| 29 | | | | | | | | | | |
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DAILY TOTAL FOR WELDED SEAM: 192 REPAIRS ONLY

DESTRUCTIVE LENGTH CARRY - OVER: 393

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/14/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 13

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 202

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6M | 1351 | P | EB | 2x7 | 18 | 220 | — | BM | |
| 2 | 6N | 1354 | P | EB | 2x3 | 10 | 230 | — | BM | |
| 3 | 6K | 1416 | P | EB | 2X5 | 14 | 244 | — | LF | |
| 4 | 6J | 1420 | P | " | 1X1 | 4 | 248 | — | LF | |
| 5 | 3V | 1428 | DS-22 | " | 2X4 | 12 | 260 | — | LF | |
| 6 | 3S | 1433 | DS-20 | " | 2X4 | 12 | 272 | — | LF | |
| 7 | 7Q | 1435 | P | " | 1X1 | 4 | 276 | — | LF | |
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DAILY TOTAL FOR WELDED SEAM: 74

DESTRUCTIVE LENGTH CARRY - OVER: 276

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/14/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 10

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7V | 0848 | P | BS | 3X4 | 14 | 24 | — | LF | |
| 2 | 7T | 0901 | DX-4 | " | 2X4 | 12 | 36 | — | LF | |
| 3 | 6B | 1348 | P | IS | 2X3 | 10 | 46 | — | BM | |
| 4 | 5K | 1405 | P | IS | 2X2 | 8 | 54 | — | BM | |
| 5 | 4T | 1406 | P | IS | 2X2 | 8 | 62 | — | BM | |
| 6 | 4S | 1409 | P | IS | 2X2 | 8 | 70 | — | BM | |
| 7 | 4V | 1413 | P | IS | 2X2 | 8 | 78 | — | BM | |
| 8 | 5P | 1416 | P | IS | 2X2 | 8 | 86 | — | BM | |
| 9 | 5S | 1420 | P | IS | 2X2 | 8 | 94 | — | BM | |
| 10 | 5R | 1422 | P | IS | 2X2 | 8 | 102 | — | BM | |
| 11 | 4X | 1426 | P | IS | 2X2 | 8 | 110 | — | BM | |
| 12 | 5T | 1435 | P | IS | 2X2 | 8 | 118 | — | BM | |
| 13 | 4W | 1433 | P | IS | 2X2 | 8 | 126 | — | BM | |
| 14 | 5X | 1440 | P | IS | 2X6 | 12 | 138 | — | BM | |
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| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 128

DESTRUCTIVE LENGTH CARRY - OVER: 138

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/16/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY:

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 138

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5M | 1031 | DS-24 | BS | 2X4 | 12 | 150 | — | LF | |
| 2 | 5N | 1039 | DS-25 | " | 2X4 | 12 | 162 | — | LF | |
| 3 | 5Q | 1125 | DS-26 | " | 2X4 | 12 | 174 | — | LF | |
| 4 | 7A | 1308 | DS-27 | " | 2X4 | 12 | 186 | — | LF | |
| 5 | 6A | 1316 | P | " | 2X2 | 8 | 194 | — | LF | |
| 6 | 9F | 1320 | P | " | 2X3 | 10 | 204 | — | LF | |
| 7 | 7F | 1329 | DS-28 | " | 2X5 | 14 | 218 | — | LF | |
| 8 | 7P | 1334 | DS-29 | " | 2X4 | 12 | 230 | — | LF | |
| 9 | 6C | 1520 | P | " | 2X2 | 8 | 238 | — | BM | |
| 10 | 6D | 1523 | P | " | 2X2 | 8 | 246 | — | BM | |
| 11 | 6E | 1526 | P | " | 2X2 | 8 | 254 | — | BM | |
| 12 | 6F | 1530 | P | " | 2X2 | 8 | 262 | — | BM | |
| 13 | 6G | 1533 | P | " | 2X2 | 8 | 270 | — | BM | |
| 14 | 6H | 1537 | P | " | 2X2 | 8 | 278 | — | BM | |
| 15 | 5V | 1543 | P | " | 2X5 | 14 | 292 | — | BM | |
| 16 | 5W | 1546 | P | " | 2X2 | 8 | 300 | — | BM | |
| 17 | 6I | 1548 | P | " | 2X2 | 8 | 308 | — | BM | |
| 18 | TX | 1550 | DS-30 | " | 2X5 | 14 | 322 | — | BM | |
| 19 | 8A | 1600 | DS31 | " | 2X4 | 12 | 334 | — | BM | |
| 20 | 8C | 1612 | DS 32 | " | 2X4 | 12 | 346 | — | BM | |
| 21 | | | | | | | | | | |
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| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 208

DESTRUCTIVE LENGTH CARRY - OVER: 346

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/17/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 346

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8D | 0735 | P | BS | 1X1 | 4 | 350 | — | LF | |
| 2 | 8E | 0737 | P | " | 1X1 | 4 | 354 | — | LF | |
| 3 | 8F | 0741 | P | " | 1X1 | 4 | 358 | — | LF | |
| 4 | 7S | 0756 | P | " | 2X2 | 8 | 366 | — | LF | |
| 5 | 7R | 0759 | P | " | 2X3 | 10 | 376 | — | LF | |
| 6 | 7W | 0801 | P | " | 1X1 | 4 | 380 | — | LF | |
| 7 | 8B | 0804 | P | " | 1X1 | 4 | 384 | — | LF | |
| * 8 | 8H | 0822 | P | " | 1X1 | 4 | 388 | — | LF | |
| 9 | 8I | 0825 | P | " | 1X1 | 4 | 392 | — | LF | |
| 10 | 8J | 0827 | P | " | 1X1 | 4 | 396 | — | LF | |
| 11 | 8K | 0849 | P | " | 1X1 | 4 | 400 | — | LF | |
| 12 | 8M | 0851 | P | " | 1X1 | 4 | 404 | — | LF | |
| 13 | 8N | 0854 | P | " | 1X1 | 4 | 408 | — | LF | |
| 14 | 8P | 0857 | P | " | 2X3 | 10 | 418 | — | LF | |
| 15 | 8Q | 0859 | P | " | 1X1 | 4 | 422 | — | LF | |
| 16 | 8R | 0902 | P | " | 1X1 | 4 | 426 | — | LF | |
| 17 | 4Q | 0919 | P | " | 2X5 | 14 | 440 | — | LF | |
| 18 | 4P | 0924 | P | " | 2X5 | 14 | 454 | — | LF | |
| 19 | 5C | 0932 | DS-23 | " | 2X5 | 14 | ~~468~~ 0 | DX-5 | LF | |
| 20 | 4N | 0949 | P | " | 2X4 | 12 | 12 | — | LF | |
| 21 | 4M | 0952 | P | " | 2X3 | 10 | 22 | — | LF | |
| 22 | 4K | 0956 | P | " | 2X3 | 10 | 32 | — | LF | |
| 23 | 3R | 1010 | DS-19 | " | 2X4 | 12 | 44 | — | LF | |
| 24 | 3T | 1018 | DS-21 | " | 2X5 | 14 | 58 | — | LF | |
| 25 | 9Q | 1031 | DX-5 | " | 2X4 | 12 | 70 | — | LF | |
| 26 | 4R | 1123 | P | " | 2X3 | 10 | 80 | — | LF | |
| * 27 | 8G | 0820 | P | " | 2X2 | 8 | 88 | — | LF | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 202

DESTRUCTIVE LENGTH CARRY - OVER: 88

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/18/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 88

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11G | 0708 | P | BS | 1X1 | 4 | 92 | — | LF | |
| 2 | 11H | 0718 | P | " | 1X2 | 6 | 109 - 115 | — | LF | |
| 3 | 11I | 0738 | P | " | 2X2 | 8 | 119 - 127 | — | LF | |
| 4 | 11J | 0745 | P | " | 2X2 | 8 | 144 - 152 | — | LF | |
| 5 | 11K | 0747 | P | " | 1X1 | 4 | 156 - 160 | — | LF | |
| 6 | 11M | 0820 | P | " | 1X1 | 4 | 178 - 182 | — | LF | |
| 7 | 11N | 1343 | P | ER | 1X1 | 4 | 185 - 189 | — | LF | |
| 8 | 11P | 1412 | P | " | 1X1 | 4 | 207 - 211 | — | LF | |
| 9 | 11Q | 1416 | P | " | 1X1 | 4 | 214 - 218 | — | LF | |
| 10 | 11R | 1427 | P | " | 2X5 | 14 | 239 - 253 | — | LF | |
| 11 | 11S | 1440 | P | " | 2X4 | 12 | 274 - 286 | — | LF | |
| 12 | 11T | 1452 | P | " | 2X3 | 10 | 307 - 317 | — | LF | |
| 13 | 11V | 1502 | P | " | 1X3 | 8 | 339 - 347 | — | LF | |
| 14 | 11W | 1518 | P | " | 2X2 | 8 | 368 - 376 | — | LF | |
| 15 | 11X | 1525 | P | " | 1X2 | 6 | 397 - 403 | — | LF | |
| 16 | 10A | 1535 | P | " | 1X6 | 14 | 424 - 438 | — | LF | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
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| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 118 REPAIRS ONLY

DESTRUCTIVE LENGTH CARRY - OVER: 438

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6/19/08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 OF 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 438

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10X | 0720 | DX-5A1 | BS | 3X5 | 16 | 454 | — | LF | |
| 2 | 10W | 0732 | DX-5B1 | " | 3X5 | 16 | 470 | — | LF | |
| 3 | 12M | 0801 | C | " | 4X4 | 16 | 486 | — | LF | CAPPED 5CE QQ |
| 4 | 14Q | 1445 | P | " | 2X4 | 12 | 490/8 | DX-6 | TS | |
| 5 | 14P | 1447 | P | " | 2X2 | 8 | 16 | | TS | |
| 6 | 14N | 1451 | P | " | 2X3 | 10 | 26 | | TS | |
| 7 | 14A | 1456 | P | " | 2X4 | 12 | 38 | | TS | |
| 8 | 12R | 1500 | P | " | 2X2 | 8 | 46 | | TS | |
| 9 | 15A | 1507 | P | " | 2X2 | 8 | 54 | | TS | |
| 10 | 12Q | 1511 | P | " | 2X4 | 12 | 66 | | TS | |
| 11 | 12N | 1520 | P | " | 2X6 | 16 | 82 | | TS | |
| 12 | 15C | 1524 | P | " | 2X2 | 8 | 90 | | TS | |
| 13 | 15D | 1526 | P | " | 2X2 | 8 | 98 | | TS | |
| 14 | 14M | 1533 | P | " | 2X2 | 8 | 106 | | TS | |
| 15 | 14K | 1537 | P | " | 2X3 | 10 | 116 | | TS | |
| 16 | 14G | 1545 | P | " | 2X4 | 12 | 128 | | TS | |
| 17 | 14D | 1550 | P | " | 2X2 | 8 | 136 | | TS | |
| 18 | 15G | 1603 | P[S] | " | (1x1)+(2x4)+6 | 22 | 158 | | TS | |
| 19 | 15F | 1608 | P[S] | " | (1x1)+(2x3)+6 | 20 | 178 | | TS | |
| 20 | 15H | 1612 | P | " | 1X2 | 6 | 184 | | TS | |
| 21 | 15E | 1615 | P | " | 2X6 | 16 | 200 | | TS | |
| 22 | 15I | 1619 | P | " | 2X2 | 8 | 208 | | TS | |
| 23 | 15J | 1623 | P | " | 1X2 | 6 | 214 | | TS | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
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| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 266

DESTRUCTIVE LENGTH CARRY - OVER: 214

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-20-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 3

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 214

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12F | 0648 | P | EB | 2x4 | 12 | 226 | | TS | |
| 2 | 12G | 0710 | P | " | 2x4 | 12 | 238 | | TS | |
| 3 | 9S | 0715 | P | " | 2x4 | 12 | 250 | | TS | |
| 4 | 12E | 0719 | P | " | 2x2 | 8 | 258 | | TS | |
| 5 | 9R | 0723 | P | " | 2x4 | 12 | 270 | | TS | |
| 6 | 9P | 0731 | P | " | 2x4 | 12 | 282 | | TS | |
| 7 | 11F | 0735 | P | " | 2x3 | 10 | 292 | | TS | |
| 8 | 11D | 0742 | P | " | 2x3 | 10 | 302 | | TS | |
| 9 | 11E | 0746 | P | " | 2x4 | 12 | 314 | | TS | |
| 10 | 11C | 0751 | P | " | 2x3 | 10 | 324 | | TS | |
| 11 | 11B | 0756 | P | " | 2x3 | 10 | 334 | | TS | |
| 12 | 6P | 0801 | P | " | 2x2 | 8 | 342 | | TS | |
| 13 | 9M | 0810 | P | " | 2x4 | 12 | 354 | | TS | |
| 14 | 6Q | 0815 | P | " | 2x4 | 10 | 364 | | TS | |
| 15 | 6R | 0821 | P | " | 2x4 | 12 | 376 | | TS | |
| 16 | 9J | 0826 | P | " | 2x4 | 12 | 388 | | TS | |
| 17 | 6S | 0834 | P | " | 2x4 | 12 | 400 | | TS | |
| 18 | 14R | 0849 | P | " | 1x1 | 4 | 404 | | TS | |
| 19 | 14T | 0852 | P | " | 1x2 | 6 | 410 | | TS | |
| 20 | 14S | 0855 | P | " | 1x1 | 4 | 414 | | TS | |
| 21 | 14V | 0904 | P | " | 1x2 | 6 | 420 | | TS | |
| 22 | 12V | 0910 | P | " | 2x4 | 12 | 432 | | TS | |
| 23 | 14W | 0913 | P | " | 1x1 | 4 | 436 | | TS | |
| 24 | 14X | 0916 | P | " | 1x2 | 6 | 442 | | TS | |
| 25 | 15Q | 0924 | P | " | 1x2 | 6 | 448 | | TS | |
| 26 | 15R | 0927 | P | " | 2x2 | 8 | 456 | | TS | |
| 27 | 15S | 0931 | P | " | 1x2 | 6 | 462 | | TS | |
| 28 | 15T | 0934 | P | " | 1x2 | 6 | 468 | | TS | |
| 29 | 15V | 0938 | P | " | 1x2 | 6 | 474 | | TS | |
| 30 | 15W | 0949 | P | " | 1x2 | 6 | 480 | | TS | |

DAILY TOTAL FOR WELDED SEAM: 266

DESTRUCTIVE LENGTH CARRY - OVER: 480

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-20-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2 of 3

