Final Certification Report

Construction Quality Assurance Services

Cell 2I Construction
Charlotte Motor Speedway Landfill V
Cabarrus County, North Carolina

Volume I

Prepared For:

BFI Waste Systems of North America, Inc.
Charlotte Motor Speedway Landfill V
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Concord, North Carolina 28027

Prepared by:

ACC of NORTH CAROLINA, PLLC

February 2011

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SECTION 1

Introduction

SECTION 1
Introduction

1.1 Project Description

BFI Waste Systems of North America, Inc., a wholly owned subsidiary or Republic Services, Inc., currently owns and operates the Charlotte Motor Speedway Landfill V located in Cabaurrus County, North Carolina. This report documents construction quality assurance (CQA) monitoring and testing services performed during the construction of Cell 2I of landfill Phase 3. Cell 2I is a solid waste disposal cell encompassing approximately 16.3 acres of composite lined area.

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

- A prepared subgrade;
- A 2-foot thick compacted soil liner with a maximum permeability of $1x10^{-7}$ cm/sec;
- A 60-mil thick textured High Density Polyethylene (HDPE) geomembrane;
- A double sided heat bonded with 8 ounce per square yard geotextile on both sides geocomposite; and
- A 2-foot thick protective cover layer with a minimum permeability of $1x10^{-4}$ cm/sec and associated leachate collection and removal system.

1.2 Scope of Services

ACC of North Carolina, LLC (ACC) was retained by BFI Waste Systems of North America, Inc., a wholly owned subsidiary or Republic Services, Inc., to provide Construction Quality Assurance (CQA) monitoring and testing services during construction of the prepared subgrade, structural fill, low permeability compacted soil liner, 60-mil geomembrane, protective cover layer and associated leachate collection and removal system.

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

- Drawing Numbers 1 to 15 inclusive, entitled "Construction Drawings – Cell 2I Construction - Charlotte Motor Speedway Landfill V," prepared by SCS Engineers, PC and dated July 2010 (referenced to in this report as the Construction Drawings).

- "Construction Documents and Technical Specifications for the Charlotte Motor Speedway (CMS) Landfill Cell 2I Construction" prepared by SCS Engineers, PC and dated July 9, 2010 (referenced to in this report as the Technical Specifications).

- "CQA Plan – Construction Quality Assurance Plan - Charlotte Motor Speedway Landfill V – Phase 3 Permit to Construct" prepared by Hodges, Harbin, Newberry & Tribble, Inc. and dated May 2009 (referenced to in this report as the CQA Plan).

In addition to the above, a modification to the construction documents protective cover minimum permeability requirements was utilized. This modification was approved by the NCDENR Solid Waste Section and was included as part of the landfill's Permit to Construct. A copy of this modification is included in Appendix A.

For the purposes of clarity, the above documents and modification 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 Cell 2I. 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 Cell 2I was 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 2I construction. The resident manager was assisted by a geosynthetics monitor during the installation of the geomembrane liner materials.

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 2I construction at the Charlotte Motor Speedway Landfill V consisted of:

- BFI Waste Systems of North America, Inc., a wholly owned subsidiary or Republic Services, Inc. (Owner), as owner and operator of the Charlotte Motor Speedway Landfill V facility;
- SCS Engineers, PC (SCS), as the design engineer during construction of Cell 2I;
- ACC of North Carolina, LLC (ACC), as the CQA Consultant during construction of Cell 2I;
- 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; and
- Lawrence Associates, PA (LA), as the Registered Professional Land Surveyor (North Carolina).

2.2 Prepared Subgrade and Structural Fill Construction

Construction of the prepared subgrade and structural fill components for Cell 2I started on September 20, 2010, and were completed on November 16, 2010. EGI hauled approximately 190,000 cubic yards of structural fill materials obtained from an approved borrow source for construction of Cell 2I. The soil was placed, where required, in accordance with the Project Specifications.

The ACC Resident Manager was on-site during placement of structural fill materials. Elevations of the completed prepared subgrade and structural fill construction were obtained and reviewed by LA's Registered Professional Land Surveyor to verify grades for compliance with the

construction drawings. A copy of the record drawing showing the completion of the structural fill material, titled " Topographic Survey of the Verified Subgrade " was provided to ACC by LA and is presented as Figure 1.

2.3 Compacted Soil Liner Construction

Construction of compacted soil liner material started on November 17, 2010, and was completed on November 29, 2010. Approximately 54,000 cubic yards of compacted soil liner material was placed on the floor and side slopes of Cell 2I. EGI carried out routine maintenance of the compacted soil liner material until it was covered by the geosynthetic materials.

A record drawing showing the final grade elevations of the compacted soil liner, entitled "Topographic Survey of the Verified Clay" was provided to ACC by LA and is presented as Figure 2.

2.4 Geosynthetics Installation

ESI began the geomembrane liner installation for Cell 2I on December 6, 2010, and completed the installation on December 20, 2010. The geomembrane liner consists of approximately 710,000 square feet of material covering all of Cell 2I. 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 3.

2.5 Leachate Collection System Installation

Construction of the leachate collection system in Cell 2I began on December 20, 2010 and was completed on January 20, 2011. The leachate collection system construction started with geocomposite installation. Approximately 710,000 square feet of geocomposite was installed on the floor and sideslopes of Cell 2I. The geocomposite was installed directly on top of the 60-mil HDPE geomembrane. The leachate collection perforated pipes were surrounded by No. 57 stone and encapsulated with geotextile. In addition, two (2) aggregate filled leachate collection sumps with two (2) 24-inch diameter HDPE riser pipes per sump were installed. Protective cover material was placed directly on top of the geocomposite. Approximately 54,000 cubic yards of protective cover material was placed on the floor and sideslopes of Cell 2I.

A record drawing showing the final grades of the protective cover material, entitled "Topographic Survey of the Verified Protective Cover" was provided to ACC by LA and is presented as Figure 4. A record drawing showing the final as-built conditions of the leachate collection pipes and sumps, entitled "As-built Conditions of Leachate Collection System" was provided to ACC by LA and is presented as Figure 5. In addition, LA provided ACC with three drawings that included a survey point number location drawing (Sheet 1) and two survey point data table drawings (Sheets 2 and 3). These drawings are entitled "Verification Survey of CMS Cell 2I (Sheets 1 to 3)" and are collectively presented as Figure 6.

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SECTION 3

CQA During Prepared Subgrade and Structural Fill Construction

SECTION 3
CQA During Prepared Subgrade and Structural Fill Construction

3.1 Project Specifications

In general, the Project Specifications require that: i) subgrade be proof-rolled prior to any fill placement of soils materials; ii) structural fill material will be used to establish elevations for the containment system after proof-rolling of the exposed surface is performed; iii) the structural fill material will be tested to determine the moisture/density relationship through laboratory testing and to evaluate the degree of compaction through field density testing; and iv) the structural fill material is to be placed in 6-inch thick compacted lifts and compacted to a minimum of 95 percent of the Standard Proctor (ASTM D698) maximum dry density.

The Project Specifications provided specific frequencies and acceptance criteria for both field and laboratory testing of the structural fill material.

3.2 Laboratory Testing

During the structural fill construction, representative samples of that material were obtained from the proposed borrow sources for detailed laboratory testing. A total of four (4) samples were obtained. The samples were labeled SF-1 through SF-4. The laboratory testing program was comprised of standard Proctor moisture/density relationship ASTM D698. The laboratory results for this testing are presented in Appendix D.

3.3 Field Density Testing

Field density testing of the structural fill was performed by the ACC Resident Manager using a nuclear density gauge (ASTM D2922) and met the required frequency listed in the Project Specifications.

In the event that a density test or moisture reading failed to meet the Project Specifications, remedial work was undertaken within the area represented by the failed test. The remedial work typically consisted of a bulldozer tracking up the soil material, allowing time for drying, and then using a compactor recompacting the material. After the remedial work was complete, the area was retested. This procedure was repeated until a passing result was achieved.

A total of 297 passing field density tests were performed during the placement of the structural fill material. The results of the density testing of the structural fill material are summarized in Appendix E. The tests are identified with the prefix SF.

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SECTION 4

CQA During Compacted Soil Liner Construction

SECTION 4
CQA During Compacted Soil Liner Construction

4.1 Project Specifications

In general, the Project Specifications for the compacted soil liner material for Cell 2I require that: i) a minimum 2-foot thick compacted soil liner be placed with a maximum permeability of 1.0 x 10^{-7} cm/sec; ii) preconstruction laboratory testing be performed to establish an acceptable range of moisture/density values which will result in achieving the required permeability (the acceptable range was subsequently determined to have a degree of compaction equal to or greater than 98 percent of the maximum dry density at or above three percent wet of the optimum moisture content); and, iii) loose lift thickness shall not exceed 8 inches to yield a final minimum 6-inch compacted thickness.

The Project Specifications provided frequencies and acceptance criteria for both field and laboratory testing of the liner base.

4.2 Preconstruction Testing

Prior to the use of any borrow source as construction material for the compacted soil liner, representative samples of that material were obtained from the proposed borrow source for detailed laboratory testing. A total of 8 samples were obtained. The samples were labeled PC-1 through PC-8. The laboratory testing program was comprised of standard Proctor moisture/density relationship ASTM D698, particle size analysis ASTM D422, Atterberg Limits ASTM D4318, remolded permeability ASTM D5084, classification ASTM D2487 and moisture content ASTM D2216.

The preconstruction laboratory testing met the required frequency and the results of this testing are presented in Appendix F, Section F-1.

Prior to the start of compacted soil liner placement, a test pad was constructed using the compacted soil liner material and proposed compaction methods in order to confirm the proposed borrow source would meet the project requirements for the compacted soil liner material. As required by the Project Specifications, Shelby tube samples and in-place density testing were all performed on the test pad. The detailed laboratory testing data for the Shelby tube samples that were taken from the test pad area; as well as the field density test data for the test pad are presented in Appendix F, Sections F-2 and F-3, respectively.

4.3 Testing During Construction

As required by the Project Specifications, bulk laboratory test samples, Shelby tube samples, gradation bag samples and in-place field density testing were all performed on the placed compacted soil liner within the limits of Cell 2I. As a result, ACC obtained a total of 8 bulk laboratory samples and 72 Shelby tube samples and 160 bag gradation samples for laboratory

testing. All of the samples met the project specifications. The results of the laboratory tests performed during construction are presented in Appendix G, Sections G-1, G-2 and G-3 respectively.

Field density testing of the compacted soil liner was performed by the ACC Resident Manager using a nuclear density gauge (ASTM D2922) and met a frequency of one test per 10,000 square feet per lift of placed material. In accordance with the Project Specifications, the drive cylinder method (ASTM D2937) was used to verify the performance of the nuclear gauge.

In the event that a density test or moisture reading failed to meet the target moisture/ density, remedial work was undertaken within the area represented by the failed test. The remedial work typically consisted of a bulldozer tracking up the liner base material, allowed time for drying, and then a compactor recompacting the material. After the remedial work was complete, the area was retested. This procedure was repeated until a passing result was achieved.

A total of 321 passing field density tests were performed during the placement of the compacted soil liner material. The results of the field density testing, denoted with the prefix CL, are summarized in Appendix G, Section G-4.

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SECTION 5

Geosynthetic Conformance Test Results and Manufacturers' Quality Control Submittals

SECTION 5
Geosynthetic Conformance Test Results and Manufacturers' Quality Control Submittals

5.1 Geomembrane

Samples of the 60-mil thick HDPE geomembrane materials used for Cell 2I 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 710,000 square feet of 60-mil thick HDPE geomembrane material was delivered to 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 H, Section H-1. A summary of the quality control data for the geomembrane material is provided in Appendix I, Section I-1.

5.2 Geocomposite

Samples of the geocomposite material used for Cell 2I 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 710,000 square feet of geocomposite material was delivered to 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 H, Section H-2. A summary of the quality control data for the geocomposite material is provided in Appendix I, Section I-2.

5.3 Geotextile

Samples of the geotextile materials used for Cell 2I 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 50,000 square feet of geotextile material was delivered to the site. The tests were performed in accordance with the standard test procedures defined in the Project Specifications.

The quality control data was 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 quality control data for the geotextile material is provided in Appendix I, Section I-3.

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SECTION 6

Geosynthetics Installation Monitoring

SECTION 6
Geosynthetics Installation Monitoring

The ACC monitoring staff during the geosynthetics installation in Cell 2I consisted of the Resident Manager and one Geosynthetics Monitor.

The CQA monitoring services that ACC provided consisted of:

- Review of conformance test data and the geosynthetic manufacturers' quality control certificates for the geomembrane, geocomposite and geotextile materials;
- 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 2I geosynthetics installation have been included in Appendices J through R.

6.1 Deployment Monitoring

During deployment of the geomembrane panels for Cell 2I, ESI signed Certificates of Acceptance of Soil Surface, which are presented in Appendix J. 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-151 inclusive. Deployment of the geomembrane 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 geomembrane liner for Cell 2I 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 2I is presented as Figure 3. A summary of the geomembrane panel deployment monitoring log is presented in Appendix K.

6.2 Trial Seam Monitoring

Geomembrane trial seaming was performed by the ESI technicians approximately every 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 L.

6.3 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 M.

6.4 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 N and O, respectively.

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

6.5 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 the Owner 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 120 pounds per inch of specimen width. The strength criteria for peel testing was that specimens must have yield strengths greater than or equal to 91 pounds per inch of specimen width for fusion welding and that specimens must have yield strengths greater than or equal to 78 pounds per inch of specimen width for extrusion welding. 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 seventy-eight (78) initial seam destructive samples were obtained from approximately 34,230 linear feet of completed fusion seams. This results in an average testing frequency of one test per 439 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 nine (9) destructive samples were obtained from approximately 3,450 linear feet of extrusion seams associated with the geomembrane repairs. This results in an average testing frequency of one test per 384 linear feet of extrusion welding. All of the extrusion test samples met or exceeded the required test values per the Project Specifications.

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

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SECTION 7

Leachate Collection System Construction

SECTION 7
Leachate Collection System Construction

During the leachate collection system construction in Cell 2I, 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.

7.1 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 twenty (20) samples were obtained. The samples were labeled PS-1 through PS-20. The laboratory testing program was comprised of particle size analysis ASTM D422, standard Proctor moisture/density relationship ASTM D698 and remolded permeability ASTM D5084. The laboratory testing met the requirements of the Project Specifications. The results of this testing are presented in Appendix S.

7.2 Leachate Collection Lines and Gravel Material Testing

There are two (2) sumps in Cell 2I and the floor is contoured to direct leachate flow toward them. Each sump is feed by a single 8-inch diameter leachate collection pipe which is surrounded by No. 57 stone and then burrito wrapped in an 8-ounce non-woven geotextile per the Project Specifications. A sample of the No. 57 stone material was obtained and tested per the Project Specifications. The laboratory testing met the requirements of the Project Specifications. The results of this testing are presented in Appendix T.

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SECTION 8

Record Surveys

SECTION 8
Record Surveys

Record ("as-built") surveys were conducted during Cell 2I construction by a Registered Professional Land Surveyor (North Carolina) from Lawrence Associates, PA to certify that the thickness, lines, grades and survey tolerances for the structural fill, compacted soil liner and protective cover layers met the Project Specifications. The surveys were conducted using a system of field stakes that represented critical points in defining the shape of Cell 2I. As mentioned previously, the survey drawings were provided to ACC by LA and are included in this report as Figures 1, 2, 4, 5 and 6.

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SECTION 9

Certification

SECTION 9
Certification

ACC of North Carolina, LLC was retained by BFI Waste Systems of North America, Inc., a wholly owned subsidiary or Republic Services, Inc., to provide CQA services during the construction of Cell 2I at the Charlotte Motor Speedway Landfill V located in Cabaurrus County, North Carolina. Services rendered consisted of construction quality assurance monitoring and testing during construction of the prepared subgrade, structural fill, 2-foot thick, low permeability compacted soil liner, 60-mil geomembrane liner and the associated leachate collection system. The ACC Registered Professional Engineer (North Carolina) performed on-site visits and reviewed the work during construction.

Based on the results of the CQA activities performed by ACC and described in this report, I certify that Cell 2I 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

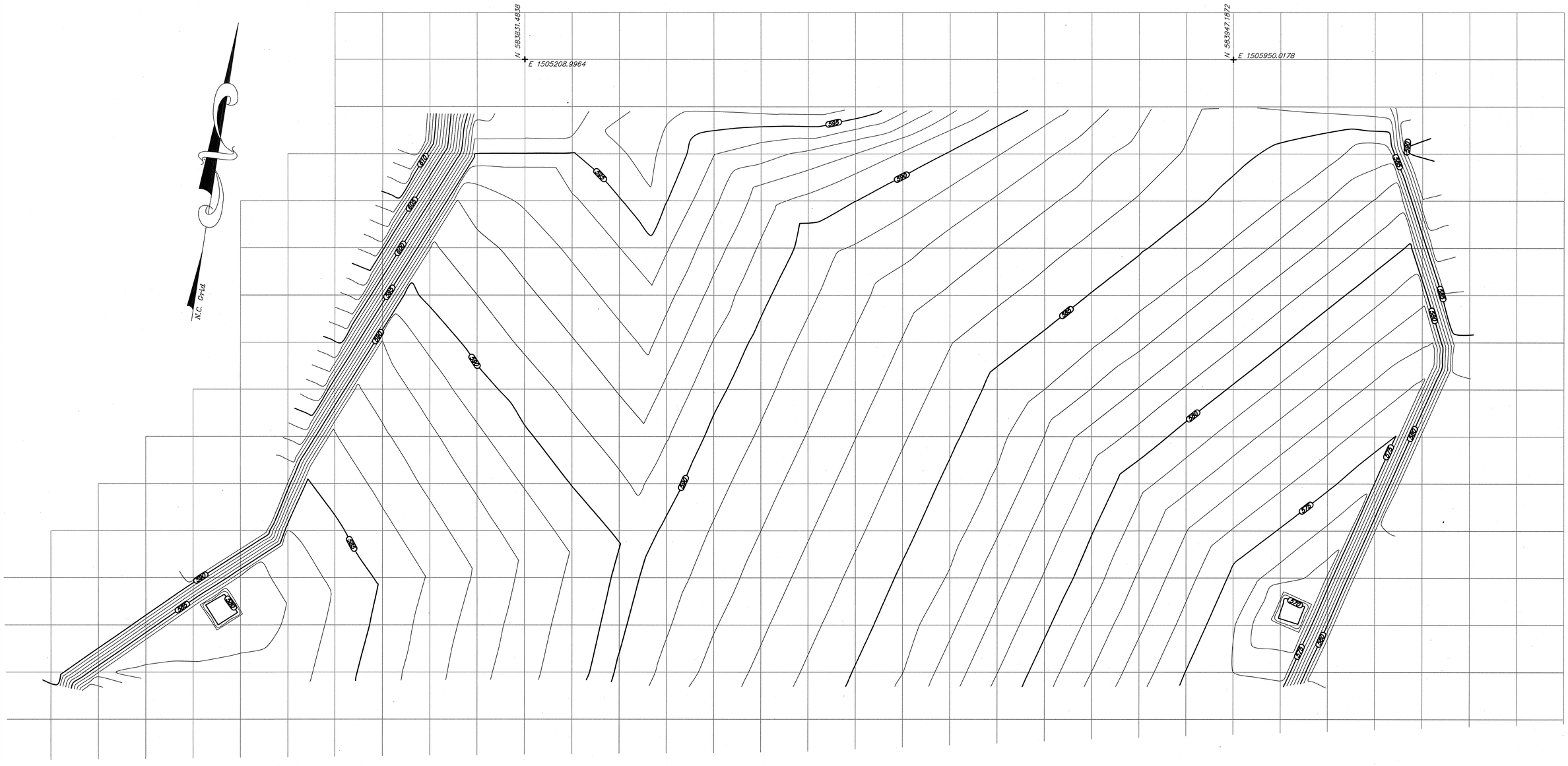
2/10/11

RSC/RTD:ods

of NORTH CAROLINA, LLC

Figures

Cell 2-H



NORTH CAROLINA PROFESSIONAL SEAL L-1290 LAND SURVEYOR F. DONALD LAWRENCE
12/9/10

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

LAWRENCE ASSOCIATES
106 W. Jefferson St.
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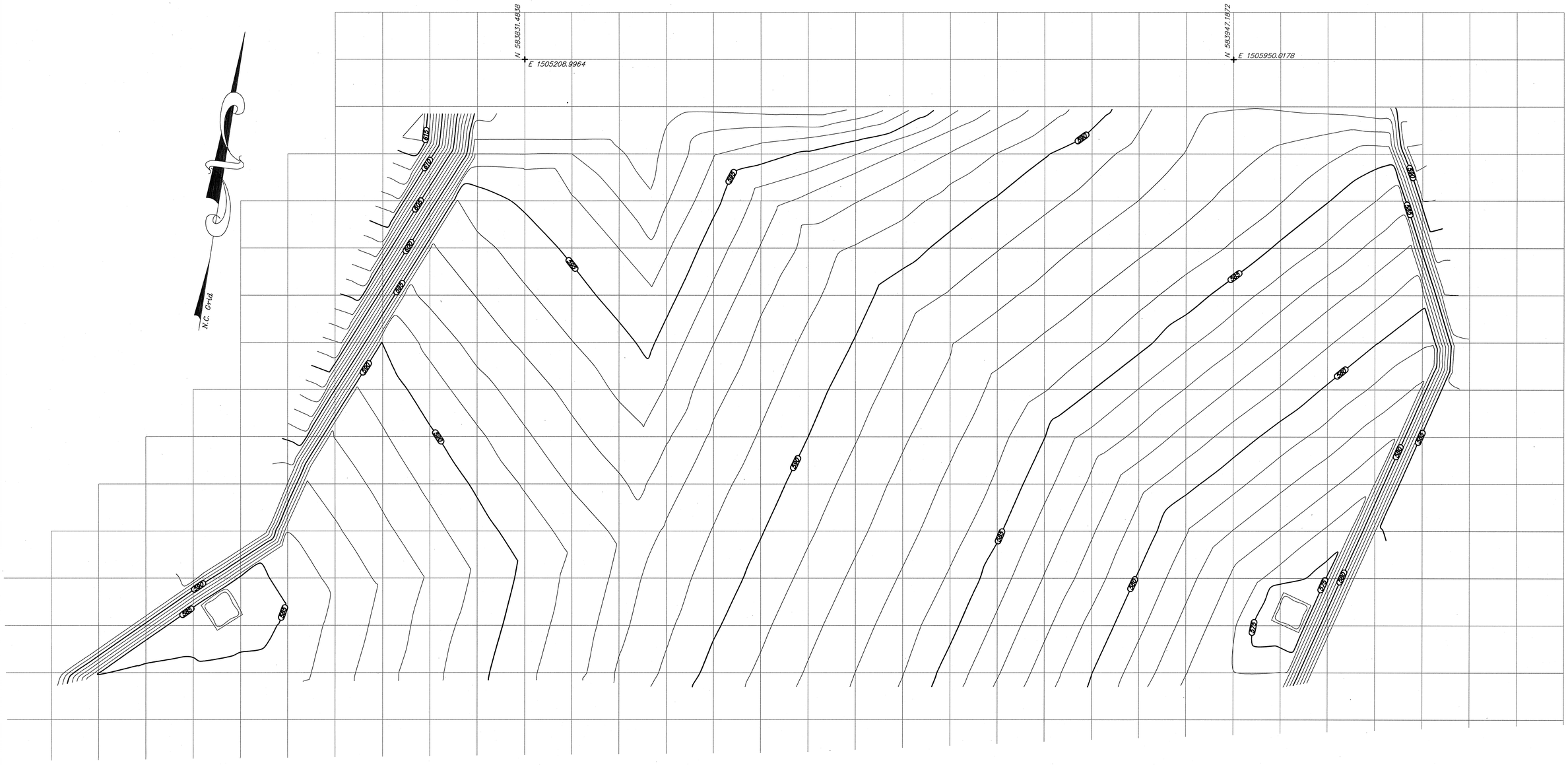
Topographic Survey of the Verified Subgrade
CMS Cell 2-I
Cabarrus County, N.C.

REVISIONS

Orig. scale: 1" = 50' Date: December 9, 2010 Drawn By: MCM

Job No. 0135-2I Drawing file: Cell 2I Verified Subgrade--Contours.dwg Drawing no. 10/136

Cell 2-H



NORTH CAROLINA PROFESSIONAL SEAL L-1230 LAND SURVEYOR F. DONALD LAWRENCE 12/9/10

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

LAWRENCE ASSOCIATES
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F 704-283-9035
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Topographic Survey of the Verified Clay
CMS Cell 2-I
Cabarrus County, N.C.

REVISIONS

Orig. scale: 1" = 50' Date: December 9, 2010 Drawn By: MCM

Job No. 0135-21 Drawing file: Cell 21 Top of Clay.dwg Drawing no. 10/134

N.T.S

SCALE: 1"=50' (IN FEET)

ATLANTIC COAST CONSULTING, INC.
630 Colonial Park Drive
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PROJECT:
CHARLOTTE MOTOR SPEEDWAY LANDFILL CELL 2I CONSTRUCTION

REPUBLIC SERVICES, INC.

5105 Morehead Road
Concord, North Carolina 28027
(704) 782-2004, ext. 391

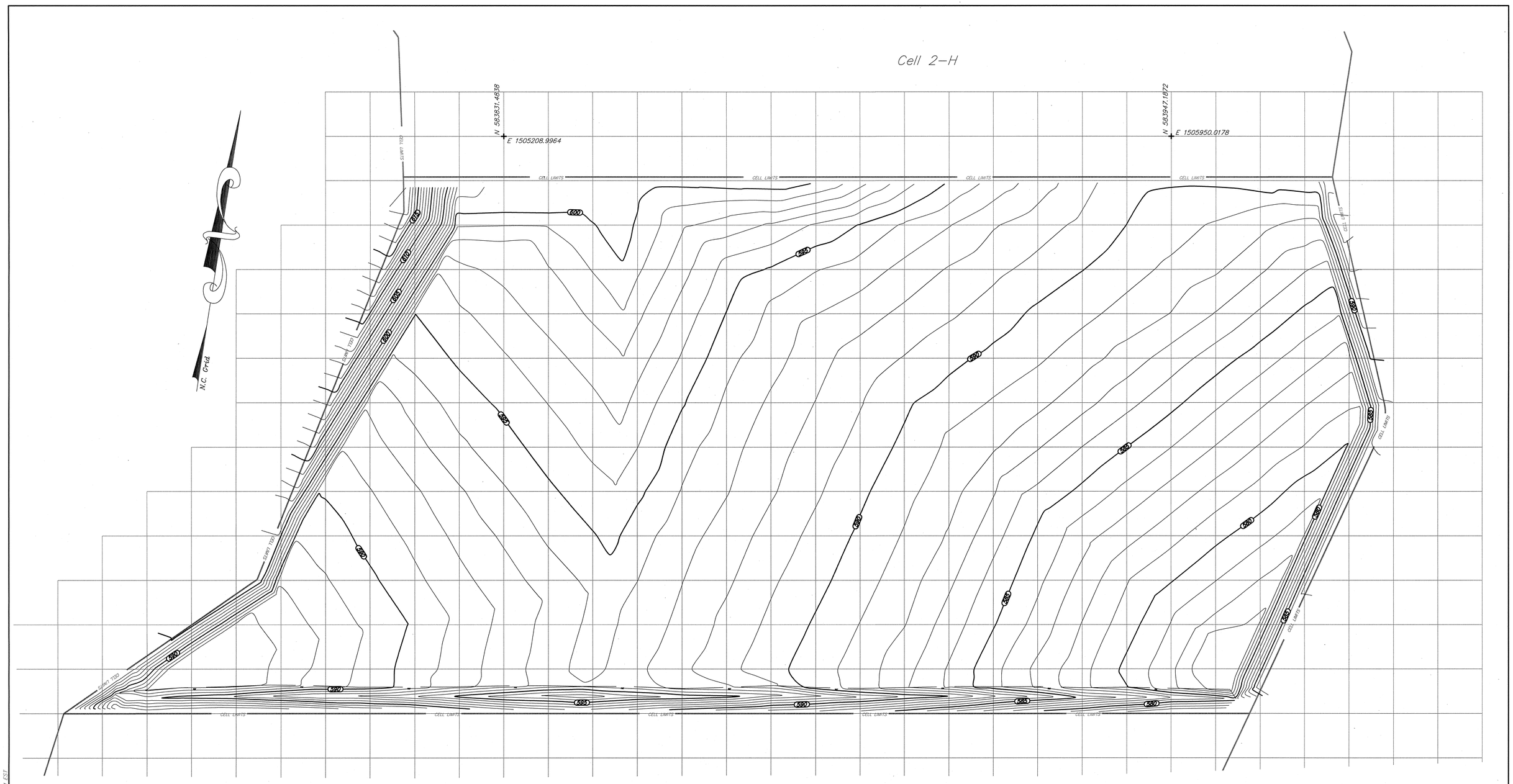
REVISIONS

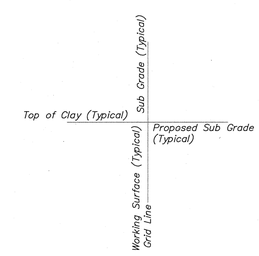
Drawn by: MM

Checked by: SC

PROJECT NUMBER:
I001-154
September 2010

HDPE Panel Layout Sketch





NORTH CAROLINA PROFESSIONAL SEAL LAWRENCE SURVEYOR F. DONALD LAWRENCE 2/9/11

LAWRENCE ASSOCIATES
106 W. Jefferson St.
Monroe, North Carolina 28112
P 704-289-1013 866-557-8051
F 704-283-9035
www.lawrencesurveying.com

Topographic survey
Verified Protective Cover Surface, CMS Landfill V Cell 2-I Construction
Cabarrus County, N.C.