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 480

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15X | 0954 | P | EB | 2X2 | 8 | 488 | | TS | |
| 2 | 12W | 1005 | P | " | 2X4 | 12 | 500/0 | DX-B | TS | |
| 3 | 16B | 1022 | P | " | 2X4 | 12 | 12 | | TS | |
| 4 | 12S | 1035 | P | " | 2X4 | 12 | 24 | | TS | |
| 5 | 12T | 1058 | P | " | 2X4 | 12 | 36 | | TS | |
| 6 | 15P | 1108 | P | " | 2X2 | 8 | 44 | | TS | |
| 7 | 15N | 1115 | P | " | 1X2 | 6 | 50 | | TS | |
| 8 | 15M | 1118 | P | " | 1X2 | 6 | 56 | | TS | |
| 9 | 15K | 1126 | P | " | 1X2 | 6 | 62 | | TS | |
| 10 | 15B | 1139 | P | " | 4X7 | 22 | 84 | | TS | Caps 12P |
| 11 | 12K | 1145 | P | " | 2X4 | 12 | 96 | | TS | |
| 12 | 10Q | 1150 | P | " | 1X2 | 6 | 102 | | TS | |
| 13 | 10P | 1319 | P | " | 2X2 | 8 | 110 | | TS | |
| 14 | 16A | 1323 | P | " | 2X3 | 10 | 120 | | TS | |
| 15 | 10R | 1343 | P | " | 1X2 | 6 | 126 | | TS | |
| 16 | 12J | 1348 | P | " | 1X2 | 6 | 132 | | TS | |
| 17 | 12D | 1351 | P | " | 2X3 | 10 | 142 | | TS | |
| 18 | 10N | 1400 | P | " | 1X2 | 6 | 148 | | TS | |
| 19 | 10M | 1404 | P | " | 1X2 | 6 | 154 | | TS | |
| 20 | 9T | 1409 | P | " | 2X4 | 12 | 166 | | TS | |
| 21 | 9N | 1428 | P | " | 2X4 | 12 | 178 | | TS | |
| 22 | 9K | 1433 | P | " | 2X4 | 12 | 190 | | TS | |
| 23 | 9I | 1441 | P | " | 2X4 | 12 | 202 | | TS | |
| 24 | 9G | 1445 | P | " | 2X4 | 12 | 214 | | TS | |
| 25 | 12B | 1447 | P | " | 1X1 | 4 | 218 | | TS | |
| 26 | 9X | 1450 | P | " | 1X1 | 4 | 222 | | TS | |
| 27 | 9W | 1453 | P | " | 1X1 | 4 | 226 | | TS | |
| 28 | 8V | 1500 | P | " | 2X4 | 12 | 238 | | TS | |
| 29 | 8T | 1504 | P | " | 2X4 | 12 | 250 | | TS | |
| 30 | 6T | 1515 | P | " | 2X4 | 12 | 262 | | TS | |

DAILY TOTAL FOR WELDED SEAM: 276

DESTRUCTIVE LENGTH CARRY - OVER: 262

8V 1500 2X4
8T 1504 2X4

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-20-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 3 of 3

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 262

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9H | 1517 | P | EB | 2x4 | 12 | 274 | | TS | |
| 2 | 11A | 1519 | P | " | 1x2 | 6 | 280 | | TS | |
| 3 | 6X | 1522 | P | " | 2x2 | 8 | 288 | | TS | |
| 4 | 6V | 1525 | P | " | 1x2 | 6 | 294 | | TS | |
| 5 | 6W | 1526 | P | " | 1x2 | 6 | 300 | | TS | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
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DAILY TOTAL FOR WELDED SEAM: 20

DESTRUCTIVE LENGTH CARRY - OVER: 300

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-20-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [signature]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 2

MACHINE NUMBER: 013

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 276

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12 X | 0640 | P | IS | 2x3 | 10 | 286 | | TS | |
| 2 | 14 J | 0650 | P | " | 1x2 | 6 | 292 | | TS | |
| 3 | 14 I | 0653 | P | " | 1x2 | 6 | 298 | | TS | |
| 4 | 14 H | 0655 | P | " | 1x2 | 6 | 304 | | TS | |
| 5 | 10 V | 0658 | P | " | 1x2 | 6 | 310 | | TS | |
| 6 | 13 X | 0704 | P | " | 1x2 | 6 | 316 | | TS | |
| 7 | 13 W | 0706 | P | " | 1x2 | 6 | 322 | | TS | |
| 8 | 14 C | 0710 | P | " | 1x2 | 6 | 328 | | TS | |
| 9 | 14 B | 0718 | P | " | 1x2 | 6 | 334 | | TS | |
| 10 | 12 H | 0722 | P | " | 2x4 | 12 | 346 | | TS | |
| 11 | 14 F | 0728 | P | " | 1x2 | 6 | 352 | | TS | |
| 12 | 14 E | 0730 | P | " | 1x2 | 6 | 358 | | TS | |
| 13 | 12 I | 0738 | P | " | 2x4 | 12 | 370 | | TS | |
| 14 | 10 T | 0746 | P | " | 2x3 | 10 | 380 | | TS | |
| 15 | 10 S | 0752 | P | " | 3x4 | 14 | 394 | | TS | |
| 16 | 13 V | 0810 | P | " | 1x1 | 4 | 398 | | TS | |
| 17 | 13 S | 0820 | P | " | 2x2 | 8 | 406 | | TS | |
| 18 | 13 T | 0825 | P | " | (1x1)+2 | 6 | 412 | | TS | |
| 19 | 13 R | 0830 | P | " | 1x1 | 4 | 416 | | TS | |
| 20 | 13 Q | 0831 | BGW | " | 2 | 2 | 418 | | TS | |
| 21 | 13 P | 0832 | P | " | 1x1 | 4 | 422 | | TS | |
| 22 | 13 N | 0837 | P | " | 1x2 | 6 | 428 | | TS | |
| 23 | 13 M | 0840 | P | " | 2x2 | 8 | 436 | | TS | |
| 24 | 13 K | 0844 | P | " | 2x2 | 8 | 444 | | TS | |
| 25 | 13 J | 0900 | P | " | 1x1 | 4 | 448 | | TS | |
| 26 | 13 I | 0903 | P | " | 1x1 | 4 | 452 | | TS | |
| 27 | 13 H | 0906 | P | " | 1x2 | 6 | 458 | | TS | |
| 28 | 13 G | 0912 | P | " | 1x2 | 6 | 464 | | TS | |
| 29 | 13 F | 0915 | P | " | 1x2 | 6 | 470 | | TS | |
| 30 | 13 E | 0922 | P | " | 1x1 | 4 | 474 | | TS | |

DAILY TOTAL FOR WELDED SEAM: 198

DESTRUCTIVE LENGTH CARRY - OVER: 474

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-20-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2 of 2

MACHINE NUMBER: 013

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 474

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13D | 0925 | P | IS | 1x2 | 6 | 480 | | TS | |
| 2 | 9V | 0940 | P | " | 2x4 | 12 | 492/0 | DX-7 | TS | |
| 3 | 13C | 0953 | P | " | 1x1 | 4 | 4 | | TS | |
| 4 | 13B | 957 | P | " | 1x2 | 6 | 10 | | TS | |
| 5 | 13A | 1010 | P | " | 1x1 | 4 | 14 | | TS | |
| 6 | 10K | 1015 | P | " | 1x1 | 4 | 18 | | TS | |
| 7 | 10J | 1425 | P | " | 1x2 | 6 | 333/339 | | TS | |
| 8 | 10I | 1430 | P | " | 1x1 | 4 | 343 | | TS | |
| 9 | 10H | 1435 | P | " | 2x4 | 12 | 355 | | TS | |
| 10 | 10G | 1442 | P | " | 1x1 | 4 | 359 | | TS | |
| 11 | 10F | 1445 | P | " | 1x1 | 4 | 363 | | TS | |
| 12 | 10E | 1448 | P | " | 1x1 | 4 | 367 | | TS | |
| 13 | 10D | 1450 | P | " | 1x2 | 6 | 373 | | TS | |
| 14 | 10C | 1455 | P | " | 1x1 | 4 | 377 | | TS | |
| 15 | 10B | 1457 | P | " | 1x2 | 6 | 383 | | TS | |
| 16 | 12C | 1500 | P | " | 1x2 | 6 | 389 | | TS | |
| 17 | | | | | | | | | | |
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DAILY TOTAL FOR WELDED SEAM: 92

DESTRUCTIVE LENGTH CARRY - OVER: 460 442

Seaming and Repair Log

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-21-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 300

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 C | 0628 | P | EM | 3x5 | 16 | 316 | DX5A2 | TS | |
| 2 | 16 E | 0640 | C | " | 3x4 | 14 | 330 | | TS | |
| 3 | 16 D | 0648 | C | " | 3x4 | 14 | 344 | | TS | |
| 4 | 8 S | 0719 | P | " | 2x4 | 12 | 356 | | TS | |
| 5 | 8 X | 0719 | P | " | 2x4 | 12 | 368 | | TS | |
| 6 | 9 A | 0723 | P | " | 1x2 | 6 | 374 | | TS | |
| 7 | 9 B | 0729 | P | " | 2x4 | 12 | 386 | | TS | |
| 8 | 9 C | 0734 | P | " | 2x2 | 8 | 394 | | TS | |
| 9 | 9 E | 0740 | P | " | 2x3 | 10 | 404 | | TS | |
| 10 | 8 W | 0750 | P | " | 2x4 | 12 | 416 | | TS | |
| 11 | 9 D | 0758 | P | " | 2x4 | 12 | 428/0 | DX-9 | TS | |
| 12 | 12A | 0805 | P | " | 1x1 | 4 | 4 | | TS | |
| 13 | 16F | 0825 | P | " | 2x4 | 12 | 16 | | TS | |
| 14 | | | | | | | | | | |
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DAILY TOTAL FOR WELDED SEAM: 144

DESTRUCTIVE LENGTH CARRY - OVER: 16

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-24-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 013

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 482 (see repair log)

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16G | 0940 | EXT | IS | 82 | 82 | 490/74 | DX-10 | TS | |
| 2 | 16H | 0959 | P | " | 2x4 | 12 | 86 | | TS | |
| 3 | | | | | | | | | | |
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| 30 | | | | | | | | | | |

DAILY TOTAL FOR WELDED SEAM: 94

DESTRUCTIVE LENGTH CARRY - OVER: 86

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: A011.102

DATE OF REPAIR: 6-24-08

PROJECT TITLE: CMS Landfill V Cell 2G

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 513

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 16

| LINE NUMBER | DEFECT CODE | APPROX. TIME OF WELD | TYPE OF REPAIR | QC TECH. INITIALS | APPROX. DIMENSION OF WELD | APPROX. LINEAR FT. WELDED | LENGTH FROM PREVIOUS DESTRUCTIVE | DESTRUC. NUMBER | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 I | 08 12 | C | IS | 3x7 | 20 | 36 | DL-5A3 | RTH | |
| 2 | 16 J | 0840 | P | " | 1x2 | 6 | 42 | | RTH | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
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DAILY TOTAL FOR WELDED SEAM: 26

DESTRUCTIVE LENGTH CARRY - OVER: 42

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX L

## Seam Pressure Test Logs

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/10/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P-1 | P3 | EEOS | WEOS | BS | 1703 | 1708 | 35 | 35 | P | | ✓ | BM | |
| 2 | P-2 | P-4 | WEOS | EEOS | BS | 1704 | 1709 | 35 | 35 | P | | ✓ | Bm | |
| 3 | P.3 | P.4 | SEOS | NEOS | BS | 1734 | 1739 | 35 | 34 | P | | ✓ | BM | |
| 4 | P1 | P-2 | SEOS | NEOS | BS | 1734 | 1739 | 35 | 34 | P | | ✓ | Bm | |
| 5 | P-4 | P.6 | SEOS | NEOS | BS | 1839 | 1844 | 35 | 35 | P | | ✓ | Bm | |
| 6 | P.2 | P5 | SEOS | NEOS | BS | 1839 | 1844 | 35 | 35 | P | | ✓ | Bm | |
| 7 | P.5 | P-6 | EEOS | WEOS | BS | 1826 | 1831 | 35 | 35 | P | | ✓ | BM | |
| 8 | P-2 | P-6 | SEOS | NEOS | BS | 1839 | 1844 | 35 | 35 | P | | ✓ | BM | |
| 9 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6-11-08