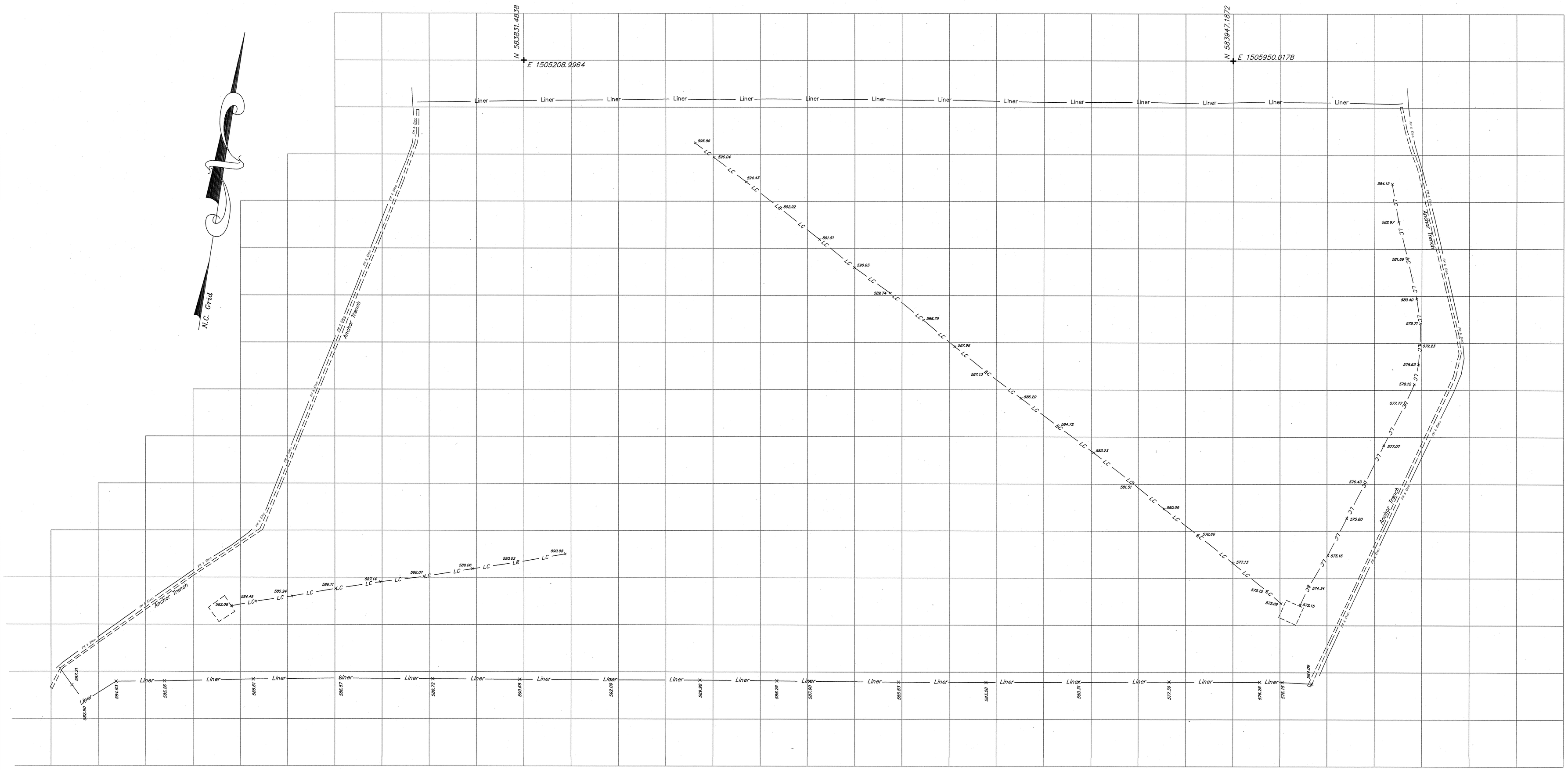
Orig. scale: 1" = 50' Date: February 3, 2011 Drawn By: MCM

REVISIONS
MCM 2-8-11

Job No. 0135-2I Drawing file: Cell 2I Working Surface-Contours.dwg Drawing no. 11/010

C:\proj\0135 - 2I\Cell 2I Working Surface-Contours.dwg 2/8/2011 10:46:34 AM EST

Cell 2-H


N. C. Grid
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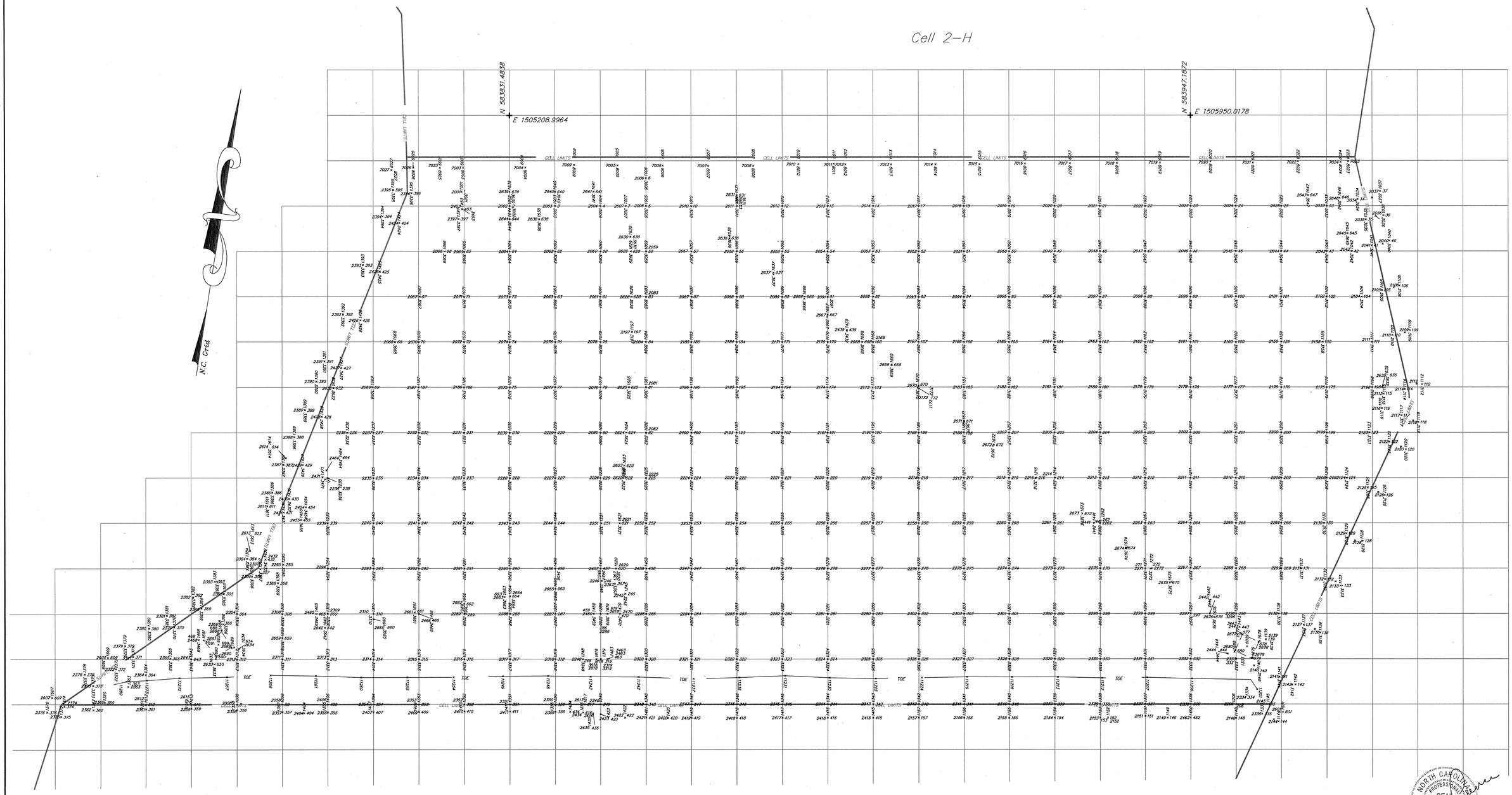
E 1505208.9964
N 583947.1872
E 1505950.0178
Liner
LC
Anchor Trench
24 Ldpe
24 Ldpe
24 Ldpe



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Top of Clay (Typical) — Sub Grade (Typical)

Proposed Sub Grade (Typical) — Working Surface (Typical) Grid Line

NORTH CAROLINA PROFESSIONAL SEAL L-1380 LAND SURVEYOR RONALD LAWRENCE

2/9/11

LAWRENCE ASSOCIATES
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Sheet 1

Verification Survey of
CMS Landfill V Cell 2-I Construction
Cabarrus County, N.C.

Orig. scale: 1" = 50' Date: February 2, 2011 Drawn By: MCM

REVISIONS
MCM 2-8-11

Job No. 0135-21 Drawing file: Cell 21 Working Surface.dwg Drawing no. 11/009

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Proposed Subgrade		Verified Subgrade		Proposed-Verified	Verified Top of Clay		Subgrade-Top of Clay	Verified Protective Cover		Clay-Protective Cover
PT#	Elevation	PT#	Elevation	Difference	PT#	Elevation	Difference	PT#	Elevation	Difference
1	596.00	1001	595.99	−0.01	2001	598.03	2.04	3001	600.20	2.17
2	594.95	1002	594.94	−0.01	2002	597.02	2.08	3002	599.03	2.02
3	594.95	1003	594.93	−0.02	2003	597.01	2.08	3003	599.13	2.12
4	595.88	1004	595.88	0.00	2004	597.90	2.03	3004	599.93	2.03
5	595.71	1005	595.72	0.01	2005	597.80	2.08	3005	599.88	2.08
6	596.00	1006	596.01	0.01	2006	598.04	2.03	3006	600.12	2.09
7	596.30	1007	596.30	0.00	2007	598.33	2.03	3007	600.45	2.12
8	583.52	1008	583.54	0.02	2008	585.59	2.05	Interim	Berm	No Cover
10	594.00	1010	594.02	0.02	2010	596.06	2.04	3010	598.14	2.08
11	593.44	1011	593.44	0.00	2011	595.45	2.01	3011	597.59	2.13
12	592.67	1012	592.67	0.00	2012	594.76	2.09	3012	596.84	2.08
13	591.70	1013	591.72	0.01	2013	593.78	2.06	3013	595.84	2.06
14	590.77	1014	590.76	−0.01	2014	592.83	2.07	3014	594.93	2.10
17	589.73	1017	589.72	−0.01	2017	591.76	2.03	3017	593.83	2.07
18	588.90	1018	588.91	0.01	2018	590.96	2.05	3018	593.05	2.09
19	588.05	1019	588.05	0.00	2019	590.07	2.03	3019	592.09	2.02
20	587.30	1020	587.29	−0.01	2020	589.36	2.08	3020	591.45	2.08
21	586.60	1021	586.61	0.01	2021	588.64	2.03	3021	590.76	2.12
22	585.90	1022	585.90	0.00	2022	587.95	2.06	3022	589.98	2.03
23	585.32	1023	585.30	−0.02	2023	587.36	2.06	3023	589.48	2.11
24	584.74	1024	584.74	0.00	2024	586.79	2.04	3024	588.85	2.06
25	584.16	1025	584.18	0.02	2025	586.24	2.06	3025	588.29	2.05
33	583.66	1033	583.66	0.00	2033	585.68	2.02	3033	587.81	2.13
34	590.00	1034	590.00	0.00	2034	592.02	2.01	3034	594.19	2.17
35	590.00	1035	589.99	−0.01	2035	592.09	2.10	3035	594.14	2.05
36	590.00	1036	590.00	0.00	2036	592.03	2.03	3036	594.05	2.02
37	590.00	1037	590.01	0.01	2037	592.06	2.05	3037	594.06	2.00
40	589.15	1040	589.15	0.00	2040	591.23	2.08	3040	593.25	2.03
41	589.13	1041	589.14	0.01	2041	591.20	2.06	3041	593.26	2.06
42	581.39	1042	581.38	−0.01	2042	583.46	2.07	3042	585.61	2.15
43	581.95	1043	581.94	−0.01	2043	584.01	2.07	3043	586.08	2.06
44	582.99	1044	582.99	−0.01	2044	585.04	2.06	3044	587.15	2.11
45	584.02	1045	584.02	0.00	2045	586.06	2.04	3045	588.15	2.09
46	584.64	1046	584.63	−0.01	2046	586.68	2.04	3046	588.76	2.09
47	585.26	1047	585.28	0.02	2047	587.36	2.08	3047	589.39	2.03
48	585.89	1048	585.89	0.01	2048	587.99	2.09	3048	590.03	2.04
49	586.52	1049	586.53	0.01	2049	588.60	2.07	3049	590.66	2.06
50	587.15	1050	587.17	0.02	2050	589.24	2.07	3050	591.26	2.01
51	587.78	1051	587.79	0.01	2051	589.88	2.08	3051	591.90	2.02
52	588.49	1052	588.49	0.00	2052	590.56	2.07	3052	592.69	2.13
53	589.33	1053	589.34	0.01	2053	591.39	2.05	3053	593.52	2.13
54	589.86	1054	589.88	0.02	2054	591.97	2.08	3054	594.05	2.08
55	590.66	1055	590.68	0.02	2055	592.75	2.07	3055	594.88	2.13
56	591.54	1056	591.56	0.02	2056	593.64	2.07	3056	595.64	2.01
57	593.17	1057	593.17	0.00	2057	595.27	2.09	3057	597.34	2.07
58	583.78	1058	583.81	0.03	2058	585.82	2.02	Interim	Berm	No Cover
59	595.02	1059	595.02	0.00	2059	597.08	2.06	3059	599.18	2.10
60	594.91	1060	594.92	0.01	2060	596.96	2.03	3060	599.06	2.11
61	593.96	1061	593.98	0.02	2061	596.01	2.03	3061	598.16	2.15
62	593.82	1062	593.83	0.01	2062	595.87	2.04	3062	597.92	2.05
63	593.19	1063	593.19	0.00	2063	595.21	2.02	3063	597.35	2.14
64	593.12	1064	593.13	0.01	2064	595.17	2.05	3064	597.24	2.06
65	592.53	1065	592.53	0.00	2065	594.57	2.04	3065	596.80	2.22
66	591.94	1066	591.96	0.02	2066	593.96	2.01	3066	596.11	2.15
67	590.86	1067	590.87	0.01	2067	592.91	2.04	3067	595.01	2.10
68	589.71	1068	589.70	−0.01	2068	591.74	2.04	3068	593.91	2.17
69	587.96	1069	587.96	0.00	2069	590.00	2.04	3069	592.17	2.18
70	590.23	1070	590.24	0.01	2070	592.27	2.03	3070	594.35	2.08
71	591.63	1071	591.65	0.02	2071	593.68	2.03	3071	595.79	2.11
72	591.01	1072	590.99	−0.02	2072	593.04	2.05	3072	595.18	2.13
73	592.41	1073	592.41	0.00	2073	594.49	2.08	3073	596.63	2.14
74	591.78	1074	591.79	0.01	2074	593.84	2.05	3074	595.88	2.04
75	591.15	1075	591.17	0.02	2075	593.20	2.02	3075	595.21	2.02
76	592.56	1076	592.55	−0.01	2076	594.61	2.05	3076	596.68	2.07
77	591.92	1077	591.93	0.01	2077	593.97	2.04	3077	596.03	2.06
78	593.33	1078	593.35	0.02	2078	595.37	2.02	3078	597.42	2.05
79	592.69	1079	592.70	0.01	2079	594.71	2.02	3079	596.77	2.06
80	592.06	1080	592.08	0.02	2080	594.17	2.09	3080	596.23	2.07
81	592.54	1081	592.56	0.02	2081	594.59	2.03	3081	596.67	2.08
82	591.79	1082	591.80	0.01	2082	593.89	2.09	3082	596.01	2.12
83	594.10	1083	594.10	0.00	2083	596.14	2.04	3083	598.22	2.08
84	593.31	1084	593.30	−0.01	2084	595.38	2.08	3084	597.43	2.05
87	592.40	1087	592.39	−0.01	2087	594.48	2.08	3087	596.56	2.09
88	590.85	1088	590.86	0.01	2088	592.93	2.07	3088	594.95	2.02
89	589.62	1089	589.63	0.01	2089	591.68	2.05	3089	593.79	2.11
91	588.91	1091	588.91	0.00	2091	590.92	2.01	3091	593.04	2.13
92	588.31	1092	588.31	0.00	2092	590.40	2.08	3092	592.45	2.05
93	587.61	1093	587.62	0.01	2093	589.68	2.06	3093	591.74	2.06
94	586.98	1094	586.98	0.00	2094	589.05	2.06	3094	591.16	2.11
95	586.35	1095	586.35	0.00	2095	588.40	2.05	3095	590.51	2.11
96	585.73	1096	585.74	0.01	2096	587.77	2.03	3096	589.79	2.02
97	585.10	1097	585.11	0.01	2097	587.18	2.07	3097	589.26	2.08
98	584.48	1098	584.49	0.01	2098	586.59	2.10	3098	588.64	2.05
99	583.76	1099	583.77	0.01	2099	585.86	2.08	3099	587.96	2.11
100	582.72	1100	582.74	0.01	2100	584.78	2.05	3100	586.95	2.16
101	581.69	1101	581.70	0.02	2101	583.80	2.10	3101	585.84	2.04
102	580.65	1102	580.65	0.00	2102	582.71	2.06	3102	584.75	2.04
104	579.82	1104	579.84	0.02	2104	581.88	2.04	3104	584.06	2.18
105	587.63	1105	587.62	−0.01	2105	589.66	2.04	3105	591.68	2.02
106	587.64	1106	587.61	−0.03	2106	589.64	2.03	3106	591.80	2.16
109	586.15	1109	586.18	0.03	2109	588.21	2.03	3109	590.26	2.05
110	586.12	1110	586.11	−0.01	2110	588.14	2.03	3110	590.18	2.04
111	578.26	1111	578.28	0.02	2111	580.33	2.05	3111	582.41	2.07
112	584.87	1112	584.88	0.01	2112	586.99	2.10	3112	589.07	2.08
114	584.70	1114	584.72	0.02	2114	586.73	2.01	3114	588.84	2.11
115	576.80	1115	576.80	0.00	2115	578.83	2.03	3115	580.90	2.07
116	576.28	1116	576.30	0.02	2116	578.33	2.02	3116	580.48	2.15
117	584.00	1117	584.00	0.00	2117	586.07	2.07	3117	588.13	2.06
118	584.00	1118	583.99	−0.01	2118	586.08	2.08	3118	588.15	2.07
120	583.82	1120	583.84	0.02	2120	585.89	2.05	3120	587.95	2.06
122	583.82	1122	583.82	0.00	2122	585.83	2.02	3122	587.86	2.03
123	575.76	1123	575.76	0.00	2123	577.82	2.05	3123	579.91	2.09
124	574.97	1124	574.98	0.01	2124	577.03	2.04	3124	579.12	2.10
125	583.52	1125	583.53	0.01	2125	585.55	2.02	3125	587.63	2.08
126	583.52	1126	583.53	0.01	2126	585.61	2.08	3126	587.65	2.04
128	583.21	1128	583.21	0.00	2128	585.25	2.04	3128	587.35	2.10
129	583.21	1129	583.22	0.01	2129	585.23	2.01	3129	587.31	2.09
130	574.19	1130	574.18	−0.01	2130	576.23	2.05	3130	578.37	2.14
131	573.33	1131	573.32	−0.01	2131	575.35	2.03	3131	577.53	2.17
132	582.90	1132	582.86	−0.04	2132	584.88	2.02	3132	587.02	2.14
133	582.90	1133	582.92	0.02	2133	584.97	2.05	3133	587.02	2.05
136	582.60	1136	582.57	−0.03	2136	584.64	2.07	3136	586.64	2.00
137	582.60	1137	582.60	0.00	2137	584.70	2.09	3137	586.71	2.02
138	572.50	1138	572.52	0.02	2138	574.55	2.03	3138	576.69	2.14
139	572.00	1139	571.99	−0.01	2139	574.04	2.06	3139	576.19	2.15
140	572.00	1140	572.01	0.01	2140	574.05	2.04	3140	576.06	2.01
141	582.25	1141	582.17	−0.08	2141	584.30	2.13	3141	586.38	2.08
142	582.25	1142	582.25	0.00	2142	584.33	2.08	3142	586.41	2.08
144	582.00	1144	582.02	0.02	2144	584.02	2.00	Interim	Berm	No Cover
145	582.07	1145	582.08	0.01	2145	584.17	2.09	Interim	Berm	No Cover
148	574.00	1148	574.00	0.00	2148	576.06	2.05	Interim	Berm	No Cover
149	574.00	1149	574.02	0.02	2149	576.05	2.03	Interim	Berm	No Cover
151	574.81	1151	574.81	0.00	2151	576.86	2.05	Interim	Berm	No Cover
152	576.00	1152	576.00	0.00	2152	578.03	2.03	Interim	Berm	No Cover
153	576.26	1153	576.26	0.00	2153	578.33	2.07	Interim	Berm	No Cover
154	577.77	1154	577.77	0.00	2154	579.87	2.10	Interim	Berm	No Cover
155	579.29	1155	579.29	0.00	2155	581.35	2.05	Interim	Berm	No Cover
156	580.79	1156	580.80	0.01	2156	582.87	2.07	Interim	Berm	No Cover
157	582.32	1157	582.33	0.01	2157	584.42	2.09	Interim	Berm	No Cover
158	579.42	1158	579.44	0.02	2158	581.50	2.06	3158	583.55	2.05
159	580.38	1159	580.38	0.00	2159	582.41	2.03	3159	584.49	2.08
160	581.42	1160	581.41	−0.01	2160	583.43	2.03	3160	585.49	2.06
161	582.46	1161	582.46	0.00	2161	584.47	2.01	3161	586.52	2.05
162	583.50	1162	583.49	0.00	2162	585.52	2.02	3162	587.54	2.02
163	584.32	1163	584.32	0.00	2163	586.35	2.03	3163	588.44	2.09
164	584.94	1164	584.94	0.00	2164	586.99	2.05	3164	589.15	2.16
165	585.57	1165	585.59	0.02	2165	587.66	2.07	3165	589.73	2.07
166	586.19	1166	586.19	0.00	2166	588.25	2.06	3166	590.27	2.02
167	586.81	1167	586.83	0.02	2167	588.90	2.07	3167	590.94	2.04
168	587.43	1168	587.45	0.01	2168	589.48	2.03	3168	591.51	2.03
170	588.28	1170	588.28	0.00	2170	590.36	2.08	3170	592.42	2.05
171	589.19	1171	589.19	0.00	2171	591.24	2.05	3171	593.35	2.11
172	586.05	1172	586.05	0.01	2172	588.12	2.07	3172	590.19	2.07
173	586.96	1173	586.95	−0.01	2173	589.00	2.05	3173	591.07	2.07
174	587.87	1174	587.86	0.00	2174	589.94	2.08	3174	591.97	2.03
175	578.04	1175	578.03	−0.01	2175	580.07	2.03	3175	582.11	2.04
176	579.08	1176	579.08	0.00	2176	581.13	2.05	3176	583.18	2.05
177	580.12	1177	580.13	0.01	2177	582.17	2.04	3177	584.23	2.06
178	581.16	1178	581.17	0.01	2178	583.24	2.07	3178	585.29	2.06
179	582.18	1179	582.20	0.02	2179	584.24	2.04	3179	586.31	2.07
180	583.23	1180	583.24	0.01	2180	585.32	2.07	3180	587.35	2.03
181	584.16	1181	584.17	0.01	2181	586.26	2.09	3181	588.30	2.05
182	584.79	1182	584.79	0.00	2182	586.82	2.03	3182	588.90	2.07
183	585.40	1183	585.40	0.00	2183	587.49	2.09	3183	589.56	2.06
184	590.16	1184	590.18	0.02	2184	592.22	2.04	3184	594.29	2.06
185	591.67	1185	591.67	0.00	2185	593.76	2.08	3185	595.89	2.14
186	590.37	1186	590.37	0.00	2186	592.41	2.04	3186	594.49	2.08
187	589.30	1187	589.29	−0.01	2187	591.31	2.02	3187	593.38	2.07

Proposed Subgrade		Verified Subgrade		Proposed-Verified	Verified Top of Clay		Subgrade-Top of Clay	Verified Protective Cover		Clay-Protective Cover
PT#	Elevation	PT#	Elevation	Difference	PT#	Elevation	Difference	PT#	Elevation	Difference
188	584.72	1188	584.72	0.00	2188	586.75	2.04	3188	588.81	2.06
189	585.62	1189	585.62	0.00	2189	587.69	2.07	3189	589.76	2.07
190	586.53	1190	586.54	0.01	2190	588.58	2.04	3190	590.68	2.09
191	587.44	1191	587.44	0.00	2191	589.47	2.03	3191	591.54	2.08
192	588.35	1192	588.36	0.01	2192	590.40	2.04	3192	592.44	2.05
193	589.27	1193	589.29	0.02	2193	591.30	2.01	3193	593.35	2.05
194	588.77	1194	588.76	−0.01	2194	590.79	2.02	3194	592.84	2.05
195	589.67	1195	589.66	−0.01	2195	591.71	2.05	3195	593.82	2.11
196	590.97	1196	590.95	−0.02	2196	593.02	2.08	3196	595.10	2.08
197	594.00	1197	594.01	0.01	2197	596.02	2.02	3197	598.11	2.08
198	577.17	1198	577.17	0.00	2198	579.18	2.01	3198	581.21	2.03
199	576.74	1199	576.74	0.01	2199	578.82	2.08	3199	580.93	2.11
200	577.78	1200	577.78	0.00	2200	579.84	2.07	3200	581.89	2.05
201	578.81	1201	578.82	0.01	2201	580.91	2.09	3201	582.94	2.03
202	579.85	1202	579.86	0.00	2202	581.90	2.05	3202	584.01	2.11
203	580.89	1203	580.89	0.00	2203	582.95	2.06	3203	584.99	2.04
204	581.93	1204	581.93	0.01	2204	583.96	2.03	3204	585.98	2.02
205	582.97	1205	582.96	0.00	2205	585.02	2.06	3205	587.09	2.07
206	574.00	1206	574.00	0.00	2206	576.02	2.02	Interim	Berm	No Cover
207	584.00	1207	584.00	0.00	2207	586.07	2.07	3207	588.13	2.06
208	575.43	1208	575.44	0.01	2208	577.46	2.03	3208	579.51	2.05
209	576.47	1209	576.48	0.01	2209	578.58	2.10	3209	580.63	2.05
210	577.51	1210	577.50	−0.01	2210	579.54	2.04	3210	581.61	2.07
211	578.54	1211	578.53	−0.02	2211	580.56	2.03	3211	582.65	2.09
212	579.58	1212	579.58	0.00	2212	581.63	2.05	3212	583.69	2.06
213	580.62	1213	580.65	0.02	2213	582.72	2.08	3213	584.77	2.04
214	581.66	1214	581.66	−0.01	2214	583.72	2.07	3214	585.78	2.05
215	583.00	1215	582.99	−0.01	2215	585.03	2.04	3215	587.10	2.07
216	582.08	1216	582.08	0.00	2216	584.09	2.02	3216	586.15	2.05
217	584.30	1217	584.29	−0.01	2217	586.34	2.04	3217	588.40	2.06
218	585.21	1218	585.20	0.00	2218	587.24	2.03	3218	589.31	2.07
219	586.11	1219	586.11	0.00	2219	588.14	2.03	3219	590.21	2.07
220	587.02	1220	587.02	0.00	2220	589.07	2.04	3220	591.16	2.09
221	587.93	1221	587.94	0.01	2221	590.00	2.06	3221	592.14	2.13
222	588.84	1222	588.86	0.02	2222	590.91	2.04	3222	593.06	2.16
224	589.75	1224	589.76	0.01	2224	591.81	2.05	3224	593.93	2.12
225	591.08	1225	591.09	0.01	2225	593.12	2.03	3225	595.24	2.12
226	591.43	1226	591.44	0.01	2226	593.51	2.08	3226	595.58	2.07
227	590.65	1227	590.67	0.02	2227	592.73	2.06	3227	594.82	2.08
228	589.82	1228	589.84	0.02	2228	591.85	2.01	3228	593.88	2.03
229	591.28	1229	591.29	0.01	2229	593.31	2.02	3229	595.43	2.12
230	590.51	1230	590.49	−0.02	2230	592.49	2.01	3230	594.61	2.12
231	589.60	1231	589.60	0.00	2231	591.61	2.02	3231	593.77	2.16
232	588.42	1232	588.44	0.02	2232	590.52	2.09	3232	592.66	2.14
233	588.78	1233	588.77	−0.01	2233	590.80	2.02	3233	592.86	2.06
234	587.76	1234	587.75	−0.01	2234	589.83	2.08	3234	591.86	2.03
235	586.85	1235	586.84	−0.01	2235	588.88	2.04	3235	590.95	2.06
236	586.89	1236	586.89	0.00	2236	588.94	2.05	3236	591.11	2.17
237	587.41	1237	587.40	−0.01	2237	589.43	2.03	3237	591.59	2.16
238	585.94	1238	585.95	0.01	2238	588.03	2.08	3238	590.12	2.10
239	585.37	1239	585.39	0.02	2239	587.42	2.04	3239	589.43	2.01
240	586.28	1240	586.28	0.00	2240	588.31	2.03	3240	590.39	2.08
241	587.20	1241	587.21	0.01	2241	589.24	2.03	3241	591.29	2.05
242	588.12	1242	588.11	−0.01	2242	590.16	2.06	3242	592.27	2.10
243	589.06	1243	589.05	−0.01	2243	591.11	2.06	3243	593.16	2.06
244	590.02	1244	590.04	0.02	2244	592.11	2.07	3244	594.18	2.07
245	590.00	1245	590.02	0.02	2245	592.07	2.05	3245	594.12	2.05
246	590.00	1246	590.00	0.00	2246	592.07	2.07	3246	594.12	2.06
247	588.91	1247	588.90	−0.01	2247	590.95	2.05	3247	593.03	2.08
248	590.00	1248	590.01	0.01	2248	592.07	2.07	3248	594.15	2.07
251	590.81	1251	590.82	0.01	2251	592.85	2.03	3251	594.93	2.08
252	590.36	1252	590.37	0.01	2252	592.39	2.01	3252	594.47	2.08
253	589.33	1253	589.32	−0.01	2253	591.34	2.02	3253	593.36	2.02
254	588.42	1254	588.42	0.00	2254	590.48	2.07	3254	592.59	2.11
255	587.51	1255	587.51	0.00	2255	589.56	2.04	3255	591.59	2.03
256	586.60	1256	586.61	0.00	2256	588.62	2.02	3256	590.71	2.09
257	585.70	1257	585.69	−0.01	2257	587.72	2.03	3257	589.82	2.10
258	584.79	1258	584.78	−0.01	2258	586.81	2.03	3258	588.92	2.11
259	583.80	1259	583.82	0.02	2259	585.85	2.04	3259	587.90	2.04
260	582.28	1260	582.29	0.00	2260	584.30	2.02	3260	586.35	2.05
261	580.77	1261	580.76	−0.01	2261	582.81	2.05	3261	584.83	2.02
262	579.32	1262	579.33	0.01	2262	581.35	2.02	3262	583.39	2.04
263	578.28	1263	578.28	0.00	2263	580.30	2.02	3263	582.37	2.06
264	577.24	1264	577.26	0.01	2264	579.29	2.04	3264	581.35	2.06
265	576.21	1265	576.22	0.01	2265	578.24	2.03	3265	580.29	2.05
266	575.22	1266	575.22	0.00	2266	577.26	2.04	3266	579.35	2.09
267	575.94	1267	575.94	0.00	2267	577.98	2.04	3267	580.11	2.13
268	574.91	1268	574.91	0.00	2268	576.94	2.03	3268	579.03	2.09
269	573.83	1269	573.83	0.00	2269	575.85	2.03	3269	577.95	2.10
270	578.56	1270	578.56	0.00	2270	580.59	2.03	3270	582.64	2.06
271	577.04	1271	577.03	−0.01	2271	579.08	2.05	3271	581.08	2.00
272	576.83	1272	576.84	0.01	2272	578.86	2.02	3272	580.91	2.05
273	580.07	1273	580.06	−0.01	2273	582.11	2.05	3273	584.24	2.13
274	581.59	1274	581.57	−0.01	2274	583.59	2.02	3274	585.66	2.06
275	583.10	1275	583.10	0.00	2275	585.17	2.07	3275	587.22	2.04
276	584.37	1276	584.36	0.00	2276	586.41	2.04	3276	588.49	2.08
277	585.28	1277	585.28	0.00	2277	587.34	2.06	3277	589.42	2.08
278	586.19	1278	586.19	0.00	2278	588.24	2.05	3278	590.32	2.08
279	587.09	1279	587.10	0.00	2279	589.15	2.06	3279	591.16	2.01
280	584.86	1280	584.84	−0.01	2280	586.89	2.05	3280	588.97	2.07
281	585.77	1281	585.76	−0.01	2281	587.80	2.04	3281	589.87	2.06
282	586.68	1282	586.68	0.01	2282	588.70	2.02	3282	590.78	2.07
283	587.58	1283	587.58	0.00	2283	589.65	2.07	3283	591.71	2.05
284	588.51	1284	588.52	0.01	2284	590.58	2.06	3284	592.75	2.17
285	589.45	1285	589.46	0.01	2285	591.48	2.02	3285	593.56	2.08
286	590.13	1286	590.14	0.01	2286	592.19	2.05	3286	594.20	2.01
287	589.18	1287	589.18	0.00	2287	591.27	2.08	3287	593.32	2.06
288	588.20	1288	588.21	0.01	2288	590.23	2.02	3288	592.28	2.05
289	587.16	1289	587.14	−0.02	2289	589.19	2.04	3289	591.30	2.11
290	588.44	1290	588.46	0.01	2290	590.48	2.03	3290	592.56	2.08
291	587.55	1291	587.57	0.02	2291	589.61	2.05	3291	591.72	2.11
292	586.63	1292	586.61	−0.02	2292	588.66	2.05	3292	590.77	2.11
293	585.71	1293	585.73	0.02	2293	587.78	2.05	3293	589.81	2.03
294	584.81	1294	584.81	0.00	2294	586.86	2.05	3294	588.93	2.06
295	584.10	1295	584.11	0.01	2295	586.14	2.04	3295	588.28	2.14
296	573.56	1296	573.56	0.00	2296	575.60	2.04	3296	577.64	2.04
297	574.83	1297	574.82	−0.01	2297	576.85	2.03	3297	578.95	2.10
298	577.86	1298	577.87	0.01	2298	579.90	2.02	3298	581.95	2.05
299	576.35	1299	576.35	0.00	2299	578.37	2.02	3299	580.45	2.08
300	579.41	1300	579.43	0.02	2300	581.47	2.04	3300	583.62	2.14
301	580.92	1301	580.91	−0.01	2301	582.94	2.03	3301	585.08	2.14
302	583.92	1302	583.91	−0.01	2302	585.92	2.02	3302	588.04	2.11
303	582.40	1303	582.40	0.00	2303	584.47	2.06	3303	586.52	2.05
304	582.40	1304	582.42	0.02	2304	584.44	2.02	3304	586.50	2.06
305	591.26	1305	591.24	−0.02	2305	593.29	2.05	3305	595.49	2.20
306	590.96	1306	590.97	0.01	2306	593.03	2.07	3306	595.16	2.13
307	591.53	1307	591.54	0.01	2307	593.57	2.03	3307	595.74	2.17
308	583.31	1308	583.32	0.01	2308	585.35	2.02	3308	587.47	2.12
309	584.32	1309	584.32	0.00	2309	586.38	2.05	3309	588.44	2.06
310	585.16	1310	585.16	0.00	2310	587.18	2.02	3310	589.21	2.03
311	583.14	1311	583.16	0.02	2311	585.22	2.06	3311	587.31	2.09
312	582.20	1312	582.20	0.00	2312	584.23	2.03	3312	586.32	2.09
313	584.24	1313	584.23	−0.01	2313	586.27	2.03	3313	588.36	2.09
314	585.30	1314	585.29	−0.01	2314	587.32	2.03	3314	589.40	2.08
315	586.39	1315	586.40	0.01	2315	588.47	2.07	3315	590.50	2.03
316	587.42	1316	587.43	0.01	2316	589.45	2.02	3316	591.49	2.04
317	588.44	1317	588.45	0.01	2317	590.48	2.03	3317	592.52	2.03
318	589.41	1318	589.42	0.01	2318	591.45	2.02	3318	593.50	2.05
319	590.15	1319	590.18	0.03	2319	592.19	2.01	3319	594.28	2.10
320	589.12	1320	589.11	−0.01	2320	591.18	2.07	3320	593.23	2.05
321	588.08	1321	588.08	0.00	2321	590.15	2.07	3321	592.20	2.05
322	587.17	1322	587.17	0.00	2322	589.21	2.05	3322	591.31	2.10
323	586.26	1323	586.26	0.00	2323	588.29	2.03	3323	590.37	2.08
324	585.35	1324	585.36	0.01	2324	587.38	2.02	3324	589.45	2.07
325	584.44	1325	584.44	0.00	2325	586.46	2.02	3325	588.55	2.08
326	583.22	1326	583.22	0.00	2326	585.28	2.06	3326	587.36	2.08
327	581.71	1327	581.71	0.00	2327	583.78	2.07	3327	585.89	2.11
328	580.19	1328	580.20	0.01	2328	582.23	2.03	3328	584.31	2.08
329	578.68	1329	578.69	0.01	2329	580.70	2.01	3329	582.74	2.04
330	577.17	1330	577.19	0.02	2330	579.22	2.03	3330	581.32	2.10
331	575.66	1331	575.67	0.02	2331	577.69	2.02	3331	579.74	2.05
332	574.14	1332	574.14	0.00	2332	576.18	2.04	3332	578.27	2.09
333	572.05	1333	572.04	−0.01	2333	574.11	2.07	3333	576.16	2.05
334	574.00	1334	574.00	0.00	2334	576.06	2.06	Interim	Berm	No Cover
335	582.00	1335	581.98	−0.02	2335	584.03	2.05	Interim	Berm	No Cover
336	574.00	1336	574.01	0.01	2336	576.05	2.04	Interim	Berm	No Cover
337	574.95	1337	574.97	0.02	2337	577.04	2.07	Interim	Berm	No Cover
338	576.47	1338	576.48	0.02	2338	578.52	2.04	Interim	Berm	No Cover
339	577.98	1339	577.99	0.01	2339	580.02	2.03	Interim	Berm	No Cover
340	579.50	1340	579.49	0.00	2340	581.55	2.06	Interim	Berm	No Cover
341	581.01	1341	581.02	0.01	2341	583.11	2.08	Interim	Berm	No Cover
342	582.52	1342	582.53	0.01	2342	584.60	2.07	Interim	Berm	No Cover
343	584.02	1343	584.02	0.00	2343	586.04	2.02	Interim	Berm	No Cover
344	584.93	1344	584.93	0.00	2344	586.99	2.06	Interim	Berm	No Cover
345	585.84	1345	585.85	0.01	2345	587.90	2.05	Interim	Berm	No Cover
346	586.75	1346	586.77	0.02	2346	588.83	2.06	Interim	Berm	No Cover
347	587.66	1347	587.65	−0.01	2347	589.67	2.03	Interim	Berm	No Cover
348	588.72	1348	588.73	0.01	2348	590.82	2.09	Interim	Berm	No Cover