REVIEWED BY: ☆

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | PASS OR FAIL | NO | YES | | |
| 1 | P-6 | P-8 | SEOS | NEOS | BS | 0621 | 0626 | 35 | 35 | P | | ✓ | BM | |
| 2 | P-8 | P-10 | SEOS | NEOS | BS | 0622 | 0627 | 35 | 35 | P | | ✓ | BM | |
| 3 | P-7 | P-8 | 2E | EEOS | BS | 0700 | 0705 | 32 | 32 | P | ✓ | | BM | |
| 4 | P-7 | P-8 | 2E | WEOS | BS | 0704 | 0709 | 35 | 35 | P | | ✓ | BM | |
| 5 | P-7 | P-9 | SEOS | NEOS | " | 0622 | 0627 | 35 | 35 | P | | ✓ | BM | |
| 6 | P-5 | P-7 | SEOS | NEOS | " | 0621 | 0626 | 35 | 35 | P | | ✓ | BM | |
| 7 | P-9 | P-10 | WEOS | EEOS | " | 0659 | 0704 | 35 | 35 | P | | ✓ | BM | |
| 8 | P-1 | TIE IN | WEOS | EEOS | " | 0645 | 0650 | 34 | 34 | P | | ✓ | BM | |
| 9 | P-2 | TIE IN | EEOS | WEOS | " | 0642 | 0647 | 35 | 35 | P | | ✓ | BM | |
| 10 | P-5 | T.I. | EEOS | WEOS | " | 0642 | 0647 | 35 | 35 | P | | ✓ | BM | |
| 11 | P-7 | T.I. | WEOS | EEOS | " | 0641 | 0646 | 33 | 33 | P | | ✓ | BM | |
| 12 | P-9 | T.I. | EEOS | 1Q | " | 0635 | 0640 | 35 | 35 | P | ✓ | | BM | |
| 13 | P-9 | T.I. | WEOS | 1Q | " | 0641 | 0645 | 33 | 33 | P | | ✓ | BM | |
| 14 | P-10 | P-13 | SEOS | NEOS | " | 0931 | 0936 | 35 | 35 | P | | ✓ | TS | |
| 15 | P-10 | P-11 | SEOS | NEOS | " | 0931 | 0936 | 35 | 35 | P | | ✓ | TS | |
| 16 | P-9 | P-11 | SEOS | NEOS | " | 0931 | 0936 | 35 | 35 | P | | ✓ | TS | |
| 17 | P-13 | P-14 | SEOS | NEOS | " | 0933 | 0938 | 35 | 35 | P | | ✓ | TS | |
| 18 | P-11 | P-14 | SEOS | NEOS | " | 0933 | 0938 | 35 | 35 | P | | ✓ | TS | |
| 19 | P-11 | P-12 | SEOS | NEOS | " | 0933 | 0938 | 35 | 35 | P | | ✓ | TS | |
| 20 | P-14 | P-17 | SEOS | NEOS | " | 1112 | 1117 | 34 | 34 | P | | ✓ | TS | |
| 21 | P-14 | P-15 | SEOS | NEOS | " | 1112 | 1117 | 34 | 34 | P | | ✓ | TS | |
| 22 | P-12 | P-15 | SEOS | NEOS | " | 1112 | 1117 | 34 | 34 | P | | ✓ | TS | |
| 23 | P-17 | P-18 | SEOS | NEOS | " | 1118 | 1123 | 33 | 33 | P | | ✓ | TS | |
| 24 | P-15 | P-16 | SEOS | NEOS | " | 1120 | 1125 | 35 | 34 | P | | ✓ | TS | |
| 25 | P-11 | P-13 | WEOS | EEOS | " | 1124 | 1129 | 35 | 35 | P | | ✓ | TS | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6-11-08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P-12 | P-14 | WEOS | WEOS | BS | 1125 | 1130 | 35 | 35 | P | | ✓ | TS | |
| 2 | P-15 | P-17 | EEOS | WEOS | BS | 1306 | 1311 | 35 | 35 | P | | ✓ | TS | |
| 3 | P-16 | P-18 | WEOS | EEOS | BS | 1307 | 1312 | 34 | 34 | P | | ✓ | TS | |
| 4 | P-19 | P-21 | WEOS | EEOS | BS | 1316 | 1321 | 35 | 35 | P | | ✓ | TS | |
| 5 | P-20 | P-22 | WEOS | EEOS | BS | 1317 | 1322 | 34 | 34 | P | | ✓ | TS | |
| 6 | P-18 | P-21 | SEOS | NEOS | BS | 1337 | 1342 | 34 | 32 | P | | ✓ | BM | |
| 7 | P-21 | P-22 | SEOS | NEOS | BS | 1338 | 1343 | 35 | 34 | P | | ✓ | BM | |
| 8 | P-18 | P-19 | SEOS | NEOS | BS | 1337 | 1342 | 34 | 32 | P | | ✓ | BM | |
| 9 | P-16 | P-19 | SEOS | NEOS | BS | 1340 | 1345 | 35 | 35 | P | | ✓ | BM | |
| 10 | P-19 | P-20 | SEOS | NEOS | BS | 1338 | 1443 | 35 | 34 | P | | ✓ | BM | |
| 11 | P-22 | P-25 | SEOS | NEOS | BS | 1454 | 1459 | 35 | 35 | P | | ✓ | BM | |
| 12 | P-20 | P-23 | SEOS | NEOS | BS | 1454 | 1459 | 35 | 35 | P | | ✓ | BM | |
| 13 | P-25 | P-26 | SEOS | NEOS | BS | 1527 | 1532 | 35 | 35 | P | | ✓ | BM | |
| 14 | P-23 | P-24 | SEOS | NEOS | BS | 1527 | 1532 | 35 | 35 | P | | ✓ | BM | |
| 15 | P-24 | P-26 | WEOS | EEOS | BS | 1529 | 1530 | 34 | 34 | P | | ✓ | BM | |
| 16 | P-23 | P-25 | WEOS | EEOS | BS | 1515 | 1520 | 35 | 35 | P | | ✓ | BM | |
| 17 | P-26 | P-28 | NEOS | SEOS | BS | 1610 | 1615 | 35 | 35 | P | | ✓ | BM | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6-12-08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P-24 | P-27 | SEOS | NEOS | BS | 0628 | 0633 | 35 | 35 | P | | ✓ | BM | |
| 2 | P-27 | P-28 | WEOS | EEOS | BS | 0629 | 0634 | 34 | 34 | P | | ✓ | BM | |
| 3 | P27 | TI | EEOS | WEOS | BS | 0645 | 0650 | 35 | 35 | P | | ✓ | BM | |
| 4 | P-24 | TI | EEOS | 2P | BS | 0645 | 0650 | 35 | 35 | P | ✓ | | BM | |
| 5 | P-24 | TI | 2P | WEOS | BS | 0654 | 0659 | 35 | 35 | P | | ✓ | BM | |
| 6 | P-23 | TI | EEOS | 2Q | BS | 0654 | 0659 | 35 | 35 | P | ✓ | | BM | |
| 7 | P-23 | TI | 2Q | WEOS | BS | 0659 | 0704 | 34 | 34 | P | | ✓ | BM | |
| 8 | P-20 | TI | EEOS | 2R | BS | 0659 | 0704 | 34 | 34 | P | ✓ | | BM | |
| 9 | P-20 | TI | 2R | WEOS | BS | 0705 | 0710 | 34 | 34 | P | | ✓ | BM | |
| 10 | P19 | TI | EEOS | 2S | BS | 0705 | 0710 | 34 | 34 | P | ✓ | | BM | |
| 11 | P-19 | TI | 2S | WEOS | BS | 0709 | 0714 | 35 | 35 | P | | ✓ | BM | |
| 12 | P-16 | TI | EEOS | 2T | BS | 0709 | 0714 | 35 | 35 | P | ✓ | | BM | |
| 13 | P-16 | TI | 2T | WEOS | BS | 0709 | 0714 | 35 | 35 | P | | ✓ | BM | |
| 14 | P-15 | TI | EEOS | 2W | BS | 0709 | 0714 | 35 | 35 | P | ✓ | | BM | |
| 15 | P-15 | TI | 2W | 2V | BS | 0712 | 0717 | 35 | 35 | P | ✓ | | BM | |
| 16 | P-15 | TI | 2V | WEOS | BS | 0717 | 0722 | 35 | 35 | P | | ✓ | BM | |
| 17 | P-12 | TI | EEOS | WEOS | BS | 0717 | 0722 | 35 | 35 | P | | ✓ | BM | |
| 18 | P-11 | TI | EEOS | WEOS | BS | 0717 | 0722 | 35 | 35 | P | | ✓ | BM | |
| 19 | P28 | 30 | SEOS | NEOS | VB | 1512 | 1517 | 35 | 35 | P | | ✓ | BM | |
| 20 | P28 | P29 | SEOS | NEOS | VB | 1512 | 1517 | 35 | 35 | P | | ✓ | BM | |
| 21 | P27 | P29 | SEOS | NEOS | VB | 1512 | 1517 | 35 | 35 | P | | ✓ | BM | |
| 22 | P29 | P30 | WEOS | EEOS | VB | 1524 | 1529 | 35 | 35 | P | | ✓ | BM | |
| 23 | P29 | P31 | SEOS | NEOS | VB | 1529 | 1534 | 35 | 35 | P | | ✓ | BM | |
| 24 | P31 | P32 | EEOS | WEOS | VB | 1537 | 1542 | 35 | 35 | P | | ✓ | BM | |
| 25 | P30 | P32 | SEOS | NEOS | VB | 1552 | 1557 | 35 | 35 | P | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6-12-08

REVIEWED BY: [signature]

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P33 | P34 | WEOS | EEOS | VB | 1553 | 1558 | 35 | 35 | P | | ✓ | BM | |
| 2 | P32 | P34 | SEOS | WEOS | VB | 1558 | 1603 | 35 | 35 | P | | ✓ | BM | |
| 3 | P31 | P33 | SEOS | WEOS | VB | 1558 | 1603 | 35 | 35 | P | | ✓ | BM | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/13/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P-35 | P36 | WEOS | EEOS | VB | 0811 | 0816 | 34 | 34 | P | | ✓ | BM | |
| 2 | P-34 | P-36 | SEOS | NEOS | VB | 0812 | 0817 | 35 | 35 | P | | ✓ | BM | |
| 3 | P 33 | P 35 | SEOS | NEOS | VB | 0812 | 0817 | 35 | 35 | P | | ✓ | BM | |
| 4 | P-37 | P 38 | WEOS | EEOS | VB | 0821 | 0826 | 33 | 33 | P | | ✓ | BM | |
| 5 | P 36 | P 38 | SEOS | NEOS | VB | 0855 | 0900 | 35 | 35 | P | | ✓ | BM | |
| 6 | P-35 | P-37 | SEOS | NEOS | VB | 0855 | 0900 | 35 | 35 | P | | ✓ | BM | |
| 7 | P 39 | P 40 | WEOS | EEOS | VB | 0904 | 0909 | 35 | 35 | P | | ✓ | BM | |
| 8 | P 41 | P 42 | WEOS | EEOS | VB | 0912 | 0917 | 36 | 34 | P | | ✓ | BM | |
| 9 | P 38 | P 40 | SEOS | NEOS | VB | 0948 | 0953 | 33 | 33 | P | | ✓ | BM | |
| 10 | P 37 | P 39 | SEOS | NEOS | VB | 0948 | 0953 | 35 | 33 | P | | ✓ | BM | |
| 11 | P 40 | P 42 | SEOS | NEOS | VB | 1015 | 1020 | 35 | 35 | P | | ✓ | BM | |
| 12 | P 39 | P 41 | SEOS | NEOS | VB | 1015 | 1020 | 35 | 35 | P | | ✓ | BM | |
| 13 | P 42 | 44 | SEOS | NEOS | VB | 1329 | 1334 | 35 | 34 | P | | ✓ | BM | |
| 14 | P 43 | P 44 | WEOS | EEOS | VB | 1331 | 1336 | 32 | 32 | P | | ✓ | BM | |
| 15 | P 41 | P 43 | SEOS | NEOS | VB | 1330 | 1335 | 30 | 30 | P | | ✓ | BM | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/14/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 43 | 45 | NEOS | SEOS | BS | 0951 | 0956 | 34 | 33 | P | | ✓ | BM | |
| 2 | 51 | 52 | WEOS | EEOS | BS | 0955 | 1000 | 35 | 34 | P | | ✓ | BM | |
| 3 | 58 | 59 | WEOS | EEOS | BS | 1002 | 1007 | 34 | 34 | P | | ✓ | BM | |
| 4 | 57 | 59 | WEOS | EEOS | BS | 1002 | 1007 | 34 | 34 | P | | ✓ | BM | |
| 5 | 51 | 53 | WEOS | EEOS | BS | 0955 | 1000 | 35 | 34 | P | | ✓ | BM | |
| 6 | 43 | 47 | NEOS | SEOS | BS | 0951 | 956 | 34 | 33 | P | | ✓ | BM | |
| 7 | 43 | 51 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | ✓ | BM | |
| 8 | 43 | 52 | | | | | | | | | | ✓ | BM | |
| 9 | 43 | 54 | | | | | | | | | | ✓ | BM | |
| 10 | 43 | 55 | | | | | | | | | | ✓ | BM | |
| 11 | 43 | 58 | | | | | | | | | | ✓ | BM | |
| 12 | 43 | 59 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | ✓ | BM | |
| 13 | 43 | 60 | NEOS | 6K | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ✓ | | BM | see 6/16/08 |
| 14 | 45 | 46 | WEOS | EEOS | BS | 1038 | 1043 | 35 | 34 | P | | ✓ | BM | |
| 15 | 45 | 48 | WEOS | EEOS | BS | 1040 | 1045 | 35 | 34 | P | | ✓ | BM | |
| 16 | 45 | 49 | WEOS | EEOS | BS | 1046 | 1051 | 35 | 35 | P | | ✓ | BM | |
| 17 | 50 | 49 | WEOS | EEOS | BS | 1043 | 1048 | 35 | 35 | P | | ✓ | BM | |
| 18 | 46 | 49 | SEOS | NEOS | BS | 1045 | 1050 | 34 | 34 | P | | ✓ | BM | |
| 19 | 48 | 51 | WEOS | EEOS | BS | 1018 | 1023 | 35 | 35 | P | | ✓ | BM | |
| 20 | 53 | 54 | WEOS | EEOS | BS | 1020 | 1025 | 35 | 35 | P | | ✓ | BM | |
| 21 | 45 | 47 | WEOS | EEOS | BS | 1017 | 1022 | 35 | 35 | P | | ✓ | BM | |
| 22 | 47 | 51 | WEOS | EOS | BS | 1018 | 1023 | 35 | 35 | P | | ✓ | BM | |
| 23 | 52 | 54 | WEOS | EEOS | BS | 1020 | 1025 | 35 | 35 | P | | ✓ | BM | |
| 24 | 55 | 56 | NEOS | SEOS | BS | 1113 | 1118 | 33 | 33 | P | | ✓ | BM | |
| 25 | 52 | 53 | NEOS | SEOS | BS | 1110 | 1115 | 35 | 35 | P | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/14/08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 OF 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 47 | 48 | NEOS | SEOS | BS | 1058 | 1103 | 34 | 34 | P | | ✓ | BM | |
| 2 | 54 | 56 | WEOS | EEOS | BS | 1112 | 1117 | 35 | 35 | P | | ✓ | BM | |
| 3 | 54 | 55 | WEOS | EEOS | BS | 1119 | 1124 | 34 | 32 | P | | ✓ | BM | |
| 4 | 55 | 58 | WEOS | EEOS | ↓ | 1120 | 1125 | 35 | 35 | P | | ✓ | BM | |
| 5 | 55 | 57 | WEOS | EEOS | ↓ | 1122 | 1127 | 33 | 33 | P | | ✓ | BM | |
| 6 | 56 | 57 | WEOS | EEOS | ↓ | 1114 | 1119 | 35 | 34 | P | | ✓ | BM | |
| 7 | 68 | 69 | WEOS | EEOS | ↓ | 1117 | 1122 | 35 | 34 | P | | ✓ | BM | |
| 8 | 70 | 71 | WEOS | EEOS | ↓ | 118 | 1123 | 35 | 35 | P | | ✓ | BM | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/16/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P59 | P60 | WEOS | EEOS | BS | 0625 | 0630 | 35 | 35 | P | | ✓ | LF | |
| 2 | P59 | P61 | WEOS | EEOS | " | 0625 | 0630 | 35 | 35 | P | | ✓ | LF | |
| 3 | P43 | P60 | 6K | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 4 | P60 | P62 | WEOS | EEOS | " | 0640 | 0645 | 34 | 34 | P | | ✓ | LF | |
| 5 | P61 | P62 | WEOS | EEOS | " | 0640 | 0645 | 34 | 34 | P | | ✓ | LF | |
| 6 | P62 | P66 | WEOS | EEOS | " | 0641 | 0646 | 34 | 34 | P | | ✓ | LF | |
| 7 | P62 | P63 | WEOS | EEOS | " | 0646 | 0651 | 34 | 34 | P | | ✓ | LF | |
| 8 | P64 | P66 | WEOS | EEOS | " | 0642 | 0647 | 34 | 34 | P | | ✓ | LF | |
| 9 | P63 | P64 | WEOS | EEOS | " | 0642 | 0647 | 34 | 34 | P | | ✓ | LF | |
| 10 | P64 | P67 | WEOS | EEOS | " | 0643 | 0648 | 34 | 34 | P | | ✓ | LF | |
| 11 | P64 | P65 | WEOS | EEOS | " | 0643 | 0648 | 34 | 34 | P | | ✓ | LF | |
| 12 | P69 | P70 | WEOS | EEOS | " | 0715 | 0720 | 35 | 35 | P | | ✓ | LF | |
| 13 | P70 | P71 | WEOS | EEOS | " | 0715 | 0720 | 35 | 35 | P | | ✓ | LF | |
| 14 | P71 | P72 | WEOS | EEOS | " | 0716 | 0721 | 35 | 34 | P | | ✓ | LF | |
| 15 | P72 | P73 | WEOS | EEOS | " | 0717 | 0722 | 35 | 34 | P | | ✓ | LF | |
| 16 | P73 | P74 | WEOS | EEOS | " | 0718 | 0723 | 35 | 35 | P | | ✓ | LF | |
| 17 | P74 | P75 | WEOS | EEOS | " | 0726 | 0731 | 34 | 34 | P | | ✓ | LF | |
| 18 | P67 | P68 | WEOS | EEOS | " | 0738 | 0743 | 34 | 34 | P | | ✓ | LF | |
| 19 | P65 | P68 | WEOS | EEOS | " | 0746 | 0751 | 35 | 34 | P | | ✓ | LF | |
| 20 | P65 | P67 | SEOS | NEOS | " | 0753 | 0758 | 35 | 34 | P | | ✓ | LF | |
| 21 | P63 | P66 | SEOS | NEOS | " | 0756 | 0801 | 32 | 32 | P | | ✓ | LF | |
| 22 | P57 | P58 | SEOS | 5X | " | 0800 | 0805 | 33 | 33 | P | ✓ | | LF | ok 2 |
| 23 | P60 | P61 | NEOS | SEOS | " | 0802 | 0807 | 34 | 34 | P | | ✓ | LF | |
| 24 | P57 | 58 | 5X | NEOS | — | COVERED | BY | 5V | | — | | ✓ | LF | Capped by SV |
| 25 | P75 | P76 | NEOS | SEOS | " | 0814 | 0819 | 34 | 34 | P | | ✓ | LF | |
| | P74 | P76 | WEOS | EEOS | " | 0813 | 0818 | 32 | 32 | P | | ✓ | LF | |