Proposed Subgrade		Verified Subgrade		Proposed-Verified	Verified Top of Clay		Subgrade-Top of Clay	Verified Protective Cover		Clay-Protective Cover
PT#	Elevation	PT#	Elevation	Difference	PT#	Elevation	Difference	PT#	Elevation	Difference
349	589.87	1349	589.88	0.01	2349	591.90	2.02	Interim	Berm	No Cover
350	589.64	1350	589.65	0.01	2350	591.73	2.08	Interim	Berm	No Cover
351	588.67	1351	588.67	0.00	2351	590.74	2.07	Interim	Berm	No Cover
352	587.67	1352	587.68	0.01	2352	589.74	2.06	Interim	Berm	No Cover
353	586.61	1353	586.61	0.00	2353	588.68	2.08	Interim	Berm	No Cover
354	585.56	1354	585.56	0.00	2354	587.64	2.08	Interim	Berm	No Cover
355	584.54	1355	584.55	0.01	2355	586.57	2.02	Interim	Berm	No Cover
356	589.68	1356	589.69	0.01	2356	591.74	2.06	Interim	Berm	No Cover
357	583.89	1357	583.90	0.01	2357	585.93	2.03	Interim	Berm	No Cover
358	583.68	1358	583.68	0.00	2358	585.73	2.06	Interim	Berm	No Cover
359	583.46	1359	583.43	−0.03	2359	585.47	2.04	Interim	Berm	No Cover
360	582.89	1360	582.89	0.00	2360	584.93	2.04	Interim	Berm	No Cover
361	583.25	1361	583.26	0.01	2361	585.30	2.05	Interim	Berm	No Cover
362	583.00	1362	583.01	0.01	2362	585.09	2.08	Interim	Berm	No Cover
363	582.67	1363	582.66	−0.01	2363	584.70	2.03	Interim	Berm	No Cover
364	582.50	1364	582.51	0.01	2364	584.57	2.06	Interim	Berm	No Cover
365	582.27	1365	582.26	−0.01	2365	584.33	2.07	3365	586.49	2.15
366	582.00	1366	582.00	0.00	2366	584.09	2.09	3366	586.17	2.08
367	590.25	1367	590.25	0.00	2367	592.29	2.04	3367	594.37	2.08
368	583.62	1368	583.60	−0.02	2368	585.64	2.03	3368	587.77	2.13
369	591.10	1369	591.12	0.02	2369	593.13	2.02	3369	595.29	2.16
370	590.89	1370	590.89	0.00	2370	592.94	2.05	3370	595.02	2.08
371	590.59	1371	590.58	−0.01	2371	592.63	2.05	3371	594.75	2.11
372	590.46	1372	590.47	0.01	2372	592.51	2.04	3372	594.63	2.12
373	590.29	1373	590.30	0.01	2373	592.35	2.05	3373	594.45	2.10
374	590.07	1374	590.08	0.01	2374	592.16	2.08	Interim	Berm	No Cover
375	590.00	1375	590.00	0.00	2375	592.03	2.03	Interim	Berm	No Cover
376	590.00	1376	590.00	0.00	2376	592.04	2.04	Interim	Berm	No Cover
378	590.29	1378	590.30	0.01	2378	592.33	2.03	3378	594.39	2.06
379	590.59	1379	590.57	−0.02	2379	592.64	2.07	3379	594.85	2.21
380	590.77	1380	590.77	0.00	2380	592.82	2.05	3380	594.87	2.05
381	590.89	1381	590.92	0.03	2381	592.94	2.02	3381	595.15	2.21
382	591.10	1382	591.11	0.01	2382	593.14	2.03	3382	595.32	2.19
383	591.26	1383	591.25	−0.01	2383	593.30	2.04	3383	595.50	2.21
384	591.56	1384	591.54	−0.02	2384	593.55	2.01	3384	595.70	2.15
386	592.00	1386	592.02	0.02	2386	594.09	2.07	3386	596.27	2.18
387	594.00	1387	594.01	0.01	2387	596.04	2.03	3387	598.14	2.10
388	596.00	1388	596.01	0.01	2388	598.04	2.03	3388	600.19	2.15
389	597.93	1389	597.91	−0.02	2389	599.95	2.04	3389	602.14	2.19
390	600.00	1390	600.01	0.01	2390	602.06	2.05	3390	604.20	2.14
391	601.43	1391	601.44	0.01	2391	603.53	2.09	3391	605.68	2.16
392	604.82	1392	604.81	−0.01	2392	606.86	2.05	3392	609.04	2.18
393	608.34	1393	608.33	−0.01	2393	610.37	2.05	3393	612.49	2.12
394	611.86	1394	611.84	−0.02	2394	613.87	2.03	3394	616.03	2.16
395	614.00	1395	613.98	−0.02	2395	616.03	2.05	3395	618.11	2.08
396	614.00	1396	613.99	−0.01	2396	616.02	2.04	3396	618.16	2.13
397	594.00	1397	594.00	0.00	2397	596.03	2.03	3397	598.20	2.17
404	584.00	1404	584.00	0.00	2404	586.04	2.03	Interim	Berm	No Cover
406	584.50	1406	584.50	0.00	2406	586.52	2.02	Interim	Berm	No Cover
407	585.60	1407	585.58	−0.02	2407	587.64	2.06	Interim	Berm	No Cover
409	586.66	1409	586.64	−0.02	2409	588.70	2.06	Interim	Berm	No Cover
410	587.71	1410	587.72	0.01	2410	589.77	2.05	Interim	Berm	No Cover
411	588.71	1411	588.71	0.00	2411	590.76	2.05	Interim	Berm	No Cover
415	583.83	1415	583.85	0.02	2415	585.91	2.06	Interim	Berm	No Cover
416	584.81	1416	584.82	0.01	2416	586.90	2.08	Interim	Berm	No Cover
417	585.71	1417	585.71	0.00	2417	587.77	2.06	Interim	Berm	No Cover
418	586.62	1418	586.64	0.02	2418	588.70	2.07	Interim	Berm	No Cover
419	587.53	1419	587.53	0.00	2419	589.60	2.08	Interim	Berm	No Cover
420	588.00	1420	588.00	0.00	2420	590.06	2.06	Interim	Berm	No Cover
421	588.57	1421	588.58	0.01	2421	590.65	2.07	Interim	Berm	No Cover
422	589.13	1422	589.12	−0.01	2422	591.15	2.03	Interim	Berm	No Cover
423	589.79	1423	589.79	0.00	2423	591.87	2.08	Interim	Berm	No Cover
424	611.86	1424	611.84	−0.02	2424	613.88	2.04	3424	616.07	2.19
425	608.34	1425	608.33	−0.01	2425	610.36	2.03	3425	612.48	2.12
426	604.86	1426	604.87	0.01	2426	606.90	2.03	3426	609.05	2.15
427	601.43	1427	601.44	0.01	2427	603.48	2.04	3427	605.59	2.12
428	597.93	1428	597.91	−0.02	2428	599.94	2.03	3428	602.12	2.18
429	594.48	1429	594.48	0.00	2429	596.56	2.08	3429	598.67	2.11
430	592.04	1430	592.04	0.00	2430	594.07	2.03	3430	596.18	2.11
431	591.91	1431	591.89	−0.02	2431	593.91	2.02	3431	596.06	2.15
432	591.61	1432	591.60	−0.01	2432	593.63	2.03	3432	595.77	2.14
434	590.00	1434	590.02	0.02	2434	592.10	2.08	Interim	Berm	No Cover
435	590.00	1435	590.00	0.00	2435	592.08	2.08	Interim	Berm	No Cover
439	588.00	1439	588.00	0.00	2439	590.08	2.07	3439	592.10	2.03
441	579.46	1441	579.46	0.00	2441	581.50	2.03	3441	583.63	2.13
442	574.20	1442	574.18	−0.02	2442	576.22	2.03	3442	578.30	2.08
443	572.00	1443	571.99	−0.01	2443	574.04	2.04	3443	576.18	2.14
444	572.00	1444	572.00	0.00	2444	574.03	2.03	3444	576.13	2.09
451	588.00	1451	588.00	0.00	2451	590.07	2.06	3451	592.17	2.11
453	594.78	1453	594.78	0.00	2453	596.81	2.03	3453	598.90	2.10
454	585.23	1454	585.24	0.01	2454	587.29	2.06	3454	589.48	2.18
455	584.98	1455	584.98	0.00	2455	587.00	2.03	3455	589.17	2.17
456	589.31	1456	589.31	0.00	2456	591.34	2.03	3456	593.46	2.12
457	590.17	1457	590.16	−0.01	2457	592.20	2.04	3457	594.26	2.06
458	589.82	1458	589.83	0.01	2458	591.87	2.04	3458	594.01	2.15
459	590.00	1459	590.02	0.02	2459	592.06	2.04	3459	594.11	2.05
460	590.28	1460	590.27	−0.01	2460	592.33	2.06	3460	594.39	2.06
462	574.00	1462	574.01	0.01	2462	576.11	2.10	Interim	Berm	No Cover
463	590.00	1463	590.01	0.01	2463	592.08	2.06	3463	594.13	2.06
464	586.00	1464	586.01	0.01	2464	588.03	2.03	3464	590.11	2.08
465	584.00	1465	584.00	0.00	2465	586.03	2.03	3465	588.11	2.08
466	586.10	1466	586.08	−0.02	2466	588.11	2.03	3466	590.18	2.06
468	582.00	1468	582.00	0.00	2468	584.09	2.09	3468	586.29	2.21
470	590.00	1470	590.01	0.01	2470	592.05	2.04	3470	594.13	2.09
471	585.86	1471	585.86	0.00	2471	587.91	2.06	3471	590.05	2.14
601	582.06	1601	582.05	−0.01	2601	584.08	2.03	Interim	Berm	No Cover
607	590.10	1607	590.12	0.02	2607	592.15	2.03	Interim	Berm	No Cover
609	590.46	1609	590.47	0.00	2609	592.49	2.03	3609	594.54	2.05
611	591.91	1611	591.92	0.01	2611	593.98	2.06	3611	596.07	2.09
612	583.15	1612	583.16	0.00	2612	585.18	2.03	Interim	Berm	No Cover
613	591.61	1613	591.59	−0.02	2613	593.64	2.05	3613	595.81	2.16
614	594.48	1614	594.48	0.00	2614	596.52	2.04	3614	598.69	2.17
615	583.37	1615	583.34	−0.03	2615	585.34	2.00	Interim	Berm	No Cover
616	590.25	1616	590.25	0.00	2616	592.33	2.08	Interim	Berm	No Cover
617	590.25	1617	590.27	0.02	2617	592.29	2.02	Interim	Berm	No Cover
618	590.25	1618	590.26	0.01	2618	592.30	2.03	3618	594.50	2.20
619	590.25	1619	590.24	−0.01	2619	592.30	2.06	3619	594.33	2.03
620	590.47	1620	590.49	0.02	2620	592.56	2.07	3620	594.64	2.09
621	591.15	1621	591.17	0.02	2621	593.23	2.06	3621	595.26	2.04
622	591.82	1622	591.83	0.01	2622	593.90	2.06	3622	595.92	2.02
623	592.00	1623	592.00	0.00	2623	594.03	2.03	3623	596.07	2.04
624	592.49	1624	592.50	0.01	2624	594.58	2.08	3624	596.66	2.08
625	593.17	1625	593.18	0.01	2625	595.22	2.04	3625	597.33	2.11
628	594.74	1628	594.75	0.01	2628	596.84	2.09	3628	598.93	2.09
629	595.69	1629	595.68	−0.01	2629	597.73	2.05	3629	599.76	2.03
630	596.00	1630	596.02	0.02	2630	598.08	2.05	3630	600.15	2.07
631	594.00	1631	594.00	0.00	2631	596.03	2.03	3631	598.13	2.10
632	600.00	1632	599.98	−0.02	2632	601.99	2.01	3632	604.14	2.15
633	582.00	1633	582.00	0.00	2633	584.08	2.08	3633	586.18	2.10
634	582.00	1634	582.01	0.01	2634	584.06	2.05	3634	586.21	2.15
635	576.98	1635	576.99	0.01	2635	579.09	2.09	3635	581.13	2.04
636	592.00	1636	591.99	−0.01	2636	594.05	2.06	3636	596.21	2.16
637	590.00	1637	590.02	0.02	2637	592.07	2.06	3637	594.12	2.04
638	594.00	1638	593.99	−0.01	2638	596.02	2.03	3638	598.07	2.05
639	596.00	1639	596.00	0.00	2639	598.03	2.03	3639	600.10	2.07
640	596.00	1640	596.00	0.00	2640	598.06	2.06	3640	600.15	2.09
641	596.00	1641	596.00	0.00	2641	598.05	2.05	3641	600.15	2.09
642	584.00	1642	584.02	0.02	2642	586.04	2.02	3642	588.09	2.05
643	582.25	1643	582.23	−0.02	2643	584.27	2.04	3643	586.46	2.19
644	594.00	1644	594.00	0.00	2644	596.05	2.06	3644	598.15	2.10
645	582.00	1645	582.00	0.00	2645	584.08	2.08	3645	586.16	2.08
646	584.00	1646	584.00	0.00	2646	586.03	2.03	3646	588.13	2.10
647	584.00	1647	584.04	0.04	2647	586.12	2.08	3647	588.21	2.09
659	583.00	1659	583.03	0.03	2659	585.04	2.01	3659	587.09	2.05
660	585.08	1660	585.09	0.01	2660	587.11	2.02	3660	589.15	2.04
661	586.00	1661	586.00	0.00	2661	588.03	2.03	3661	590.06	2.03
662	587.11	1662	587.10	−0.01	2662	589.15	2.04	3662	591.25	2.10
663	588.00	1663	588.00	0.00	2663	590.03	2.03	3663	592.08	2.05
664	588.11	1664	588.12	0.01	2664	590.16	2.04	3664	592.18	2.03
665	589.04	1665	589.05	0.01	2665	591.10	2.04	3665	593.13	2.04
666	589.16	1666	589.15	−0.01	2666	591.15	2.01	3666	593.20	2.05
667	588.53	1667	588.54	0.01	2667	590.60	2.06	3667	592.66	2.06
668	587.58	1668	587.60	0.02	2668	589.66	2.06	3668	591.71	2.04

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Sheet 2

REVISIONS
MCM 2–8–11

Verification Survey of
CMS Landfill V Cell 2–I Construction
Cabarrus County, N.C.

Orig. scale: 1"=50' Date: February 2, 2011 Drawn By: MCM

Job No. 0135–2I Drawing file: Cell 2I Working Surface.dwg Drawing no. 11/009

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Proposed Subgrade		Verified Subgrade		Proposed-Verified	Verified Top of Clay		Subgrade-Top of Clay	Verified Protective Cover		Clay-Protective Cover
PT#	Elevation	PT#	Elevation	Difference	PT#	Elevation	Difference	PT#	Elevation	Difference
669	586.78	1669	586.78	0.00	2669	588.80	2.02	3669	590.85	2.05
670	586.06	1670	586.07	0.01	2670	588.08	2.01	3670	590.13	2.05
671	584.82	1671	584.81	−0.01	2671	586.85	2.04	3671	588.89	2.05
672	584.00	1672	583.99	−0.01	2672	586.00	2.01	3672	588.08	2.08
673	580.00	1673	579.99	−0.01	2673	582.03	2.04	3673	584.10	2.07
674	578.00	1674	577.98	−0.02	2674	580.00	2.02	3674	582.09	2.09
675	576.00	1675	576.00	0.00	2675	578.07	2.07	3675	580.12	2.04
676	574.00	1676	573.99	−0.01	2676	576.01	2.02	3676	578.11	2.10
677	570.00	1677	570.01	0.01	2677	572.11	2.10	Interim	Berm	No Cover
678	570.00	1678	569.99	−0.01	2678	572.11	2.12	Interim	Berm	No Cover
679	570.00	1679	569.99	−0.01	2679	572.02	2.03	Interim	Berm	No Cover
680	570.00	1680	569.97	−0.03	2680	572.01	2.04	Interim	Berm	No Cover
688	580.00	1688	579.97	−0.03	2688	582.04	2.07	Interim	Berm	No Cover
689	580.00	1689	579.98	−0.02	2689	582.02	2.04	Interim	Berm	No Cover
690	580.00	1690	579.96	−0.04	2690	582.04	2.08	Interim	Berm	No Cover
691	580.00	1691	579.97	−0.03	2691	582.01	2.04	Interim	Berm	No Cover
		6003	597.38		7003	599.40	2.02	8003	601.58	2.18
		6004	596.05		7004	598.12	2.07	8004	600.21	2.09
		6005	596.00		7005	598.09	2.09	8005	600.22	2.13
		6006	596.01		7006	598.04	2.03	8006	600.10	2.06
		6007	596.00		7007	598.02	2.02	8007	600.08	2.06
		6008	596.17		7008	598.20	2.03	8008	600.25	2.05
		6009	596.00		7009	598.05	2.05	8009	600.15	2.10
		6010	596.35		7010	598.37	2.02	8010	600.46	2.09
		6011	595.69		7011	597.73	2.04	8011	598.76	2.04
		6012	595.29		7012	597.32	2.03	8012	598.39	2.07
		6013	593.43		7013	595.47	2.04	8013	597.49	2.02
		6014	591.53		7014	593.58	2.05	8014	595.71	2.13
		6015	590.33		7015	592.36	2.03	8015	594.38	2.02
		6016	589.18		7016	591.18	2.00	8016	593.24	2.06
		6017	588.01		7017	590.10	2.09	8017	592.14	2.04
		6018	586.85		7018	588.87	2.02	8018	590.95	2.08
		6019	586.00		7019	588.10	2.10	8019	590.15	2.05
		6020	585.99		7020	588.02	2.03	8020	590.06	2.04
		6021	586.12		7021	588.16	2.04	8021	590.26	2.10
		6022	586.47		7022	588.48	2.00	8022	590.61	2.13
		6023	588.36		7023	590.38	2.02	8023	592.46	2.08
		6024	586.78		7024	588.8	2.02	8024	590.84	2.04
		6025	604.57		7025	606.64	2.07	8025	608.78	2.15
		6026	613.98		7026	616.06	2.08	8026	618.14	2.08
		6027	613.22		7027	615.26	2.03	8027	617.41	2.15
			576.61			578.66	2.05	11201	580.66	2.00
			574.02			576.06	2.04	11206	578.30	2.25
			575.33			577.36	2.04	11207	579.99	2.63
			576.82			578.86	2.04	11212	581.22	2.36
			578.32			580.33	2.01	11213	582.77	2.43
			579.83			581.87	2.04	11218	584.21	2.33
			581.35			583.42	2.07	11219	585.80	2.38
			582.84			584.90	2.06	11224	587.04	2.14
			584.19			586.21	2.02	11225	588.61	2.40
			585.15			587.19	2.04	11230	589.48	2.29
			586.05			588.09	2.03	11231	591.15	3.06
			586.96			589.01	2.05	11236	592.11	3.10
			587.85			589.90	2.05	11237	592.78	2.88
			589.14			591.22	2.08	11242	593.46	2.25
			590.24			592.27	2.03	11243	594.28	2.01
			589.35			591.39	2.04	11248	593.39	2.00
			588.37			590.42	2.05	11249	592.42	2.00
			587.29			589.33	2.05	11254	591.55	2.22
			586.20			588.26	2.06	11255	590.26	2.00
			585.11			587.14	2.03	11260	589.23	2.08
			584.05			586.09	2.04	11261	588.41	2.32
			583.13			585.13	2.00	11266	587.13	2.00
			582.57			584.63	2.06	11267	586.72	2.09
			582.72			584.76	2.04	11272	586.97	2.22
			582.63			584.69	2.05	11273	586.75	2.06
			584.58			586.62	2.04	11280	588.64	2.02

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Sheet 3

Verification Survey of
CMS Landfill V Cell 2-I Construction
Cabarrus County, N.C.

REVISIONS
MCM 2-8-11

Orig. scale: 1"=50' Date: February 2, 2011 Drawn By:MCM

Job No. 0135-21 Drawing file: Cell 21 Working Surface.dwg Drawing no. 11/009

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of NORTH CAROLINA, PLLC

APPENDIX A
Modification

Environmental Consultants
and Contractors

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SCS ENGINEERS, PC

October 1, 2010
File No. 02201314.28

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

Subject: Variance Request for Landfill Bottom Liner System Protective Cover Minimum Permeability Requirements
Charlotte Motor Speedway V MSW Landfill (Permit Number 13-04) – Phase 3, Cell 2I, 2J, 2K and 2M Construction

Dear Mr. Murray:

On behalf of Republic Services, Inc. and the Charlotte Motor Speedway (CMS) Landfill, SCS Engineers, PC (SCS) respectively requests a variance for the minimum permeability required for the native soils protective cover for the Phase 3, Cells 2I, 2J, 2K and 2M landfill bottom liner system. The variance requested is to change the Permit Application for the Phase 3 Permit to Construct minimum laboratory tested permeability for the base liner system protective from $1x10^{-3}$ cm/sec to $1x10^{-4}$ cm/sec. The required minimum testing frequency will be kept at one (1) test per 3,000 cubic yards of placed material. The permeability requirements are outlined in the Construction Quality Assurance (CQA) Plan; Section III, page 32 and Technical Specifications; Section IV; specification section 02253 as part of the Permit Application for the Phase 3 Permit to Construct prepared by Hodges, Harbin, Newberry and Tribble, Inc. (HHNT), dated May 2009.

SCS completed an evaluation of the Phase 3, Cells 2I, 2J, 2K and 2M landfill bottom liner system leachate collection system components with the variance requested $1x10^{-4}$ cm/sec protective cover to verify that they meet the requirements set forth in the Solid Waste Management Rule 15 NCAC 13B .1624.b.2 that less than one (1) foot of head is maintained on top of the landfill HDPE geomembrane liner. The leachate collection system consists of (from top to bottom): 24-inches of native soils protective cover, SKAPS TN330-2-8 double sided drainage geocomposite, and 8-inch diameter perforated pipes surrounded by ASTM No. 57 stone encapsulated by 8 oz/sy non-woven geotextile fabric. Beneath the leachate collection system is Agru America 60 mil microspike HDPE geomembrane.

Three (3) separate hydraulic transmissivity tests (ASTM D 4716) using the leachate collection system $1x10^{-4}$ cm/sec minimum permeability native soils protective cover, double sided drainage geocomposite and 60 mil microspike HDPE geomembrane has been completed. The hydraulic

transmissivity test results performed are included in Attachment A. A summary of the results are in the following Table 1-1.

Table 1-1. Summary of Drainage Geocomposite Conformance Hydraulic Transmissivity Test Results

Sample Id	Laboratory Tested Hydraulic Transmissivity Result (Note 1 & 2)
347510004	1.88×10^{-3} m²/sec
347510110	1.63×10^{-3} m²/sec (Note 3)
347510220	1.80×10^{-3} m²/sec

Notes
1. Laboratory tested (ASTM D 4716) with 2 feet of native soils protective cover, SKAPS Industries double sided drainage geocomposite Transnet 330-2-8, and Agru 60 mil microspike HDPE geomembrane.
2. Tested with a normal load of 10,000 psf and hydraulic gradient of 0.25.
3. The lowest hydraulic transmissivty testing result. Used for HELP model calculations.

To estimate the long-term hydraulic transmissivity for the leachate collection system drainage geocomposite, the lowest hydraulic transmissivity test result was reduced by reduction factors as outlined in Geosynthetic Research Institute (GRI) Standard GC 8. The GRI Standard GC 8 transmissivty reduction description and results is as follows:

$$T_{FACTORED} = \frac{T_{LABORATORY}}{RF_{IN} * RF_{CC} * RF_{BC} * RF_{CR} * FS}$$

Reduction Factors

RF_{IN} - Intrusion = 1.0
RF_{CC} - Chemical Clogging = 1.75
RF_{BC} - Biological Clogging = 1.20
RF_{CR} - Creep = 1.70
FS - Factor of Safety = 2.0

$$T_{FACTORED} = \frac{1.63 \times 10^{-3}\ m^2/sec}{1.0 * 1.75 * 1.20 * 1.70 * 2.0}$$

$$T_{FACTORED} = 2.28 \times 10^{-4}\ m^2/sec = 2.72\ cm/sec$$

To demonstrate that the leachate collection system $1x10^{-4}$ cm/sec minimum permeability native soils protective cover and 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 results show that the leachate collection system drainage geocomposite factored hydraulic transmissivity of $2.28x10^{-4}$ m^2/sec and the $1x10^{-4}$ cm/sec minimum permeability native soils protective cover will provide the necessary transmissivity and permeability to maintain less than one (1) foot of head on top of the landfill bottom liner system HDPE geomembrane. The HELP model results are included in Attachment B. A summary of the HELP model results are in the following Table 1-2:

Table 1-2. Summary of HELP Model Results for Typical One Acre Cell (Protective Cover with a Minimum Permeability of $1x10^{-4}$ cm/sec and Drainage Geocomposite with a Factored Hydraulic Transmissivity of $2.28x10^{-4}$ m^2/sec)

Evaluation Parameters	Drainage Geocomposite Tested Hydraulic Transmissivity Result with Reduction Factors (Note 1)	Native Soils Protective Cover Minimum Permeability	Average Annual Head on Geomembrane	Peak Daily Average Head on Geomembrane	Peak Daily Maximum Head on Geomembrane
15 feet of Waste with Daily Cover	$2.28x10^{-4}$ m^2/sec (2.72 cm/sec)[Note 1]	$1x10^{-4}$ cm/sec	0.038 inches	7.437 inches	11.284 inches
70 feet of Waste with Daily Cover	$2.28x10^{-4}$ m^2/sec (2.72 cm/sec)[Note 1]	$1x10^{-4}$ cm/sec	0.031 inches	0.146 inches	0.287 inches
130 feet of Waste with Intermediate Cover	$2.28x10^{-4}$ m^2/sec (2.72 cm/sec)[Note 1]	$1x10^{-4}$ cm/sec	0.044 inches	0.156 inches	0.305 inches

Notes
1. Based on a factored hydraulic transmissivity of $2.28x10^{-4}$ m^2/sec and material thickness of 0.8382 cm.

As shown in Table 1-2, the HELP model results using the drainage geocomposite factored lowest hydraulic transmissivity laboratory testing result and variance requested minimum permeability $1x10^{-4}$ cm/sec native soils protective cover 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.

We trust that the information provided for this variance request meets the requirements of the State Solid Waste Management Rules. If you have any questions or need additional information please don't hesitate to contact me at (704) 504 – 3107 or Mike Gurley at (704) 782-2004 ext 391.