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/16/08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | P-1 | P-77 | SEOS | NEOS | VB | 0952 | 0957 | 34 | 32 | P | | ✓ | BM | |
| 2 | 77 | 79 | EEOS | NEOS | VB | 0955 | 1000 | 34 | 34 | P | | ✓ | BM | |
| 3 | 3 | 79 | NEOS | SEOS | VB | 1006 | 1011 | 30 | 30 | P | | ✓ | BM | |
| 4 | 79 | 80 | NEOS | SEOS | VB | 1018 | 1023 | 36 | 36 | P | | ✓ | BM | |
| 5 | 78 | 77 | SEOS | NEOS | VB | 1019 | 1024 | 36 | 36 | P | | ✓ | BM | |
| 6 | 78 | 80 | EEOS | WEOS | VB | 1020 | 1025 | 31 | 31 | P | | ✓ | BM | |
| 7 | 80 | 83 | SEOS | NEOS | VB | 1054 | 1059 | 36 | 35 | P | | ✓ | BM | |
| 8 | 78 | 81 | SEOS | NEOS | VB | 1100 | 1105 | 34 | 33 | P | | ✓ | BM | |
| 9 | 81 | 83 | EEOS | WEOS | VB | 1111 | 1116 | 35 | 34 | P | | ✓ | BM | |
| 10 | 84 | 83 | SEOS | NEOS | VB | 1110 | 1115 | 38 | 38 | P | | ✓ | BM | |
| 11 | 82 | 81 | SEOS | NEOS | VB | 1110 | 1115 | 38 | 38 | P | | ✓ | BM | |
| 12 | 44 | 74 | " | " | BS | 0626 | 0631 | 35 | 35 | P | | ✓ | BM | |
| 13 | 44 | 75 | SEOS | NEOS | BS | 0626 | 0631 | 35 | 35 | P | | ✓ | BM | |
| 14 | P43 | P62 | NEOS | SEOS | BS | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 15 | P-43 | P66 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 16 | P-43 | P64 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 17 | P-43 | P67 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 18 | P-43 | P68 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 19 | P-43 | P69 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 20 | P-43 | P70 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 21 | P-43 | P71 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 22 | P-43 | P72 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
| 23 | P-43 | P73 | NEOS | SEOS | " | 0626 | 0631 | 35 | 35 | P | | ✓ | LF | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/17/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 82 | 84 | Neos | Seos | VB | 0804 | 0809 | 35 | 35 | P | | ✓ | BM | |
| 2 | 82 | 85 | Seos | Neos | VB | 0800 | 0805 | 35 | 35 | P | | ✓ | BM | |
| 3 | 84 | 86 | Seos | Neos | VB | 0729 | 0734 | 35 | 35 | P | | ✓ | BM | |
| 4 | 85 | 86 | SEOS | NEOS | VB | 0802 | 0807 | 36 | 36 | P | | ✓ | BM | |
| 5 | 85 | 87 | Seos | Neos | VB | 0801 | 0806 | 35 | 35 | P | | ✓ | BM | |
| 6 | 86 | 87 | Neos | Seos | VB | 0805 | 0810 | 35 | 34 | P | | ✓ | BM | |
| 7 | 86 | 89 | Neos | Seos | VB | 0805 | 0810 | 35 | 34 | P | | ✓ | BM | |
| 8 | P-86 | P-90 | SEOS | NEOS | VB | 0805 | 0810 | 35 | 35 | P | | ✓ | BM | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/18/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 89 | 91 | SEOS | NEOS | VB | 1502 | 1507 | 38 | 38 | P | | ✓ | BM | |
| 2 | 87 | 88 | SEOS | NEOS | VB | 1503 | 1508 | 38 | 36 | P | | ✓ | BM | |
| 3 | 87 | 91 | SEOS | NEOS | VB | 1502 | 1507 | 38 | 38 | P | | ✓ | BM | |
| 4 | 91 | 94 | SEOS | NEOS | VB | 1525 | 1530 | 37 | 37 | P | | ✓ | BM | |
| 5 | 91 | 92 | SEOS | NEOS | VB | 1525 | 1530 | 37 | 37 | P | | ✓ | BM | |
| 6 | 88 | 92 | SEOS | NEOS | VB | 1525 | 1530 | 37 | 37 | P | | ✓ | BM | |
| 7 | 94 | 95 | SEOS | NEOS | ~~VB~~ BS | 1536 | 1541 | 35 | 35 | P | | ✓ | BM | |
| 8 | 92 | 93 | SEOS | NEOS | BS | 1536 | 1541 | 35 | 35 | P | | ✓ | BM | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/19/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 4

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 98 | 99 | SEOS | NEOS | BS | 0813 | 0818 | 34 | 34 | P | | ✓ | BM | |
| 2 | 96 | 97 | SEOS | NEOS | BS | 0813 | 0818 | 34 | 34 | P | | ✓ | BM | |
| 3 | 99 | 101 | SEOS | NEOS | BS | 0815 | 0820 | 32 | 32 | P | | ✓ | BM | |
| 4 | 97 | 100 | SEOS | NEOS | BS | 0815 | 0820 | 32 | 32 | P | | ✓ | BM | |
| 5 | 101 | 103 | SEOS | NEOS | BS | 0838 | 0843 | 35 | 35 | P | | ✓ | BM | |
| 6 | 100 | 102 | SEOS | NEOS | BS | 0840 | 0845 | 35 | 35 | P | | ✓ | BM | |
| 7 | 107 | 109 | SEOS | NEOS | BS | 0837 | 0842 | 35 | 34 | P | | ✓ | BM | |
| 8 | 105 | 108 | SEOS | NEOS | BS | 0837 | 0842 | 35 | 34 | P | | ✓ | BM | |
| 9 | 102 | 104 | SEOS | NEOS | BS | 0901 | 0906 | 33 | 32 | P | | ✓ | BM | |
| 10 | 104 | 105 | SEOS | NEOS | BS | 0902 | 0907 | 35 | 35 | P | | ✓ | BM | |
| 11 | 109 | 117 | SEOS | NEOS | BS | 0903 | 0908 | 34 | 33 | P | | ✓ | BM | |
| 12 | 108 | 117 | SEOS | NEOS | BS | 0903 | 0908 | 34 | 33 | P | | ✓ | BM | |
| 13 | 117 | 118 | SEOS | NEOS | BS | 0904 | 0909 | 35 | 35 | P | | ✓ | BM | |
| 14 | 118 | 119 | SEOS | NEOS | BS | 0906 | 0911 | 34 | 34 | P | | ✓ | BM | |
| 15 | 108 | 109 | EEOS | WEOS | BS | 0911 | 0916 | 35 | 35 | P | | ✓ | BM | |
| 16 | 103 | 106 | SEOS | NEOS | BS | 0912 | 0917 | 35 | 35 | P | | ✓ | BM | |
| 17 | 106 | 107 | SEOS | NEOS | BS | 0913 | 0918 | 32 | 32 | P | | ✓ | BM | |
| 18 | 90 | 91 | NEOS | SEOS | BS | 0925 | 0930 | 35 | 35 | P | | ✓ | BM | |
| 19 | 89 | 90 | WEOS | EEOS | BS | 0925 | 0930 | 35 | 35 | P | | ✓ | BM | |
| 20 | 87 | 89 | WEOS | EEOS | BS | 0930 | 0935 | 34 | 34 | P | | ✓ | BM | |
| 21 | 88 | 91 | EEOS | WEOS | BS | 0929 | 0934 | 33 | 33 | P | | ✓ | BM | |
| 22 | 92 | 94 | WEOS | EEOS | BS | 0931 | 0936 | 35 | 35 | P | | ✓ | BM | |
| 23 | 93 | 95 | EEOS | WEOS | BS | 0932 | 0937 | 34 | 34 | P | | ✓ | BM | |
| 24 | 96 | 98 | EEOS | WEOS | BS | 0951 | 0956 | 35 | 35 | P | | ✓ | BM | |
| 25 | 97 | 99 | WEOS | EEOS | BS | 0944 | 0949 | 34 | 34 | P | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/19/08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 OF 4

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 100 | 101 | EEOS | WEOS | BS | 0950 | 0955 | 35 | 34 | P | | ✓ | BM | |
| 2 | 102 | 103 | WEOS | EEOS | BS | 0953 | 0958 | 35 | 34 | P | | ✓ | BM | |
| 3 | 104 | 106 | EEOS | WEOS | BS | 0954 | 0959 | 35 | 34 | P | | ✓ | BM | |
| 4 | 105 | 107 | EEOS | WEOS | BS | 0955 | 1000 | 35 | 34 | P | | ✓ | BM | |
| 5 | 129 | 130 | EEOS | WEOS | BS | 1024 | 1029 | 35 | 34 | P | | ✓ | BM | |
| 6 | 132 | 130 | EEOS | WEOS | BS | 1025 | 1030 | 35 | 34 | P | | ✓ | BM | |
| 7 | 132 | 133 | EEOS | WEOS | BS | 1026 | 1031 | 35 | 35 | P | | ✓ | BM | |
| 8 | 133 | 135 | EEOS | WEOS | BS | 1028 | 1033 | 35 | 34 | P | | ✓ | BM | |
| 9 | 129 | 131 | NEOS | SEOS | BS | 1045 | 1050 | 35 | 35 | P | | ✓ | BM | |
| 10 | 112 | 131 | WEOS | EEOS | BS | 1047 | 1052 | 34 | 34 | P | | ✓ | BM | |
| 11 | 112 | 129 | EEOS | WEOS | BS | 1447 | 1452 | 35 | 34 | P | | ✓ | BM | |
| 12 | 113 | 129 | EEOS | WEOS | BS | 1450 | 1455 | 35 | 33 | P | | ✓ | BM | |
| 13 | 130 | 131 | EEOS | WEOS | BS | 1049 | 1054 | 34 | 34 | P | | ✓ | BM | |
| 14 | 95 | 98 | SEOS | NEOS | BS | 1250 | 1255 | 35 | 35 | P | | ✓ | BM | |
| 15 | 93 | 96 | SEOS | NEOS | BS | 1259 | 1304 | 35 | 33 | P | | ✓ | BM | |
| 16 | 137 | 138 | NEOS | SEOS | BS | 1311 | 1316 | 35 | 35 | P | | ✓ | BM | |
| 17 | 133 | 138 | WEOS | EEOS | BS | 1312 | 1317 | 35 | 35 | P | | ✓ | BM | |
| 18 | 133 | 137 | EEOS | WEOS | BS | 1313 | 1318 | 34 | 34 | P | | ✓ | BM | |
| 19 | 134 | 137 | NEOS | SEOS | BS | 1314 | 1319 | 35 | 34 | P | | ✓ | BM | |
| 20 | 133 | 134 | EEOS | WEOS | BS | 1315 | 1320 | 35 | 35 | P | | ✓ | BM | |
| 21 | 134 | 135 | NEOS | SEOS | BS | 1317 | 1322 | 34 | 34 | P | | ✓ | BM | |
| 22 | 124 | 134 | NEOS | SEOS | BS | 1339 | 1344 | 35 | 35 | P | | ✓ | BM | |
| 23 | 124 | 136 | EEOS | WEOS | BS | 1341 | 1346 | 35 | 34 | P | | ✓ | BM | |
| 24 | 124 | 135 | EEOS | WEOS | BS | 1341 | 1346 | 35 | 34 | P | | ✓ | BM | |
| 25 | 124 | 125 | EEOS | WEOS | BS | 1343 | 1348 | 35 | 33 | P | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/19

REVIEWED BY: [illegible]

SHEET NUMBER: 3 OF 4

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 125 | 126 | Eeos | Weos | BS | 1344 | 1349 | 35 | 35 | P | | ✓ | BM | |
| 2 | 126 | 127 | Eeos | Weos | BS | 1445 | 1450 | 34 | 33 | P | | ✓ | BM | |
| 3 | 123 | 127 | Eeos | Weos | BS | 1350 | 1355 | 35 | 35 | P | | ✓ | BM | |
| 4 | 122 | 123 | Eeos | Weos | BS | 1347 | 1352 | 32 | 32 | P | | ✓ | BM | |
| 5 | 134 | 136 | EEOS | Weos | BS | 1317 | 1322 | 34 | 34 | P | | ✓ | BM | |
| 6 | 125 | 135 | Seos | Weos | BS | 1341 | 1346 | 35 | 34 | P | | ✓ | BM | |
| 7 | 126 | 133 | Seos | Neos | BS | 1341 | 1346 | 35 | 34 | P | | ✓ | BM | |
| 8 | 127 | 133 | Seos | Neos | BS | 1341 | 1346 | 35 | 34 | ✓ P | | ✓ | BM | |
| 9 | 127 | 132 | Seos | Neos | BS | 1341 | 1346 | 35 | 34 | ✓ P | | ✓ | BM | |
| 10 | 123 | 132 | Seos | Neos | BS | 1341 | 1346 | 35 | 34 | ✓ P | | ✓ | BM | |
| 11 | 135 | 136 | Weos | Eeos | BS | 1400 | 1405 | 35 | 35 | ✓ P | | ✓ | BM | |
| 12 | 122 | 132 | SEOS | NEOS | BS | 1414 | 1419 | 34 | 32 | P | | ✓ | BM | |
| 13 | 122 | 130 | Seos | Neos | BS | 1414 | 1419 | 34 | 32 | P | | ✓ | BM | |
| 14 | 121 | 130 | Seos | Neos | BS | 1414 | 1419 | 34 | 32 | P | | ✓ | BM | |
| 15 | 121 | 122 | Eeos | Weos | BS | 1413 | 1418 | 34 | 32 | P | | ✓ | BM | |
| 16 | 120 | 121 | Eeos | Weos | BS | 1415 | 1420 | 35 | 35 | P | | ✓ | BM | |
| 17 | 121 | 129 | Seos | Neos | BS | 1414 | 1419 | 34 | 33 | P | | ✓ | BM | |
| 18 | 120 | 129 | Seos | Neos | BS | 1414 | 1419 | 34 | 33 | P | | ✓ | BM | |
| 19 | 113 | 120 | Seos | Neos | BS | 1430 | 1435 | 31 | 31 | P | | ✓ | BM | |
| 20 | 114 | 120 | EEOS | Weos | BS | 1416 | 1421 | 34 | 34 | P | | ✓ | BM | |
| 21 | 114 | 115 | Eeos | Weos | BS | 1419 | 1423 | 34 | 34 | P | | ✓ | BM | |
| 22 | 115 | 116 | EEOS | Weos | BS | 1419 | 1424 | 35 | 35 | P | | ✓ | BM | |
| 23 | 114 | 113 | Seos | Neos | BS | 1433 | 1438 | 32 | 32 | P | | ✓ | BM | |
| 24 | 115 | 111 | Seos | Neos | BS | 1434 | 1439 | 33 | 32 | P | | ✓ | BM | |
| 25 | 116 | 110 | Eeos | Weos | BS | 1443 | 1448 | 35 | 35 | P | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/19/08