Sincerely,

Albert D. Glenn, P.E.
Project Manager
SCS ENGINEERS, PC

NORTH CAROLINA PROFESSIONAL SEAL 031802 10/1/2010 ENGINEER ALBERT D. GLENN

Attachments

Cc: Mike Gurley - CMS Landfill, Richard Deason - Atlantic Coast Consulting, Inc., and File

M:\PROJECT FILES\02201314.28 - CMS Landfill Permit Modification\Correspondence\CMSLF Phase 3 Leachate Collection System Variance Request.doc

ATTACHMENT A

Hydraulic Transmissivity Test Results

TRI / Environmental, Inc.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

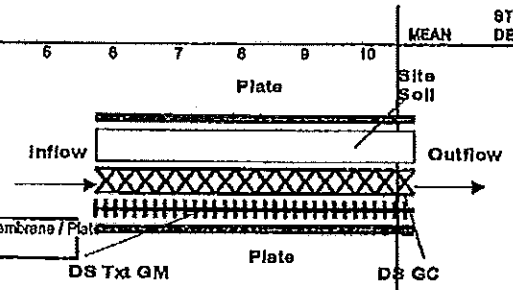
Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510004
TRI Log #: E2334-98-06

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



Seat Time (hours)		Specimen	1					
	Volume (cc)		713	710	724			
	Time (s)		5.09	5.10	5.14			
24	Flow Rate (GPM/ft width)		2.22	2.21	2.23	2.22	0.01	
	Transmissivity (m^2/s)		1.88E-03	1.87E-03	1.89E-03	1.88E-03	1.10E-05	5.0E-4 min
	Test Temp (C)			19.0				
	Temp. Corr. Factor			1.025				

Peel Strength (ASTM F 904, mod.)

A - MD Average Peel Strength (ppi)	1.9	1.7	2.5	1.3	3.9	2.3	1.0	
A - MD Average Peel Strength (g/in)	863	772	1135	590	1771	1026	460	150 min
B - MD Average Peel Strength (ppi)	2.7	1.8	3.7	2.3	6.9	3.6	2.0	
B - MD Average Peel Strength (g/in)	1228	817	1680	1044	3133	1680	924	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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GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax 512 263 2558

GEOCOMPOSITE TEST RESULTS

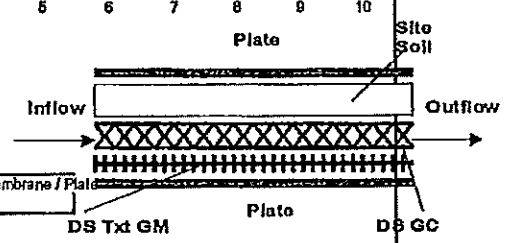
TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347610110
TRI Log #: E2334-98-08

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



Seat Time (hours)	Specimen	1											
	Volume (cc)	607	599	614									
	Time (s)	6.10	6.01	6.13									
24	Flow Rate (GPM/ft width)	1.89	1.90	1.90							1.89	0.01	
	Transmissivity (m^2/s)	1.62E-03	1.63E-03	1.63E-03							1.63E-03	4.84E-06	5.0E-4 m/s
	Test Temp (C)		18.5										
	Temp. Corr. Factor		1.038										

Peel Strength (ASTM F 904, mod.)													
A - MD Average Peel Strength (ppi)	2.3	2.2	2.7	4.2	2.9						2.9	0.8	
A - MD Average Peel Strength (g/in)	1044	999	1226	1907	1317						1298	364	150 min
B - MD Average Peel Strength (ppi)	4.0	2.1	4.2	2.9	4.2						3.5	0.9	
B - MD Average Peel Strength (g/in)	1816	953	1907	1317	1907						1580	428	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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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

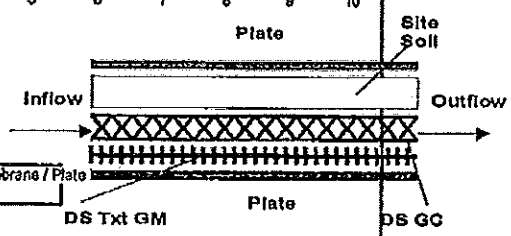
Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510220
TRI Log #: E2334-99-06

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



Test Time (hours)		Specimen	1			MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)		686	678	674			
	Time (s)		5.10	5.06	5.04			
24	Flow Rate (GPM/ft width)		2.13	2.12	2.12	2.13	0.01	
	Transmissivity (m^2/s)		1.81E-03	1.80E-03	1.80E-03	1.80E-03	5.34E-06	5.0E-4 min
	Test Temp (C)			19.0				
	Temp. Corr. Factor			1.025				

Peel Strength (ASTM F 904, mod.)

	1	2	3	4	5	MEAN	STD. DEV.	PROJ. SPEC.
A - MD Average Peel Strength (ppi)	2.2	1.7	3.9	2.5	1.8	2.4	0.9	
A - MD Average Peel Strength (g/in)	999	772	1771	1135	817	1099	403	150 min
B - MD Average Peel Strength (ppi)	4.6	1.0	7.7	1.8	1.0	3.2	2.9	
B - MD Average Peel Strength (g/in)	2088	454	3496	817	454	1462	1321	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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ATTACHMENT B

HELP Model Results

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0
******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              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\15FT\DATA10.D10
OUTPUT DATA FILE:            C:\CMSLF\15FT\INITIAL.OUT


TIME:  10:56     DATE:  10/ 1/2010


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

     TITLE:  CMS LANDFILL V PHASE 3 - 15 FEET OF WASTE

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


     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   7
        THICKNESS                    =      6.00   INCHES
        POROSITY                     =      0.4730 VOL/VOL
        FIELD CAPACITY               =      0.2220 VOL/VOL
        WILTING POINT                =      0.1040 VOL/VOL
        INITIAL SOIL WATER CONTENT   =      0.1532 VOL/VOL
        EFFECTIVE SAT. HYD. COND.    =  0.520000001000E-03 CM/SEC


                                LAYER  2
                                --------

              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   =      0.3220 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                     =      0.3980 VOL/VOL
FIELD CAPACITY               =      0.2440 VOL/VOL
WILTING POINT                =      0.1360 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.2922 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =  0.999999975000E-04 CM/SEC
```

1×10^{-4} cm/sec

```
                         LAYER  4
                         --------

            TYPE 2 - LATERAL DRAINAGE LAYER
              MATERIAL TEXTURE NUMBER   0
THICKNESS                    =      0.33   INCHES
POROSITY                     =      0.8500 VOL/VOL
FIELD CAPACITY               =      0.0100 VOL/VOL
WILTING POINT                =      0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.0263 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   2.72000003000     CM/SEC
SLOPE                        =      2.00   PERCENT
DRAINAGE LENGTH              =    300.0    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
FML INSTALLATION DEFECTS     =      3.00   HOLES/ACRE
FML PLACEMENT QUALITY        =  3 - GOOD
```

```
                         LAYER  6
                         --------

              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                    =     24.00   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.    =  0.100000001000E-06 CM/SEC
```

1×10^{-7} cm/sec

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 7 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 300. FEET.

SCS RUNOFF CURVE NUMBER	=	88.20	
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	=	1.915	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.522	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.932	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	37.508	INCHES
TOTAL INITIAL WATER	=	37.508	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	%
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	31.253	113447.562	79.38
DRAINAGE COLLECTED FROM LAYER 4	8.1127	29449.238	20.61
PERC./LEAKAGE THROUGH LAYER 6	0.000036	0.130	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0216		
CHANGE IN WATER STORAGE	0.004	16.215	0.01
SOIL WATER AT START OF YEAR	37.508	136155.219	
SOIL WATER AT END OF YEAR	37.513	136171.437	
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	-0.005	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	31.352	113806.711	68.20
DRAINAGE COLLECTED FROM LAYER 4	18.1254	65795.289	39.43
PERC./LEAKAGE THROUGH LAYER 6	0.000073	0.266	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0487		
CHANGE IN WATER STORAGE	-3.507	-12731.144	-7.63
SOIL WATER AT START OF YEAR	37.513	136171.437	
SOIL WATER AT END OF YEAR	34.006	123440.289	
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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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	48.06	174457.781	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	34.071	123677.273	70.89
DRAINAGE COLLECTED FROM LAYER 4	13.1096	47587.926	27.28
PERC./LEAKAGE THROUGH LAYER 6	0.000088	0.318	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0730		
CHANGE IN WATER STORAGE	0.879	3192.309	1.83
SOIL WATER AT START OF YEAR	34.006	123440.289	
SOIL WATER AT END OF YEAR	34.636	125727.242	
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	-0.044	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	29.719	107880.891	80.67
DRAINAGE COLLECTED FROM LAYER 4	5.9478	21590.621	16.15
PERC./LEAKAGE THROUGH LAYER 6	0.000028	0.102	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0157		
CHANGE IN WATER STORAGE	1.173	4257.594	3.18
SOIL WATER AT START OF YEAR	34.636	125727.242	
SOIL WATER AT END OF YEAR	36.058	130890.187	
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	-0.008	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	31.762	115295.172	69.41
DRAINAGE COLLECTED FROM LAYER 4	12.4553	45212.863	27.22
PERC./LEAKAGE THROUGH LAYER 6	0.000053	0.194	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0332		
CHANGE IN WATER STORAGE	1.543	5600.603	3.37
SOIL WATER AT START OF YEAR	36.058	130890.187	
SOIL WATER AT END OF YEAR	37.601	136490.797	
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	-0.021	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	0.000	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	1.691	2.158	3.241	3.202	3.473	3.046
	4.222	2.755	2.693	2.096	1.717	1.337
STD. DEVIATIONS	0.169	0.276	0.210	1.023	1.799	1.022
	1.800	1.656	1.525	1.076	0.651	0.119

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	1.5207	1.5543	1.4910	1.3978	0.7404	0.7220
	0.5786	0.4107	0.7797	0.8517	0.9874	0.5158
STD. DEVIATIONS	1.5713	1.7369	1.1433	0.6712	0.8707	1.2362
	0.5613	0.4055	0.9138	0.7323	0.6381	0.2502

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 5

AVERAGES	0.0477	0.1435	0.0468	0.0453	0.0232	0.0234
	0.0182	0.0129	0.0253	0.0267	0.0320	0.0162
STD. DEVIATIONS	0.0493	0.2539	0.0359	0.0218	0.0273	0.0401
	0.0176	0.0127	0.0296	0.0230	0.0207	0.0079

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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	31.631	(1.5690)	114821.52	73.221
LATERAL DRAINAGE COLLECTED FROM LAYER 4	11.55019	(4.73517)	41927.187	26.73655
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00006	(0.00002)	0.202	0.00013
AVERAGE HEAD ON TOP OF LAYER 5	0.038	(0.023)		
CHANGE IN WATER STORAGE	0.018	(2.0511)	67.12	0.043

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	2.43	8820.900

RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.33938	1231.94141
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000020	0.07369
AVERAGE HEAD ON TOP OF LAYER 5	7.437	
MAXIMUM HEAD ON TOP OF LAYER 5	11.284	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	72.3 FEET	
SNOW WATER	2.24	8132.3433

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3967
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0932

*** 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	1.5183	0.2530
2	19.0046	0.3167
3	6.7942	0.2831
4	0.0356	0.1080
5	0.0000	0.0000
6	10.2480	0.4270
SNOW WATER	0.000	

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0
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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              **
**                                                                          **
**                                                                          **
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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\70ft\DATA10.D10
OUTPUT DATA FILE:            C:\CMSLF\70FT\70FT.OUT


TIME:  10:58     DATE:  10/ 1/2010


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     TITLE:  CMS LANDFILL V PHASE 3 - 70 FEET OF WASTE

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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   7
          THICKNESS                  =      6.00   INCHES
          POROSITY                   =      0.4730 VOL/VOL
          FIELD CAPACITY             =      0.2220 VOL/VOL
          WILTING POINT              =      0.1040 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.1532 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.520000001000E-03 CM/SEC


                                  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 =      0.2951 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.100000005000E-02 CM/SEC
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                         LAYER  3
                         --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER   0
THICKNESS                    =     24.00   INCHES
POROSITY                     =      0.3980 VOL/VOL
FIELD CAPACITY               =      0.2440 VOL/VOL
WILTING POINT                =      0.1360 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.2617 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =  0.999999975000E-04 CM/SEC  1 x 10^-4 cm/sec


                         LAYER  4
                         --------

            TYPE 2 - LATERAL DRAINAGE LAYER
              MATERIAL TEXTURE NUMBER   0
THICKNESS                    =      0.33   INCHES
POROSITY                     =      0.8500 VOL/VOL
FIELD CAPACITY               =      0.0100 VOL/VOL
WILTING POINT                =      0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.0302 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   2.72000003000     CM/SEC
SLOPE                        =      2.00   PERCENT
DRAINAGE LENGTH              =    300.0    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
FML INSTALLATION DEFECTS     =      3.00   HOLES/ACRE
FML PLACEMENT QUALITY        =  3 - GOOD


                         LAYER  6
                         --------

              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                    =     24.00   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.    =  0.100000001000E-06 CM/SEC  1 x 10^-7 cm/sec
```

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 7 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 30. FEET.

SCS RUNOFF CURVE NUMBER	=	89.50	
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	=	1.915	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.522	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.932	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	265.345	INCHES
TOTAL INITIAL WATER	=	265.345	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	%
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	0.000	0.000	0.00
EVAPOTRANSPIRATION	31.253	113447.562	79.38
DRAINAGE COLLECTED FROM LAYER 4	8.1128	29449.545	20.61
PERC./LEAKAGE THROUGH LAYER 6	0.000036	0.132	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0219		
CHANGE IN WATER STORAGE	0.004	15.841	0.01
SOIL WATER AT START OF YEAR	265.345	963202.437	
SOIL WATER AT END OF YEAR	265.349	963218.312	
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	0.059	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	31.352	113806.711	68.20
DRAINAGE COLLECTED FROM LAYER 4	17.8375	64750.215	38.80
PERC./LEAKAGE THROUGH LAYER 6	0.000074	0.267	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0478		
CHANGE IN WATER STORAGE	-3.219	-11685.945	-7.00
SOIL WATER AT START OF YEAR	265.349	963218.312	
SOIL WATER AT END OF YEAR	262.130	951532.375	
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	-0.101	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	48.06	174457.781	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	34.071	123677.273	70.89
DRAINAGE COLLECTED FROM LAYER 4	13.4278	48743.094	27.94
PERC./LEAKAGE THROUGH LAYER 6	0.000057	0.207	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0357		
CHANGE IN WATER STORAGE	0.561	2037.176	1.17
SOIL WATER AT START OF YEAR	262.130	951532.375	
SOIL WATER AT END OF YEAR	262.442	952664.187	
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	0.029	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	29.719	107880.891	80.67
DRAINAGE COLLECTED FROM LAYER 4	5.9689	21666.936	16.20
PERC./LEAKAGE THROUGH LAYER 6	0.000028	0.102	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0158		
CHANGE IN WATER STORAGE	1.152	4181.392	3.13
SOIL WATER AT START OF YEAR	262.442	952664.187	
SOIL WATER AT END OF YEAR	263.843	957750.937	
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	-0.119	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	31.762	115295.172	69.41
DRAINAGE COLLECTED FROM LAYER 4	12.3569	44855.664	27.00
PERC./LEAKAGE THROUGH LAYER 6	0.000053	0.194	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0328		
CHANGE IN WATER STORAGE	1.641	5957.685	3.59
SOIL WATER AT START OF YEAR	263.843	957750.937	
SOIL WATER AT END OF YEAR	265.484	963708.625	
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	0.094	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	0.000	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	1.691	2.158	3.241	3.202	3.473	3.046
	4.222	2.755	2.693	2.096	1.717	1.337
STD. DEVIATIONS	0.169	0.276	0.210	1.023	1.799	1.022
	1.800	1.656	1.525	1.076	0.651	0.119

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	0.7794	0.8731	1.2092	2.0089	1.4044	0.9268
	0.7782	0.4709	0.5527	0.7004	0.8778	0.9591
STD. DEVIATIONS	0.5151	0.8301	0.8679	0.8830	0.7018	0.9076
	0.8489	0.4264	0.6524	0.6777	0.7613	0.6638

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 5

AVERAGES	0.0245	0.0303	0.0380	0.0652	0.0441	0.0301
	0.0244	0.0148	0.0179	0.0220	0.0285	0.0301
STD. DEVIATIONS	0.0162	0.0289	0.0272	0.0286	0.0220	0.0294
	0.0266	0.0134	0.0212	0.0213	0.0247	0.0208