REVIEWED BY:

SHEET NUMBER: 4 of 4

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 110 | 111 | Weos | EEOS | BS | 1444 | 1449 | 35 | 35 | P | | ✓ | BM | |
| 2 | 138 | 152 | Weos | EEOS | BS | 1552 | 1557 | 32 | 32 | P | | ✓ | BM | |
| 3 | 140 | 152 | SEOS | NEOS | BS | 1553 | 1558 | 34 | 34 | P | | ✓ | BM | |
| 4 | 138 | 140 | WEOS | 15F | BS | 1556 | 1601 | 32 | 32 | P | ✓ | | BM | |
| 5 | 138 | 140 | 15F | EEOS | BS | 1559 | 1604 | 32 | 32 | P | | ✓ | BM | |
| 6 | 113 | 114 | NEOS | SEOS | BS | 1431 | 1436 | 34 | 33 | P | | ✓ | BM | |
| 7 | | | | | | | | | | | | | | |
| 8 | 111 | 113 | WEOS | EEOS | BS | 1436 | 1441 | 35 | 35 | P | | ✓ | BM | |
| 9 | | | | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/20/09

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 143 | 144 | EEOS | WEOS | BS | 0637 | 0642 | 34 | 34 | P | | ✓ | BM | |
| 2 | 144 | 145 | EEOS | WEOS | BS | 0639 | 0644 | 34 | 34 | P | | ✓ | BM | |
| 3 | 145 | 146 | EEOS | WEOS | BS | 0640 | 0645 | 35 | 35 | P | | ✓ | BM | |
| 4 | 146 | 147 | EEOS | WEOS | BS | 0641 | 0646 | 34 | 34 | P | | ✓ | BM | |
| 5 | 147 | 148 | EEOS | WEOS | BS | 0642 | 0647 | 34 | 34 | P | | ✓ | BM | |
| 6 | 148 | 149 | EEOS | WEOS | BS | 0644 | 0649 | 34 | 34 | P | | ✓ | BM | |
| 7 | 149 | 150 | EEOS | WEOS | BS | 0645 | 0650 | 35 | 35 | P | | ✓ | BM | |
| 8 | 150 | 151 | EEOS | WEOS | BS | 0646 | 0651 | 35 | 35 | P | | ✓ | BM | |
| 9 | 142 | 143 | NEOS | SEOS | BS | 0703 | 0708 | 33 | 33 | P | | ✓ | BM | |
| 10 | 142 | 144 | SEOS | NEOS | BS | 0704 | 0709 | 36 | 36 | P | | ✓ | BM | |
| 11 | 141 | 144 | SEOS | NEOS | BS | 0706 | 0711 | 34 | 34 | P | | ✓ | BM | |
| 12 | 141 | 142 | WEOS | EEOS | BS | 0705 | 0710 | 34 | 34 | P | | ✓ | BM | |
| 13 | 139 | 142 | NEOS | SEOS | BS | 0708 | 0713 | 35 | 35 | P | | ✓ | BM | |
| 14 | 139 | 139 | SEOS | NEOS | BS | 0711 | 0716 | 35 | 35 | P | | ✓ | BM | |
| 15 | 139 | 141 | SEOS | NEOS | BS | 0721 | 0726 | 34 | 34 | P | | ✓ | BM | |
| 16 | 141 | 145 | NEOS | SEOS | BS | 0722 | 0727 | 33 | 33 | P | | ✓ | BM | |
| 17 | 141 | 146 | SEOS | NEOS | BS | 0723 | 0728 | 33 | 33 | P | | ✓ | BM | |
| 18 | 141 | 147 | NEOS | SEOS | BS | 0730 | 0735 | 34 | 34 | P | | ✓ | BM | |
| 19 | 140 | 147 | SEOS | NEOS | BS | 0727 | 0732 | 35 | 35 | P | | ✓ | BM | |
| 20 | 140 | 141 | WEOS | EEOS | BS | 0731 | 0736 | 34 | 34 | P | | ✓ | BM | |
| 21 | 140 | 148 | SEOS | NEOS | BS | 0733 | 0738 | 34 | 34 | P | | ✓ | BM | |
| 22 | 139 | 140 | SEOS | NEOS | BS | 0734 | 0739 | 33 | 33 | P | | ✓ | BM | |
| 23 | 140 | 149 | NEOS | SEOS | BS | 0746 | 0751 | 34 | 34 | P | | ✓ | BM | |
| 24 | 140 | 150 | SEOS | NEOS | BS | 0747 | 0752 | 34 | 34 | P | | ✓ | BM | |
| 25 | 140 | 151 | NEOS | SEOS | BS | 0749 | 0754 | 34 | 34 | P | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 6/20/08

REVIEWED BY:

SHEET NUMBER: 2 OF 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | DURATION | | PRESSURE | | RESULTS PASS OR FAIL | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | START TIME | FINISH TIME | INITIAL PRESSURE | FINAL PRESSURE | | NO | YES | | |
| 1 | 151 | 152 | Weos | Eeos | BS | 0750 | 0755 | 34 | 33 | P | | ✓ | BM | |
| 2 | 138 | 151 | Eeos | Weos | BS | 0758 | 0803 | 32 | 32 | P | | ✓ | BM | |
| 3 | 138 | 150 | Eeos | Weos | BS | 0754 | 0759 | 34 | 33 | P | | ✓ | BM | |
| 4 | 123 | 128 | Weos | Eeos | BS | 0805 | 0810 | 34 | 34 | P | | ✓ | BM | |
| 5 | 127 | 128 | Weos | Eeos | BS | 0806 | 0811 | 34 | 34 | P | | ✓ | BM | |
| 6 | 138 | 139 | Eeos | Weos | BS | 0812 | 0817 | 34 | 34 | P | | ✓ | BM | |
| 7 | 119 | 138 | Seos | Neos | BS | 0814 | 0819 | 32 | 32 | P | | ✓ | BM | |
| 8 | 119 | 133 | Seos | Neos | BS | 0814 | 0819 | 32 | 32 | P | | ✓ | BM | |
| 9 | 119 | 132 | Seos | Neos | BS | 0814 | 0819 | 32 | 32 | P | | ✓ | BM | |
| 10 | 119 | 130 | Seos | Neos | BS | 0814 | 0819 | 32 | 32 | P | | ✓ | BM | |
| 11 | 119 | 131 | Seos | Neos | BS | 0814 | 0819 | 32 | 32 | P | | ✓ | BM | |
| 12 | 112 | 119 | 12K | Weos | BS | 0818 | 0823 | 33 | 33 | P | ✓ | | BM | |
| 13 | 112 | 119 | 12K | Eeos | BS | 0819 | 0824 | 35 | 35 | P | | ✓ | BM | |
| 14 | 112 | 118 | Eeos | Weos | BS | 0827 | 0832 | 32 | 32 | P | | ✓ | BM | |
| 15 | 112 | 117 | Weos | Eeos | BS | 0831 | 0836 | 32 | 32 | P | | ✓ | BM | |
| 16 | 108 | 112 | Neos | Seos | BS | 0833 | 0838 | 35 | 35 | P | | ✓ | BM | |
| 17 | 108 | 111 | Seos | Neos | BS | 0834 | 0839 | 34 | 34 | P | | ✓ | BM | |
| 18 | 108 | 110 | Seos | Neos | BS | 0835 | 0840 | 34 | 34 | P | | ✓ | BM | |
| 19 | 111 | 112 | Weos | Eeos | BS | 0848 | 0853 | 35 | 35 | P | | ✓ | BM | |
| 20 | 112 | 113 | Neos | Weos | BS | 0851 | 0856 | 33 | 33 | P | | ✓ | BM | |
| 21 | | | | | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX M

## Vacuum Testing Logs

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/12/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 OF 2

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 1D | SR | NO | YES | LF | |
| 2 | 1B | " | " | " | LF | DS-2 |
| 3 | 1E | " | " | " | LF | 1E |
| 4 | 1F | " | " | " | LF | |
| 5 | 1G | " | " | " | LF | |
| 6 | 1J | " | " | " | LF | |
| 7 | 2D | " | " | " | LF | |
| 8 | 2C | " | " | " | LF | |
| 9 | 2F | " | " | " | LF | |
| 10 | 2A | " | " | " | LF | |
| 11 | 2B | " | " | " | LF | |
| 12 | 1H | " | " | " | LF | DS-4 |
| 13 | 2G | " | " | " | LF | |
| 14 | 2H/2I | " | " | " | LF | 1 PATCH |
| 15 | 2J | " | " | " | LF | |
| 16 | 2K | " | " | " | LF | |
| 17 | 2M | " | " | " | LF | |
| 18 | 2N | " | " | " | LF | |
| 19 | 3E | " | " | " | LF | DS-14 |
| 20 | 4A | " | " | " | LF | DX-2 |
| 21 | 3A | " | " | " | LF | DS-10 |
| 22 | 1S | " | " | " | LF | DS-9 |
| 23 | 1N | " | " | " | LF | DS-8 |
| 24 | 3C | " | " | " | LF | DS-12 |
| 25 | 1K | " | " | " | LF | DS-6 |

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 26 | 3D | SR | NO | YES | LF | DS-13 |
| 27 | 3B | " | " | " | LF | DS-11 |
| 28 | 1M | " | " | " | LF | DS-7 |
| 29 | 1I | " | " | " | LF | DS-5 |
| 30 | 1C | " | " | " | LF | DS-3 |
| 31 | 1A | " | " | " | LF | DS-1 |
| 32 | 1P | " | " | " | LF | DX-1 |
| 33 | 1V | " | " | " | LF | |
| 34 | 1X | " | " | " | LF | |
| 35 | 1T | " | " | " | LF | |
| 36 | 1W | " | " | " | LF | |
| 37 | 1Q | " | " | " | LF | |
| 38 | 1R | " | " | " | LF | |
| 39 | 4G | " | " | " | LF | |
| 40 | 3F | " | " | " | LF | DS-15 |
| 41 | 2X | " | " | " | LF | |
| 42 | 2V | " | " | " | LF | |
| 43 | 2W | " | " | " | LF | |
| 44 | 4F | " | " | " | LF | |
| 45 | 2T | " | " | " | LF | |
| 46 | 4D | " | " | " | LF | |
| 47 | 2S | " | " | " | LF | |
| 48 | 4C | " | " | " | LF | |
| 49 | 2R | " | " | " | LF | |
| 50 | 4E | " | " | " | LF | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/12/08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 OF 2

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 2Q | SR | NO | YES | LF | |
| 2 | 2P | " | " | " | LF | |
| 3 | 4B | " | " | " | LF | |
| 4 | 3H | TS | " | " | LF | |
| 5 | 3I | " | " | " | LF | |
| 6 | 3M | " | " | " | LF | |
| 7 | 3N | " | " | " | LF | |
| 8 | 3P | " | " | " | LF | |
| 9 | 3Q | " | " | " | LF | |
| 10 | 4I | " | " | " | BM | |
| 11 | | | | | | |
| 12 | | | | | | |
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| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/12/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | OBSERVED DEFECTS | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | NO | YES | | |
| 1 | TIE-IN | P-29 | WEOS | 3I | IS | NO | ✓ | — | LF | |
| 2 | Tie In | P-29 | 3I | EEOS | " | " | — | ✓ | LF | |
| 3 | Tie In | P-31 | WEOS | 3N | " | " | ✓ | — | LF | |
| 4 | Tie In | P-31 | 3N | EEOS | " | " | — | ✓ | LF | |
| 5 | Tie In | P33 | WEOS | 3Q | " | " | ✓ | — | LF | |
| 6 | Tie In | P-33 | 3Q | EEOS | " | " | — | ✓ | LF | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/14/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 6M | MB | NO | YES | LF | |
| 2 | 6N | " | " | " | LF | |
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| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
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| 26 | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6-20-08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 5

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 4H | VT SR | yes | yes | BM | |
| 2 | 4I | VT SR | yes | yes | BM | 6/12 |
| 3 | 4J | SR | yes | y | BM | |
| 4 | 4K | SR | yes | y | BM | |
| 5 | 3R | SR | yes | y | BM | 3R DS-19 |
| 6 | 3K | SR | yes | y | BM | DS-18 |
| 7 | 3T | SR | yes | y | BM | DS-21 |
| 8 | 10X | SR | yes | y | BM | DX-5A1 |
| 9 | 4M | SR | yes | y | BM | |
| 10 | 4P | SR | yes | y | BM | |
| 11 | 4N | SR | yes | y | BM | |
| 12 | 4P | SR | yes | y | BM | |
| 13 | 10W | SR | yes | y | BM | DX-5B1 |
| 14 | 4Q | SR | yes | y | BM | |
| 15 | 5C/12M | SR | y | y | BM | 5C DS-23/DX5 |
| 16 | 8Q | SR | y | y | BM | |
| 17 | 8P | SR | y | y | BM | |
| 18 | 8R | SR | y | y | BM | |
| 19 | 8N | SR | y | y | BM | |
| 20 | 8M | SR | y | y | BM | |
| 21 | 8K | SR | y | y | BM | |
| 22 | 8J | SR | y | y | BM | |
| 23 | 8I | SR | y | y | BM | |
| 24 | 8C | SR | y | y | BM | DS-32 |
| 25 | 8H | SR | y | y | BM | |

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 26 | 8A | SR | Y | Y | BM | DS-31 |
| 27 | 8B | SR | Y | Y | BM | 1 |
| 28 | 7W | SR | Y | Y | BM | |
| 29 | 7X | SR | Y | Y | BM | DS-30 |
| 30 | 7S | SR | Y | Y | BM | |
| 31 | 7Q | SR | Y | Y | BM | |
| 32 | 7R | SR | Y | Y | BM | |
| 33 | 8G | SR | Y | Y | BM | |
| 34 | 8F | SR | Y | Y | BM | |
| 35 | 8E | SR | Y | Y | BM | |
| 36 | 8D | SR | Y | Y | BM | |
| 37 | 6K | SR | Y | Y | BM | |
| 38 | 6J | SR | Y | Y | BM | |
| 39 | 6I | SR | Y | Y | BM | |
| 40 | 5W | SR | Y | Y | BM | |
| 41 | 5X | SR | Y | Y | BM | |
| 42 | 5V | SR | Y | Y | BM | |
| 43 | 6H | SR | Y | Y | BM | |
| 44 | 6G | SR | Y | Y | BM | |
| 45 | 6F | SR | Y | Y | BM | |
| 46 | 6E | SR | Y | Y | BM | |
| 47 | 6D | SR | Y | Y | BM | |
| 48 | 6C | SR | Y | Y | BM | |
| 49 | 6B | SR | Y | Y | BM | |
| 50 | 7B | SR | Y | Y | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/20/08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 5

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 7E | SR | Yes | Yes | BM | |
| 2 | 7G | SR | Y | Y | BM | |
| 3 | 7H | SR | Y | Y | BM | |
| 4 | 7I | SR | Y | Y | BM | |
| 5 | 7J | SR | Y | Y | BM | |
| 6 | 5M | SR | Y | Y | BM | DS-24 |
| 7 | 7K | SR | Y | Y | BM | |
| 8 | 7M | SR | Y | Y | BM | |
| 9 | 7N | SR | Y | Y | BM | |
| 10 | 4S | SR | Y | Y | BM | |
| 11 | 7T | SR | Y | Y | BM | DX-4 |
| 12 | 7V | SR | Y | Y | BM | |
| 13 | 4R | SR | Y | Y | BM | |
| 14 | 5K | SR | Y | Y | BM | |
| 15 | 4T | SR | Y | Y | BM | |
| 16 | 5N | SR | Y | Y | BM | DS-25 |
| 17 | 4V | SR | Y | Y | BM | |
| 18 | 5P | SR | Y | Y | BM | |
| 19 | 5Q | SR | Y | Y | BM | DS-26 |
| 20 | 4W | SR | Y | Y | BM | |
| 21 | 4X | SR | Y | Y | BM | |
| 22 | 5R | SR | Y | Y | BM | |
| 23 | 5S | SR | Y | Y | BM | |
| 24 | 5T | SR | Y | Y | BM | |
| 25 | 7A | SR | Y | Y | BM | DS 27 |

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 26 | 6A | SR | Yes | Yes | BM | |
| 27 | 9F | SR | Y | Y | BM | |
| 28 | 7D | SR | Y | Y | BM | DS-29 |
| 29 | 7F | SR | Y | Y | BM | DS-28 |
| 30 | 3V | SR | Y | Y | BM | DS-22 |
| 31 | 3S | SR | Y | Y | BM | DS-20 |
| 32 | 5J | SR | Y | Y | BM | |
| 33 | 5I | SR | Y | Y | BM | |
| 34 | 5H | SR | Y | Y | BM | |
| 35 | 5G | SR | Y | Y | BM | |
| 36 | 5E | SR | Y | Y | BM | |
| 37 | 5D | SR | Y | Y | BM | |
| 38 | 5A | SR | Y | Y | BM | |
| 39 | 5B | SR | Y | Y | BM | DX-3 |
| 40 | 3X | SR | Y | Y | BM | |
| 41 | 15I | SR | Y | Y | BM | |
| 42 | 15J | SR | Y | Y | BM | |
| 43 | 15W | SR | Y | Y | BM | |
| 44 | 15V | SR | Y | Y | BM | |
| 45 | 15T | SR | Y | Y | BM | |
| 46 | 15S | SR | Y | Y | BM | |
| 47 | 12W | SR | Y | Y | BM | DS 59 |
| 48 | 16B | SR | Y | Y | BM | DX-8 |
| 49 | 14X | SR | Y | Y | BM | |
| 50 | 15R | SR | Y | Y | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/20/08

REVIEWED BY:

SHEET NUMBER: 3 OF 5

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 14W | SR | yes | yes | BM | |
| 2 | 12V | SR | Y | Y | BM | |
| 3 | 14V | SR | Y | Y | BM | |
| 4 | 14S | SR | Y | Y | BM | |
| 5 | 14T | SR | Y | Y | BM | |
| 6 | 14R | SR | Y | Y | BM | |
| 7 | 15F | SR | Y | Y | BM | |
| 8 | 15G | SR | Y | Y | BM | |
| 9 | 12G | SR | Y | Y | BM | DS-51 |
| 10 | 12E | SR | Y | Y | BM | |
| 11 | 9S | SR | Y | Y | BM | DS-47 |
| 12 | 11F | SR | Y | Y | BM | |
| 13 | 11D | SR | Y | Y | BM | |
| 14 | 9R | SR | Y | Y | BM | DS-46 |
| 15 | 9P | SR | Y | Y | BM | DS-45 |
| 16 | 11E | SR | Y | Y | BM | |
| 17 | 11C | SR | Y | Y | BM | |
| 18 | 11B | SR | Y | Y | BM | |
| 19 | 6P | SR | Y | Y | BM | |
| 20 | 9M | SR | Y | Y | BM | DS-43 |
| 21 | 6Q | SR | Y | Y | BM | |
| 22 | 6R | SR | Y | Y | BM | |
| 23 | 9J | SR | Y | Y | BM | DS-41 |
| 24 | 6S | SR | Y | Y | BM | |
| 25 | 15A | SR | Y | Y | BM | |

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 26 | 12O | SR | yes | yes | BM | |
| 27 | 12R | SR | Y | Y | BM | |
| 28 | 14A | SR | Y | Y | BM | |
| 29 | 14N | SR | Y | Y | BM | |
| 30 | 14Q | SR | Y | Y | BM | |
| 31 | 12X | SR | Y | Y | BM | DX-6 |
| 32 | 14P | SR | Y | Y | BM | |
| 33 | 12S | SR | Y | Y | BM | |
| 34 | 10V | SR | Y | Y | BM | |
| 35 | 14M | SR | Y | Y | BM | |
| 36 | 14K | SR | Y | Y | BM | |
| 37 | 14J | SR | Y | Y | BM | |
| 38 | 14I | SR | Y | Y | BM | |
| 39 | 14H | SR | Y | Y | BM | |
| 40 | 14G | SR | Y | Y | BM | |
| 41 | 13X | SR | Y | Y | BM | |
| 42 | 13W | SR | Y | Y | BM | |
| 43 | 12I | SR | Y | Y | BM | DS-53 |
| 44 | 14C | SR | Y | Y | BM | |
| 45 | 14B | SR | Y | Y | BM | |
| 46 | 12H | SR | Y | Y | BM | DS-52 |
| 47 | 14F | SR | Y | Y | BM | |
| 48 | 14E | SR | Y | Y | BM | |
| 49 | 14D | SR | Y | Y | BM | |
| 50 | 10T | SR | Y | Y | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/20/08

REVIEWED BY:

SHEET NUMBER: 4 of 5

| LINE NUMBER | DEFECT CODE | QC TECH INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 10S | SR | yes | yes | BM | |
| 2 | 13V | SR | Y | Y | BM | |
| 3 | 13T | SR | Y | Y | BM | |
| 4 | 13S | SR | Y | Y | BM | |
| 5 | 13R | SR | Y | Y | BM | |
| 6 | 13Q | SR | Y | Y | BM | |
| 7 | 13P | SR | Y | Y | BM | |
| 8 | 13N | SR | Y | Y | BM | |
| 9 | 13M | SR | Y | Y | BM | |
| 10 | 13K | SR | Y | Y | BM | |
| 11 | 13J | SR | Y | Y | BM | |
| 12 | 13I | SR | Y | Y | BM | |
| 13 | 13H | SR | Y | Y | BM | |
| 14 | 13G | SR | Y | Y | BM | |
| 15 | 13F | SR | Y | Y | BM | |
| 16 | 13E | SR | Y | Y | BM | |
| 17 | 13D | SR | Y | Y | BM | |
| 18 | 13C | SR | Y | Y | BM | |
| 19 | 13B | SR | Y | Y | BM | |
| 20 | 15D | SR | Y | Y | BM | |
| 21 | 12N | SR | Y | Y | BM | DS-54 |
| 22 | 12P | SR | Y | Y | BM | |
| 23 | 15B | SR | Y | Y | BM | DS 60 |
| 24 | 12K | SR | Y | Y | BM | |
| 25 | 10Q | SR | Y | Y | BM | |

| LINE NUMBER | DEFECT CODE | QC TECH INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 26 | 10R | SR | yes | yes | BM | |
| 27 | 12J | SR | Y | Y | BM | |
| 28 | 12D | SR | Y | Y | BM | |
| 29 | 12F | SR | Y | Y | BM | DS-50 |
| 30 | 15M | SR | Y | Y | BM | |
| 31 | 15K | SR | Y | Y | BM | |
| 32 | 15C | SR | Y | Y | BM | |
| 33 | 15N | SR | Y | Y | BM | |
| 34 | 12T | SR | Y | Y | BM | DS-57 |
| 35 | 15E | SR | Y | Y | BM | DS-61 |
| 36 | 15P | SR | Y | Y | BM | |
| 37 | 13A | SR | Y | Y | BM | |
| 38 | 10K | SR | Y | Y | BM | |
| 39 | 9T | SR | Y | Y | BM | DS-48 |
| 40 | 10M | SR | Y | Y | BM | |
| 41 | 10N | SR | Y | Y | BM | |
| 42 | 9I | SR | Y | Y | BM | DS-40 |
| 43 | 9G | SR | Y | Y | BM | DS-38 |
| 44 | 9X | SR | Y | Y | BM | |
| 45 | 11Q | SR | Y | Y | BM | |
| 46 | 11P | SR | Y | Y | BM | |
| 47 | 11N | SR | Y | Y | BM | |
| 48 | 11M | SR | Y | Y | BM | |
| 49 | 11K | SR | Y | Y | BM | |
| 50 | 11J | SR | Y | Y | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/20/08

REVIEWED BY: [illegible]

SHEET NUMBER: 5 OF 5

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 9W | SR | Yes | Y | BM | |
| 2 | 11I | SR | Y. | Y | BM | |
| 3 | 11H | SR | Y | Y | BM | |
| 4 | 11G | SR | Y | Y | BM | |
| 5 | 9N | SR | Y | Y | BM | DS-44 |
| 6 | 9K | SR | Y | Y | BM | DS-42 |
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| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/20/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | OBSERVED DEFECTS | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | NO | YES | | |
| 1 | P.110 | TIEIN | W005 | E005 | SR | yes | | ✓ | BM | Complete Between Patches |
| 2 | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/21/08

REVIEWED BY:

SHEET NUMBER: 1 of 2

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 6T | SR | Yes | Yes | BM | |
| 2 | 9H | SR | Y | Y | BM | DS-39 |
| 3 | 11A | SR | Y | Y | BM | |
| 4 | 6X | SR | Y | Y | BM | |
| 5 | 6V | SR | Y | Y | BM | |
| 6 | 6W | SR | Y | Y | BM | |
| 7 | 3J | SR | Y | Y | BM | DS-17 |
| 8 | 16C | SR | Y | Y | BM | |
| 9 | 2E | SR | Y | Y | BM | |
| 10 | 16D | SR | Y | Y | BM | |
| 11 | 16E | SR | Y | Y | BM | |
| 12 | 7P | SR | Y | Y | BM | DS-29 ? |
| 13 | 7C | SR | Y | Y | BM | |
| 14 | 5F | SR | Y | Y | BM | 5F |
| 15 | 3Q | SR | Y | Y | BM | |
| 16 | 3P | IS | Y | Y | BM | |
| 17 | 3N | IS | Y | Y | BM | |
| 18 | 3M | IS | Y | Y | BM | |
| 19 | 3I | IS | Y | Y | BM | |
| 20 | 3H | IS | Y | Y | BM | |
| 21 | 3G | IS | Y | Y | BM | 3G DS-16 |
| 22 | 3W | SR | Y | Y | BM | |
| 23 | 8V | SR | Y | Y | BM | DS-35 |
| 24 | 8T | SR | Y | Y | BM | DS-34 |
| 25 | 8X | SR | Y | Y | BM | |
| 26 | 8S | SR | Yes | Yes | BM | DS-33 |
| 27 | 9A | SR | Y | Y | BM | |
| 28 | 8W | SR | Y | Y | BM | DS-36 |
| 29 | 9B | SR | Y | Y | BM | |
| 30 | 9C | SR | Y | Y | BM | |
| 31 | 11X | SR | Y | Y | BM | |
| 32 | 11W | SR | Y | Y | BM | |
| 33 | 11V | SR | Y | Y | BM | |
| 34 | 11T | SR | Y | Y | BM | |
| 35 | 11S | SR | Y | Y | BM | |
| 36 | 11R | SR | Y | Y | BM | |
| 37 | 12C | SR | Y | Y | BM | |
| 38 | 12B | SR | Y | Y | BM | |
| 39 | 10A | SR | Y | Y | BM | |
| 40 | 10B | SR | Y | Y | BM | |
| 41 | 10C | SR | Y | Y | BM | |
| 42 | 10D | SR | Y | Y | BM | |
| 43 | 10E | SR | Y | Y | BM | |
| 44 | 10F | SR | Y | Y | BM | |
| 45 | 10G | SR | Y | Y | BM | |
| 46 | 10H | SR | Y | Y | BM | |
| 47 | 10I | SR | Y | Y | BM | |
| 48 | 10J | SR | Y | Y | BM | |
| 49 | 15H | SR | Y | Y | BM | |
| 50 | 15X | SR | Y | Y | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/21/08

REVIEWED BY:

SHEET NUMBER: 2 of 2

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 15Q | SR | yes | yes | BM | |
| 2 | 11A | SR | yes | yes | BM | |
| 3 | 10P | SR | y | y | BM | |
| 4 | 9V | SR | y | y | BM | DS49 / 16A |
| 5 | 9H | SR | y | y | BM | DS-39 |
| 6 | 9D | SR | y | y | BM | DS-37 |
| 7 | 9E | SR | y | y | BM | + |
| 8 | 16F | SR | y | y | BM | DX-9 |
| 9 | 16A | SR | y | y | BM | DS49 |
| 10 | 16G | SR | y | y | BM | |
| 11 | 16H | SR | y | y | BM | |
| 12 | 12A | SR | y | y | BM | |
| 13 | | | | | | |
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| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/21/08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH INITIALS | OBSERVED DEFECTS | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | NO | YES | | |
| 1 | P-50 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between patches |
| 2 | P-46 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 3 | P-45 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 4 | P-100 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 5 | P-102 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 6 | P-49 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between patches |
| 7 | P-33 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 8 | P-35 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 9 | P-37 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 10 | P-39 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 11 | P-41 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 12 | P-43 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 13 | P-97 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 14 | P-96 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 15 | P-93 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 16 | P-92 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | good Between Patches |
| 17 | P-88 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 18 | P-87 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 19 | P-85 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 20 | P-82 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 21 | P-81 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 22 | P-78 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 23 | P-77 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 24 | P-108 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |
| 25 | P-105 | TIE IN | Weos | Eeos | SR | N | | ✓ | BM | |

ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE SEAM VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6/21/08

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 2

| LINE NUMBER | SEAM NUMBER | | SEAM SECTION | | QC TECH. INITIALS | OBSERVED DEFECTS | SEAM COMPLETED | | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FIRST PANEL | SECOND PANEL | START POINT | FINISH POINT | | | NO | YES | | |
| 1 | P-104 | TIE In | West | East | SR | N | | ✓ | BM | |
| 2 | | | | | | | | | | |
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ATLANTIC COAST CONSULTING, INC

# GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: A011.102

PROJECT TITLE: CMS Landfill V Cell 2G

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 6-24-08

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 1

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 1 | 16 I | JM | N | Y | BM | |
| 2 | 16 J | " | N | Y | RTH | |
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| 25 | | | | | | |

| LINE NUMBER | DEFECT CODE | QC TECH. INITIALS | OBSERVED DEFECTS | REPAIR COMPLETED YES OR NO | CQA MONITOR INITIALS | REMARKS |
|---|---|---|---|---|---|---|
| 26 | | | | | | |
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ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

# APPENDIX N

## Destructive Seam Strength Testing

# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-21-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DX-1** | | | | | | | |
| **Weld:** | **Single Extrusion** | | | | | | | |
| | | | | | | | Peel A | |
| Peel Strength (ppi) | | 116 | 122 | 121 | 123 | 122 | 121 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 160 | 155 | 154 | 156 | 158 | 157 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-1** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 104 | 136 | 137 | 136 | 131 | 129 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 114 | 114 | 131 | 117 | 112 | 118 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 165 | 163 | 161 | 163 | 163 | 163 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-21-08**

| | PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-2** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 152 | 152 | 153 | 148 | 145 | Peel A 150 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 139 | 151 | 159 | 140 | 146 | Peel B 147 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 173 | 170 | 173 | 173 | 170 | Shear 172 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-3** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 110 | 107 | 103 | 133 | 106 | Peel A 112 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 109 | 110 | 119 | 110 | 125 | Peel B 115 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 159 | 160 | 158 | 160 | 156 | Shear 159 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-21-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-4** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | | | | | | | Peel A | |
| Peel Strength (ppi) | | 131 | 127 | 127 | 115 | 122 | 124 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| 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 | 112 | 100 | 104 | 101 | 104 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 158 | 159 | 157 | 159 | 157 | 158 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-5** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | | | | | | | Peel A | |
| Peel Strength (ppi) | | 117 | 113 | 116 | 111 | 116 | 115 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| 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) | | 107 | 104 | 107 | 106 | 103 | 105 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 161 | 159 | 159 | 156 | 152 | 157 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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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**TRI / Environmental, Inc.**
*A Texas Research International Company*

# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-21-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-6** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 126 | 119 | 123 | 124 | 122 | 123 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 103 | 110 | 102 | 110 | 107 | 106 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 156 | 156 | 156 | 158 | 154 | 156 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-7** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 108 | 116 | 107 | 113 | 104 | 110 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 104 | 100 | 118 | 95 | 95 | 102 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 163 | 162 | 160 | 162 | 159 | 161 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-24-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DX-2** | | | | | | | |
| **Weld:** | **Single Extrusion** | | | | | | | |
| | | | | | | | Peel A | |
| Peel Strength (ppi) | | 125 | 111 | 117 | 107 | 120 | 116 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 154 | 155 | 155 | 157 | 155 | 155 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-8** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 119 | 134 | 112 | 133 | 106 | 121 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 109 | 109 | 107 | 109 | 105 | 108 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 169 | 167 | 166 | 168 | 166 | 167 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-24-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-9** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 104 | 109 | 108 | 110 | 108 | Peel A 108 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 122 | 108 | 127 | 111 | 110 | Peel B 116 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 166 | 166 | 166 | 165 | 166 | Shear 166 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-10** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 133 | 142 | 99 | 124 | 138 | Peel A 127 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 117 | 127 | 122 | 123 | 124 | Peel B 123 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 166 | 164 | 162 | 164 | 163 | Shear 164 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-24-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-11** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 112 | 108 | 112 | 109 | 109 | 110 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 112 | 115 | 111 | 111 | 110 | 112 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 170 | 168 | 169 | 169 | 167 | 169 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-12** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 138 | 143 | 128 | 148 | 128 | 137 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 113 | 106 | 113 | 111 | 114 | 111 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 170 | 168 | 170 | 169 | 167 | 169 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-24-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-13** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 115 | 107 | 114 | 116 | 118 | Peel A 114 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 127 | 127 | 116 | 128 | 131 | Peel B 126 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 169 | 168 | 165 | 169 | 164 | Shear 167 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-14** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 94 | 115 | 101 | 103 | 99 | Peel A 102 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 114 | 109 | 115 | 123 | 110 | Peel B 114 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 165 | 162 | 165 | 165 | 163 | Shear 164 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-24-02**

| | PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| | **Sample ID:** DS-15 | | | | | | | |
| | **Weld:** Heat Fusion | | | | | | | |
| Side A | Peel Strength (ppi) | 167 | 143 | 166 | 154 | 163 | Peel A 159 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 152 | 139 | 142 | 162 | 143 | Peel B 148 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 174 | 172 | 175 | 174 | 172 | Shear 173 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-26-03**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|
| **Sample ID:** DX-3 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel A | |
| Peel Strength (ppi) | 155 | 146 | 154 | 149 | 152 | 151 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 157 | 154 | 152 | 160 | 154 | 155 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** DX-4 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 124 | 128 | 129 | 113 | 108 | 120 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 168 | 164 | 162 | 167 | 161 | 164 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-26-03**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-16** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 94 | 101 | 97 | 98 | 91 | 96 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 103 | 107 | 102 | 109 | 124 | 109 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 158 | 161 | 160 | 161 | 160 | 160 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-17** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 129 | 120 | 122 | 127 | 122 | 124 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 118 | 120 | 117 | 136 | 130 | 124 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 156 | 159 | 157 | 158 | 157 | 157 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-26-03**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-18** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 118 | 129 | 127 | 113 | 126 | Peel A 123 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 109 | 108 | 109 | 112 | 110 | Peel B 110 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 159 | 160 | 163 | 161 | 161 | Shear 161 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-19** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 115 | 108 | 108 | 108 | 109 | Peel A 110 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 103 | 107 | 101 | 101 | 99 | Peel B 102 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 165 | 164 | 165 | 164 | 163 | Shear 164 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-26-03**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-20** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 118 | 115 | 113 | 117 | 119 | 116 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 115 | 118 | 119 | 120 | 118 | 118 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 146 | 157 | 158 | 163 | 148 | 154 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-21** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 116 | 124 | 116 | 120 | 120 | 119 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 111 | 106 | 117 | 133 | 111 | 116 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 158 | 159 | 158 | 160 | 157 | 158 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-26-03**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-22** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 114 | 119 | 125 | 122 | 114 | 119 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 97 | 107 | 108 | 101 | 103 | 103 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 159 | 156 | 160 | 157 | 153 | 157 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-23** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 116 | 115 | 121 | 116 | 116 | 117 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 110 | 117 | 105 | 121 | 114 | 113 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 157 | 159 | 157 | 157 | 155 | 157 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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**TRI / Environmental, Inc.**
*A Texas Research International Company*

# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-28-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-24** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 104 | 113 | 115 | 105 | 111 | Peel A 110 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 111 | 124 | 118 | 119 | 107 | Peel B 116 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 158 | 160 | 158 | 159 | 158 | Shear 159 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-25** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 111 | 142 | 116 | 145 | 113 | Peel A 125 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 121 | 118 | 122 | 122 | 132 | Peel B 123 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 156 | 158 | 154 | 155 | 155 | Shear 156 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-28-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-26** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 121 | 110 | 118 | 118 | 122 | Peel A 118 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 131 | 125 | 126 | 124 | 124 | Peel B 126 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 151 | 153 | 156 | 155 | 156 | Shear 154 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-27** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 129 | 140 | 128 | 119 | 125 | Peel A 128 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 109 | 108 | 105 | 106 | 109 | Peel B 107 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 155 | 157 | 155 | 156 | 155 | Shear 156 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-28-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-28** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 125 | 130 | 127 | 131 | 126 | Peel A 128 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 108 | 105 | 106 | 106 | 110 | Peel B 107 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 157 | 158 | 160 | 160 | 159 | Shear 159 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-29** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 102 | 105 | 99 | 102 | 104 | Peel A 102 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 103 | 100 | 99 | 101 | 98 | Peel B 100 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 150 | 153 | 153 | 154 | 154 | Shear 153 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-28-02**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-30** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 117 | 142 | 110 | 138 | 141 | 130 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 107 | 119 | 109 | 114 | 109 | 112 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 151 | 157 | 155 | 156 | 157 | 155 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-31** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 143 | 114 | 113 | 137 | 112 | 124 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 117 | 102 | 121 | 126 | 127 | 119 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 156 | 160 | 158 | 157 | 157 | 158 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-28-02**

| | PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| | **Sample ID:** DS-32 | | | | | | | |
| | **Weld:** Heat Fusion | | | | | | | |
| Side A | Peel Strength (ppi) | 95 | 101 | 108 | 105 | 98 | Peel A 101 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 100 | 107 | 108 | 101 | 98 | Peel B 103 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 164 | 163 | 164 | 165 | 165 | Shear 164 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-29-06**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DX-5** | | | | | | | |
| **Weld:** | **Single Extrusion** | | | | | | | |
| | | | | | | | Peel | |
| Peel Strength (ppi) | | 95 | 90 | 80 | 112 | 113 | 98 | 82 min |
| Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 160 | 155 | 155 | 161 | 153 | 157 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-33** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 157 | 167 | 166 | 167 | 166 | 165 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 168 | 162 | 174 | 168 | 174 | 169 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 173 | 168 | 170 | 172 | 169 | 170 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

Failed
See Retests DX-5A3 & DX-5B

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-29-06**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-34** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 107 | 108 | 108 | 107 | 110 | 108 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 100 | 106 | 104 | 106 | 104 | 104 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 168 | 166 | 166 | 166 | 166 | 166 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-35** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A | Peel Strength (ppi) | 98 | 103 | 102 | 102 | 107 | 102 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B | Peel Strength (ppi) | 118 | 107 | 105 | 103 | 129 | 112 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| | Shear Strength (ppi) | 161 | 161 | 159 | 159 | 161 | 160 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-29-06**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-36** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 147 | 126 | 129 | 143 | 133 | 136 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 112 | 112 | 106 | 114 | 112 | 111 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 165 | 159 | 164 | 162 | 164 | 163 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-37** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 120 | 121 | 124 | 122 | 124 | 122 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 120 | 126 | 116 | 114 | 115 | 118 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 158 | 154 | 155 | 157 | 157 | 156 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|
| **Sample ID:** DX-5A1 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 88 | 93 | 84 | 92 | 80 | 87 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 148 | 149 | 147 | 149 | 149 | 148 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** DX-5B1 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 124 | 118 | 112 | 93 | 138 | 117 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 165 | 164 | 165 | 161 | 163 | 164 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Failed
See DX-5A3

Pass

Retest DX-5 in the Backward Direction

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-38** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 105 | 113 | 106 | 105 | 105 | Peel A 107 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 125 | 105 | 127 | 117 | 117 | Peel B 118 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 159 | 162 | 162 | 161 | 164 | Shear 162 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-39** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 107 | 135 | 108 | 132 | 105 | Peel A 117 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 106 | 114 | 109 | 116 | 122 | Peel B 113 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 166 | 167 | 166 | 167 | 166 | Shear 166 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-40** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 104 | 119 | 101 | 122 | 128 | Peel A 115 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 138 | 129 | 131 | 139 | 117 | Peel B 131 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 167 | 168 | 166 | 170 | 166 | Shear 167 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-41** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 132 | 105 | 122 | 118 | 116 | Peel A 119 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 109 | 110 | 112 | 108 | 104 | Peel B 109 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 168 | 169 | 169 | 170 | 169 | Shear 169 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-42** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 114 | 112 | 110 | 117 | 124 | Peel A 115 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 114 | 112 | 105 | 109 | 101 | Peel B 108 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 166 | 164 | 164 | 163 | 163 | Shear 164 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-43** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 127 | 123 | 126 | 134 | 135 | Peel A 129 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 114 | 110 | 111 | 110 | 111 | Peel B 111 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 171 | 173 | 172 | 172 | 168 | Shear 171 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-44** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 129 | 126 | 104 | 104 | 109 | Peel A 114 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 100 | 98 | 112 | 101 | 98 | Peel B 102 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 163 | 162 | 166 | 165 | 166 | Shear 164 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-45** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 132 | 137 | 124 | 143 | 128 | Peel A 133 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 118 | 116 | 117 | 118 | 123 | Peel B 118 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 160 | 161 | 160 | 161 | 161 | Shear 161 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-46** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 124 | 129 | 126 | 136 | 127 | 128 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 132 | 118 | 130 | 120 | 122 | 124 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 166 | 167 | 166 | 169 | 164 | 166 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-47** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 152 | 151 | 150 | 154 | 149 | 151 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | Pass |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 152 | 151 | 159 | 159 | 153 | 155 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 177 | 174 | 176 | 175 | 173 | 175 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-35-10**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-48** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 133 | 122 | 120 | 131 | 121 | Peel A 125 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 117 | 119 | 118 | 121 | 118 | Peel B 119 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 160 | 159 | 160 | 158 | 160 | Shear 159 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-49** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 128 | 115 | 119 | 116 | 120 | Peel A 120 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 111 | 109 | 119 | 108 | 114 | Peel B 112 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 161 | 161 | 160 | 161 | 159 | Shear 160 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-50** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 116 | 116 | 111 | 117 | 114 | 115 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 119 | 127 | 109 | 121 | 124 | 120 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 167 | 169 | 167 | 170 | 168 | 168 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-51** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 109 | 138 | 132 | 141 | 113 | 127 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 134 | 122 | 121 | 127 | 116 | 124 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 163 | 163 | 162 | 164 | 162 | 163 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-35-10**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-52** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 100 | 107 | 105 | 94 | 110 | 103 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 104 | 122 | 101 | 106 | 118 | 110 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 160 | 156 | 156 | 157 | 157 | 157 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-53** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 125 | 129 | 122 | 122 | 121 | 124 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 102 | 111 | 108 | 116 | 103 | 108 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 155 | 155 | 155 | 155 | 153 | 155 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-33-08**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-54** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 133 | 124 | 142 | 139 | 134 | Peel A 134 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 146 | 131 | 145 | 130 | 128 | Peel B 136 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 150 | 150 | 147 | 148 | 147 | Shear 148 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-55** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 107 | 97 | 104 | 104 | 129 | Peel A 108 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 107 | 112 | 106 | 103 | 105 | Peel B 107 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 162 | 163 | 159 | 163 | 158 | Shear 161 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-35-10**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-56** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 105 | 103 | 112 | 108 | 112 | 108 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 113 | 113 | 112 | 111 | 106 | 111 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 153 | 152 | 154 | 153 | 153 | 153 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-57** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| | | | | | | | Peel A | |
| Side A: Peel Strength (ppi) | | 139 | 126 | 103 | 147 | 131 | 129 | 82 min |
| Side A: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side A: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | Pass |
| Side A: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Peel B | |
| Side B: Peel Strength (ppi) | | 110 | 122 | 134 | 128 | 141 | 127 | 82 min |
| Side B: Peel Incursion (%) | | <10 | <10 | <10 | <10 | <10 | | |
| Side B: Peel Locus of Failure Code | | SE | SE | SE | SE | SE | | |
| Side B: Peel NSF Failure Code | | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | | Shear | |
| Shear Strength (ppi) | | 162 | 161 | 163 | 162 | 165 | 163 | 126 min |
| Shear Elongation @ Break (%) | | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-35-10**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-58** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 122 | 128 | 126 | 137 | 134 | Peel A 129 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 119 | 115 | 115 | 118 | 122 | Peel B 118 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 162 | 164 | 163 | 164 | 164 | Shear 163 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-59** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 143 | 110 | 107 | 122 | 130 | Peel A 122 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| Side B | Peel Strength (ppi) | 110 | 121 | 119 | 118 | 124 | Peel B 118 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 169 | 167 | 167 | 168 | 166 | Shear 167 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

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## DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-35-10**

| PARAMETER | | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|---|
| **Sample ID:** | **DS-60** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 113 | 122 | 130 | 112 | 135 | Peel A 122 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 107 | 107 | 106 | 111 | 103 | Peel B 107 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 146 | 144 | 144 | 147 | 141 | Shear 144 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** | **DS-61** | | | | | | | |
| **Weld:** | **Heat Fusion** | | | | | | | |
| Side A | Peel Strength (ppi) | 119 | 121 | 124 | 123 | 124 | Peel A 122 | 82 min |
| Side A | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side A | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side A | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | Pass |
| Side B | Peel Strength (ppi) | 116 | 109 | 93 | 100 | 96 | Peel B 103 | 82 min |
| Side B | Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Side B | Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Side B | Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | Shear Strength (ppi) | 149 | 148 | 147 | 146 | 145 | Shear 147 | 126 min |
| | Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-35-10**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|
| **Sample ID:** DX-6 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 113 | 117 | 119 | 126 | 144 | 124 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 149 | 146 | 146 | 149 | 145 | 147 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** DX-7 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 132 | 114 | 129 | 113 | 130 | 124 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 155 | 153 | 151 | 152 | 152 | 153 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** DX-8 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 134 | 122 | 121 | 135 | 133 | 129 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 174 | 173 | 170 | 173 | 167 | 171 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass

Pass

Pass

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-36-08**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|
| **Sample ID:** DX-5A2 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 124 | 115 | 111 | 79 | 123 | 110 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Failed |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | See DX-5A3 |
| Shear Strength (ppi) | 160 | 158 | 157 | 154 | 152 | 156 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** DX-9 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 120 | 92 | 105 | 108 | 95 | 104 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 150 | 147 | 149 | 150 | 148 | 149 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |
| **Sample ID:** DX-10 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 145 | 157 | 142 | 160 | 137 | 148 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | Pass |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 168 | 168 | 169 | 168 | 163 | 167 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

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# DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

**TRI Client: Atlantic Coast Consulting, Inc. (ACC)**
**Project: Charlotte Motor Speedway Landfill- Cell 2G**

**Material: 60 mil HDPE**
**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)**
**TRI Log #: E2312-41-10**

| PARAMETER | TEST REPLICATE NUMBER 1 | 2 | 3 | 4 | 5 | MEAN | PROJ. SPEC. |
|---|---|---|---|---|---|---|---|
| **Sample ID:** DX-5A3 | | | | | | | |
| **Weld:** Single Extrusion | | | | | | | |
| | | | | | | Peel | |
| Peel Strength (ppi) | 123 | 125 | 120 | 126 | 118 | 122 | 82 min |
| Peel Incursion (%) | <10 | <10 | <10 | <10 | <10 | | |
| Peel Locus of Failure Code | SE | SE | SE | SE | SE | | |
| Peel NSF Failure Code | FTB | FTB | FTB | FTB | FTB | | |
| | | | | | | Shear | |
| Shear Strength (ppi) | 163 | 160 | 159 | 165 | 155 | 160 | 126 min |
| Shear Elongation @ Break (%) | >50 | >50 | >50 | >50 | >50 | | |

Pass
Retest DX-
In the Ab
Direct

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# APPENDIX O

## Protective Cover Laboratory Test Results

**TIMELY ENGINEERING SOIL TESTS, LLC**

1874 Forge Street Tucker, GA 30084
Phone: 770-938-8233 Fax: 770-923-8973
Cell: 678-612-6534
Web: www.test-llc.com

# Summary of Soil Testing (PC-Samples)

**Project Number:** 801

**Project Name:** CMS Landfill

| T.E.S.T. Sample Number | Client Sample Number | USCS | Moisture Content (%) | Grain Size Distribution | | | Atterberg Limits | | | Proctor | | Hydraulic Conductivity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | %Finer 6" Sieve | % Finer #4 Sieve | % Finer 0.005mm | L.L. % | P.L. % | P.I. % | Opt. M.C. % | Max.Dry. Density pcf | Initial M.C. % | Init.Dry Density pcf | Hydraulic Conduct. cm/sec |
| 5232 | PC-1 | - | - | 100.0 | 98.5 | - | - | - | - | - | - | - | - | - |
| 5233 | PC-2 | - | - | 100.0 | 99.2 | - | - | - | - | - | - | - | - | - |
| 5234 | PC-3 | - | - | 100.0 | 99.7 | - | - | - | - | - | - | - | - | - |
| 5235 | PC-4 | - | - | 100.0 | 97.9 | - | - | - | - | - | - | - | - | - |
| 5236 | PC-5 | - | - | 100.0 | 97.8 | - | - | - | - | - | - | - | - | - |
| 5237 | PC-6 | - | - | 100.0 | 98.6 | - | - | - | - | - | - | - | - | - |

| | | | |
|---|---|---|---|
| TIMELY ENGINEERING SOIL TESTS, LLC | 1874 Forge Street Tucker, GA 30084<br>Phone: 770-938-8233<br>Fax: 770-923-8973<br>Web: www.test-llc.com | Tested By | RI |
| | | Date | 06/12/08 |
| | | Checked By | |

**ASTM C 136/D 6913 (D 422 old version)**

**Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)**

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bag |
| Sample ID | 5232/PC-1 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

AS-RECEIVED MOISTURE CONTENT

| | |
|---|---|
| Mass of Wet Sample & Tare, g | 576.7 |
| Mass of Dry Sample & Tare, g | 538.0 |
| Mass of Tare, g | 100.5 |
| Moisture Content, % | 8.8 |

**REMARKS**

| | |
|---|---|
| **REQUESTED SIEVE SIZE** | #4 |

100% of total material passed 6" sieve

**SIEVE ANALYSIS**

| | |
|---|---|
| Mass of wet sample used for sieve analysis & tare, g | 4026.7 |
| Mass of tare, g | 0.0 |
| Mass of dry sample used for sieve analysis, g | 3699.5 |

| | |
|---|---|
| Mass of Tare, g | 0.0 |
| Mass of sample retained on requested sieve and tare, g | 54.1 |
| Percent of sample retained on requested sieve | 1 |
| **Percent of material finer than requested sieve, %** | 98.5 |

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

| | |
|---|---|
| Requested sieve ID # | 31 |
| Balance ID # | 1/6/7/79 |
| Oven ID # | 12/13/14 |

TIMELY
ENGINEERING
SOIL
TESTS, LLC

1874 Forge Street Tucker, GA 30084
Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

| | |
|---|---|
| Tested By | RI |
| Date | 06/12/08 |
| Checked By | |

**ASTM C 136/D 6913 (D 422 old version)**

**Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)**

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bag |
| Sample ID | 5233/PC-2 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

AS-RECEIVED MOISTURE CONTENT

| | |
|---|---|
| Mass of Wet Sample & Tare, g | 546.7 |
| Mass of Dry Sample & Tare, g | 503.0 |
| Mass of Tare, g | 90.8 |
| Moisture Content, % | 10.6 |

**REMARKS**

**REQUESTED SIEVE SIZE** #4

100% of total material passed 6" sieve

**SIEVE ANALYSIS**

| | |
|---|---|
| Mass of wet sample used for sieve analysis & tare, g | 4129.4 |
| Mass of tare, g | 0.0 |
| Mass of dry sample used for sieve analysis, g | 3733.6 |

| | |
|---|---|
| Mass of Tare, g | 0.0 |
| Mass of sample retained on requested sieve and tare, g | 31.7 |
| Percent of sample retained on requested sieve | 1 |

**Percent of material finer than requested sieve, %** 99.2

DESCRIPTION NA

USCS (ASTM D2487; D2488) NA

AASHTO (M 145) NA

| | |
|---|---|
| Requested sieve ID # | 31 |
| Balance ID # | 1/6/7/79 |
| Oven ID # | 12/13/14 |

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1874 Forge Street Tucker, GA 30084
Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

| | |
|---|---|
| Tested By | RI |
| Date | 06/12/08 |
| Checked By | |

**ASTM C 136/D 6913 (D 422 old version)**

**Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)**

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bag |
| Sample ID | 5234/PC-3 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

AS-RECEIVED MOISTURE CONTENT

| | |
|---|---|
| Mass of Wet Sample & Tare, g | 504.5 |
| Mass of Dry Sample & Tare, g | 465.0 |
| Mass of Tare, g | 89.3 |
| Moisture Content, % | 10.5 |

**REMARKS**

**REQUESTED SIEVE SIZE** #4

100% of total material passed 6" sieve

**SIEVE ANALYSIS**

| | |
|---|---|
| Mass of wet sample used for sieve analysis & tare, g | 3568.0 |
| Mass of tare, g | 0.0 |
| Mass of dry sample used for sieve analysis, g | 3228.6 |

| | |
|---|---|
| Mass of Tare, g | 0.0 |
| Mass of sample retained on requested sieve and tare, g | 8.2 |
| Percent of sample retained on requested sieve | 0 |

**Percent of material finer than requested sieve, %** 99.7

DESCRIPTION NA

USCS (ASTM D2487; D2488) NA

AASHTO (M 145) NA

| | |
|---|---|
| Requested sieve ID # | 31 |
| Balance ID # | 1/6/7/79 |
| Oven ID # | 12/13/14 |

| | | | |
|---|---|---|---|
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| | | Date | 06/12/08 |
| | | Checked By | |

**ASTM C 136/D 6913 (D 422 old version)**

**Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)**

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bag |
| Sample ID | 5235/PC-4 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

AS-RECEIVED MOISTURE CONTENT

| | |
|---|---|
| Mass of Wet Sample & Tare, g | 564.9 |
| Mass of Dry Sample & Tare, g | 522.6 |
| Mass of Tare, g | 94.3 |
| Moisture Content, % | 9.9 |

**REMARKS**

**REQUESTED SIEVE SIZE** #4

100% of total material passed 6" sieve

**SIEVE ANALYSIS**

| | |
|---|---|
| Mass of wet sample used for sieve analysis & tare, g | 3922.5 |
| Mass of tare, g | 0.0 |
| Mass of dry sample used for sieve analysis, g | 3569.9 |

| | |
|---|---|
| Mass of Tare, g | 0.0 |
| Mass of sample retained on requested sieve and tare, g | 75.6 |
| Percent of sample retained on requested sieve | 2 |
| **Percent of material finer than requested sieve, %** | 97.9 |

DESCRIPTION NA

USCS (ASTM D2487; D2488) NA

AASHTO (M 145) NA

| | |
|---|---|
| Requested sieve ID # | 31 |
| Balance ID # | 1/6/7/79 |
| Oven ID # | 12/13/14 |

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| | |
|---|---|
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| Checked By | |

**ASTM C 136/D 6913 (D 422 old version)**

**Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)**

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bag |
| Sample ID | 5236/PC-5 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

AS-RECEIVED MOISTURE CONTENT

| | |
|---|---|
| Mass of Wet Sample & Tare, g | 533.8 |
| Mass of Dry Sample & Tare, g | 490.2 |
| Mass of Tare, g | 87.7 |
| Moisture Content, % | 10.8 |

**REMARKS**

**REQUESTED SIEVE SIZE** #4

100% of total material passed 6" sieve

**SIEVE ANALYSIS**

| | |
|---|---|
| Mass of wet sample used for sieve analysis & tare, g | 3705.6 |
| Mass of tare, g | 0.0 |
| Mass of dry sample used for sieve analysis, g | 3343.4 |

| | |
|---|---|
| Mass of Tare, g | 0.0 |
| Mass of sample retained on requested sieve and tare, g | 75.0 |
| Percent of sample retained on requested sieve | 2 |
| **Percent of material finer than requested sieve, %** | 97.8 |

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

| | |
|---|---|
| Requested sieve ID # | 31 |
| Balance ID # | 1/6/7/79 |
| Oven ID # | 12/13/14 |

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| | |
|---|---|
| Tested By | RI |
| Date | 06/12/08 |
| Checked By | |

**ASTM C 136/D 6913 (D 422 old version)**

**Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)**

| | | | |
|---|---|---|---|
| Client Pr. # | - | Lab. PR. # | 801-04 |
| Pr. Name | CMS L.F. | S. Type | Bag |
| Sample ID | 5237/PC-6 | Depth/Elev. | - |
| Location | Protective Cover | Add. Info | - |

AS-RECEIVED MOISTURE CONTENT

| | |
|---|---|
| Mass of Wet Sample & Tare, g | 639.3 |
| Mass of Dry Sample & Tare, g | 597.5 |
| Mass of Tare, g | 108.3 |
| Moisture Content, % | 8.5 |

**REMARKS**

**REQUESTED SIEVE SIZE** #4

100% of total material passed 6" sieve

**SIEVE ANALYSIS**

| | |
|---|---|
| Mass of wet sample used for sieve analysis & tare, g | 3729.2 |
| Mass of tare, g | 0.0 |
| Mass of dry sample used for sieve analysis, g | 3435.6 |

| | |
|---|---|
| Mass of Tare, g | 0.0 |
| Mass of sample retained on requested sieve and tare, g | 46.4 |
| Percent of sample retained on requested sieve | 1 |
| **Percent of material finer than requested sieve, %** | 98.6 |

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

| | |
|---|---|
| Requested sieve ID # | 31 |
| Balance ID # | 1/6/7/79 |
| Oven ID # | 12/13/14 |