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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	31.631	(1.5690)	114821.52	73.221
LATERAL DRAINAGE COLLECTED FROM LAYER 4	11.54080	(4.65493)	41893.090	26.71480
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00005	(0.00002)	0.180	0.00011
AVERAGE HEAD ON TOP OF LAYER 5	0.031	(0.012)		
CHANGE IN WATER STORAGE	0.028	(1.9167)	101.23	0.065

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	2.43	8820.900

RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.15016	545.06360
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000001	0.00207
AVERAGE HEAD ON TOP OF LAYER 5	0.146	
MAXIMUM HEAD ON TOP OF LAYER 5	0.287	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	5.3 FEET	
SNOW WATER	2.24	8132.3433

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3967
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0932

*** 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	1.5183	0.2530
2	246.7646	0.2938
3	6.9066	0.2878
4	0.0470	0.1424
5	0.0000	0.0000
6	10.2480	0.4270
SNOW WATER	0.000	

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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              **
**                                                                          **
**                                                                          **
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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\130FT\DATA10.D10
OUTPUT DATA FILE:            C:\CMSLF\130FT\130FT.OUT


TIME:  11: 0     DATE:  10/ 1/2010


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     TITLE:  CMS LANDFILL V PHASE 3 - 130 FEET OF WASTE

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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   7
        THICKNESS                    =     12.00   INCHES
        POROSITY                     =      0.4730 VOL/VOL
        FIELD CAPACITY               =      0.2220 VOL/VOL
        WILTING POINT                =      0.1040 VOL/VOL
        INITIAL SOIL WATER CONTENT   =      0.2078 VOL/VOL
        EFFECTIVE SAT. HYD. COND.    =  0.520000001000E-03 CM/SEC


                                 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   =      0.2937 VOL/VOL
        EFFECTIVE SAT. HYD. COND.    =  0.100000005000E-02 CM/SEC
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                    LAYER  3
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          TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER   0
THICKNESS                    =     24.00   INCHES
POROSITY                     =      0.3980 VOL/VOL
FIELD CAPACITY               =      0.2440 VOL/VOL
WILTING POINT                =      0.1360 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.2674 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =  0.999999975000E-04 CM/SEC
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1×10^{-4} cm/sec

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                    LAYER  4
                    --------

            TYPE 2 - LATERAL DRAINAGE LAYER
              MATERIAL TEXTURE NUMBER   0
THICKNESS                    =      0.33   INCHES
POROSITY                     =      0.7500 VOL/VOL
FIELD CAPACITY               =      0.7470 VOL/VOL
WILTING POINT                =      0.4000 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.7471 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   2.72000003000     CM/SEC
SLOPE                        =      2.00   PERCENT
DRAINAGE LENGTH              =    300.0    FEET
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                    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
FML INSTALLATION DEFECTS     =      3.00   HOLES/ACRE
FML PLACEMENT QUALITY        =  3 - GOOD
```

```
                    LAYER  6
                    --------

              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                    =     24.00   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.    =  0.100000001000E-06 CM/SEC
```

1×10^{-7} cm/sec

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 7 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 30. FEET.

SCS RUNOFF CURVE NUMBER	=	89.50	
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	=	1.953	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4.730	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.040	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	477.577	INCHES
TOTAL INITIAL WATER	=	477.577	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	%
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	0.000	0.000	0.00
EVAPOTRANSPIRATION	24.427	88668.859	62.04
DRAINAGE COLLECTED FROM LAYER 4	14.8387	53864.594	37.69
PERC./LEAKAGE THROUGH LAYER 6	0.000063	0.228	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0399		
CHANGE IN WATER STORAGE	0.105	379.417	0.27
SOIL WATER AT START OF YEAR	477.577	1733604.000	
SOIL WATER AT END OF YEAR	477.681	1733983.370	
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	0.039	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	28.297	102718.000	61.56
DRAINAGE COLLECTED FROM LAYER 4	20.3311	73802.070	44.23
PERC./LEAKAGE THROUGH LAYER 6	0.000083	0.302	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0542		
CHANGE IN WATER STORAGE	-2.658	-9649.277	-5.78
SOIL WATER AT START OF YEAR	477.681	1733983.370	
SOIL WATER AT END OF YEAR	475.023	1724334.120	
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	0.051	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	48.06	174457.781	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	31.699	115065.648	65.96
DRAINAGE COLLECTED FROM LAYER 4	16.7755	60894.910	34.91
PERC./LEAKAGE THROUGH LAYER 6	0.000070	0.255	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0446		
CHANGE IN WATER STORAGE	-0.414	-1502.871	-0.86
SOIL WATER AT START OF YEAR	475.023	1724334.120	
SOIL WATER AT END OF YEAR	474.360	1721925.870	
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	-0.167	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	21.674	78674.914	58.83
DRAINAGE COLLECTED FROM LAYER 4	14.1719	51444.145	38.47
PERC./LEAKAGE THROUGH LAYER 6	0.000060	0.219	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0377		
CHANGE IN WATER STORAGE	0.994	3609.773	2.70
SOIL WATER AT START OF YEAR	474.360	1721925.870	
SOIL WATER AT END OF YEAR	475.604	1726441.000	
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	0.147	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	27.795	100894.703	60.74
DRAINAGE COLLECTED FROM LAYER 4	16.0629	58308.227	35.10
PERC./LEAKAGE THROUGH LAYER 6	0.000067	0.244	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0427		
CHANGE IN WATER STORAGE	1.902	6905.619	4.16
SOIL WATER AT START OF YEAR	475.604	1726441.000	
SOIL WATER AT END OF YEAR	477.506	1733346.620	
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	0.019	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	0.000	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	1.463	1.887	3.089	2.589	2.599	2.551
	3.705	2.104	2.415	1.836	1.265	1.277
STD. DEVIATIONS	0.219	0.545	0.344	1.366	1.805	0.897
	2.218	1.934	1.449	1.245	1.042	0.181

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	0.9117	1.0078	1.2961	1.8163	1.8565	1.6659
	1.4033	1.6190	1.1491	1.2197	1.1185	1.3720
STD. DEVIATIONS	0.3913	0.6610	0.5382	0.6153	0.9003	0.6307
	0.7270	0.7347	0.2229	0.8022	0.4227	0.9022

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 5

AVERAGES	0.0286	0.0350	0.0408	0.0589	0.0583	0.0541
	0.0441	0.0509	0.0373	0.0383	0.0363	0.0431
STD. DEVIATIONS	0.0123	0.0231	0.0168	0.0200	0.0283	0.0205
	0.0228	0.0230	0.0073	0.0251	0.0137	0.0283

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	26.778	(3.8450)	97204.43	61.986
LATERAL DRAINAGE COLLECTED FROM LAYER 4	16.43603	(2.40332)	59662.793	38.04636
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00007	(0.00001)	0.250	0.00016
AVERAGE HEAD ON TOP OF LAYER 5	0.044	(0.006)		
CHANGE IN WATER STORAGE	-0.014	(1.7216)	-51.47	-0.033

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	2.43	8820.900

RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.16001	580.85175
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000001	0.00218
AVERAGE HEAD ON TOP OF LAYER 5	0.156	
MAXIMUM HEAD ON TOP OF LAYER 5	0.305	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	5.7 FEET	
SNOW WATER	2.24	8132.3433

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3835
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1040

*** 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	3.3555	0.2796
2	456.5770	0.2927
3	7.0788	0.2950
4	0.2467	0.7474
5	0.0000	0.0000
6	10.2480	0.4270
SNOW WATER	0.000	

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Environmental Consultants
and Contractors

SCS Engineers, P.C.
2520 Whitehall Park Drive
Suite 450
Charlotte, NC 28273-3557

704 504-3107
FAX 704 504-3174
www.scsengineers.com

SCS ENGINEERS, PC

November 5, 2010
File No. 02201314.28

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

Subject: Response to Comments – Plan for the Leachate Collection System Cleaning, Inspection and Record Keeping
Variance Request for the Landfill Bottom Liner System Protective Cover Minimum Permeability Requirements for Phase 3, Cell 2I, 2J, 2K and 2M Construction
Charlotte Motor Speedway (CMS) V MSW Landfill (Permit Number 13-04)

Dear Mr. Murray:

A Variance Request dated October 1, 2010 was submitted to you for the minimum permeability required for the native soils protective cover for the Phase 3, Cells 2I, 2J, 2K and 2M landfill bottom liner system. The variance requested was to change the Permit Application for the Phase 3 Permit to Construct minimum laboratory tested permeability for the bottom liner system protective from $1x10^{-3}$ cm/sec to $1x10^{-4}$ cm/sec while maintaining the required minimum testing frequency at one (1) test per 3,000 cubic yards of placed material. The permeability requirements are outlined in the Construction Quality Assurance (CQA) Plan; Section III, page 32 and Technical Specifications; Section IV; specification section 02253 as part of the Permit Application for the Phase 3 Permit to Construct prepared by Hodges, Harbin, Newberry and Tribble, Inc. (HHNT), dated May 2009.

As part of the Variance Request supporting calculations and documentation was prepared to demonstrate that the Phase 3, Cells 2I, 2J, 2K and 2M landfill bottom liner system leachate collection system components with the variance requested $1x10^{-4}$ cm/sec protective cover meets the requirements set forth in the Solid Waste Management Rule 15 NCAC 13B .1624.b.2 that less than one (1) foot of head is maintained on top of the landfill HDPE geomembrane liner.

In response to the Variance Request, you responded verbally that a written plan be prepared and implemented by the landfill for the cleaning, inspection and record keeping of the bottom liner system leachate collection system for approval of the variance request. A plan was prepared and submitted to you on October 26, 2010 for regulatory review and subsequently we received comments back from you on changes to the prepared plan. Your changes have been incorporated into the "Plan for the Leachate Collection System Cleaning, Inspection and Record Keeping" and is included as an attachment to this letter. As outlined in previous correspondence to you dated

October 26, 2010, the "Plan for the Leachate Collection System Cleaning, Inspection and Record Keeping" will be included as Appendix 6 of the Landfill Operations Plan.

We trust that the additional information provided for the variance request is responsive for approval. If you have any questions or need additional information please don't hesitate to contact me at (704) 504 – 3107 or Mike Gurley at (704) 782-2004 ext 391.

Sincerely,

Albert D. Glenn, P.E.
Project Manager
SCS ENGINEERS, PC

Attachments: Operations Plan; Appendix 6 – Plan for the Leachate Collection System Cleaning, Inspection and Record Keeping.

Cc: Mike Gurley - CMS Landfill, Ed Mussler - Solid Waste Section - Permitting Branch and File

M:\PROJECT FILES\02201314.28 - CMS Landfill Permit Modification\Protective Cover Variance Request\Protective Cover Variance Request - Response to Comments_11-05-2010.doc

APPENDIX 6

OPERATIONS PLAN FOR CMS LANDFILL V PHASE 3

PLAN FOR THE LEACHATE COLLECTION SYSTEM CLEANING, INSPECTION AND RECORD KEEPING

Inspection Schedule for the Leachate Collection System

Frequency	Description
Weekly	Operating condition of leachate collection and removal system (pump control panels, flow meters, valves, pumps, risers, cleanouts, manholes, etc.).
Annually	Inspection and maintenance of leachate pumps and pump control system equipment.
Every two years	Leachate collection piping cleaned with high pressure water jetting. A variance from further jet cleaning can be requested after 5-years from the Division of Waste Management – Solid Waste Section unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.
Every five years	Leachate collection piping closed-circuit televised (CCTV) inspection. The piping shall be high pressure water jet cleaned if obstructions are observed during the CCTV inspection. After the 5-year leachate collection piping CCTV inspection, a variance from further CCTV inspection and cleaning can be requested from the Division of Waste Management – Solid Waste Section unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.
Following a new landfill cell construction. Part of issuance of a Permit to Operate.	Leachate collection piping closed-circuit televised (CCTV) inspection. The piping shall be high pressure water jet cleaned if obstructions are observed during the CCTV inspection. Documentation of the CCTV inspection should be included as part of the construction quality assurance (CQA) documentation submitted to the Division of Waste Management – Solid Waste Section for the Permit to Operate.

Leachate Collection System Inspection Plan

The landfill bottom liner system leachate collection system (LCS) is placed over the landfill's bottom liner system geomembrane utilizing a drainage geocomposite, 24 inches of a native soils protective cover layer, collection pipes and side-slope riser pipes with submersible pumps. The LCS external to the landfill consists of pump control panels, force main pipes, valves, manholes, cleanouts and a storage lagoon. Care must be taken when inspecting all leachate facilities. There is the potential for the build-up of methane gas in structures and pipes, and there is a potential for dermal contact with leachate. Guidelines for inspection and maintenance of the leachate collection system are as follows:

Leachate Collection and Pumping System Inspection Program (includes pump control panels, flow meters, valves, pumps, risers, cleanouts, manholes, etc.)

The landfill shall institute an inspection and maintenance program for the leachate collection and pumping system. The program shall contain at a minimum the following:

1. Yearly inspection and maintenance of the pumps and pump control system equipment by an outside company familiar with the equipment or similar type of equipment. A report shall be generated from the yearly inspection and maintenance and kept in the landfill operating record.

2. Continuously monitor the high water and pump failure alarms on each of the pump control panels.
3. On a weekly basis monitor and record the general operating condition of the leachate collection pumps, pump control panels, leachate level transducers, and flow meters. In addition, when applicable on a weekly basis from each landfill cell, monitor and record leachate flow, leachate level on the bottom liner system, and pump run time. The weekly monitoring information shall be recorded in a log kept in the landfill operating record.
4. At variable intervals, review the weekly monitoring information for early warnings and to determine if the leachate collection and pumping system is working properly. (Monitoring early warning examples: if a pump has excessive run times with little or no reduction in leachate levels then the leachate collection sump may be clogged; if a pump has low run times with consistent high leachate levels on the bottom liner system then the pump is not working correctly or the leachate collection sump or piping is clogged; if the pump is constantly operating and the flow meter shows little or no flow then the pump discharge pipe check valve may not be working correctly or a valve may be closed or partially closed).

Leachate Collection Piping Inspection Program

1. Leachate collection piping located in newly constructed landfill cells will be closed-circuit televised (CCTV) following completion of construction and documentation as to the CCTV inspection included as part of the construction quality assurance (CQA) documentation for issuance of the Permit to Operate from the NCDENR Division of Waste Management. In addition, if during the leachate piping CCTV inspection a blockage is observed, the piping with the blockage at a minimum will be cleaned with high pressure water jetting and CCTV to verify that the blockage is removed.
2. Leachate collection piping will be cleaned with high pressure water jetting 2-years after the most recent jet cleaning. A variance from further jet cleaning can be requested after 5-years from the Division of Waste Management – Solid Waste Section unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.
3. After the initial closed-circuit televised (CCTV) inspection for the new landfill cell construction, the leachate collection piping will be CCTV 5-years after the most recent CCTV inspection. In addition, if during the leachate piping CCTV inspection a blockage is observed the piping with the blockage at a minimum will be cleaned with high pressure water jetting and CCTV to verify that the blockage is removed. After the 5-year leachate collection piping CCTV inspection and cleaning, a variance from further CCTV inspection and cleaning can be requested from the Division unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.

Leachate Collection and Pumping System Contingency Plan

The landfill shall institute an contingency plan that if a determination is made from the monitoring of the leachate collection and pumping system that the collection piping or sump may have a blockage, the sump and/or collection piping for the landfill cell will be cleaned with high pressure water jetting and closed-circuit televised (CCTV). In addition, leachate pump removal and visual inspection will be completed during the yearly inspection and maintenance of the equipment and if deemed necessary a pump drawdown test will be completed.

The leachate pumping system is determined to be working correctly when the pump flow rate and reduction in leachate level is consistent with the manufacture pump design flow rate and design level reduction.

Monitoring and Recordkeeping for the Leachate Collection System

The landfill will maintain records about the leachate collection system inspection and maintenance for the following items:

1. Continuously monitor the high water and pump failure alarms on each of the pump control panels.
2. On a weekly basis monitor and record the general operating condition of the leachate collection pumps, pump control panels, leachate level transducers, and flow meters. In addition, when applicable on a weekly basis from each landfill cell, monitor and record leachate flow, leachate level on the base liner system, and pump run time. The weekly monitoring information shall be recorded in a log and kept in the landfill operating record.
3. At variable intervals, review the weekly monitoring information for early warnings and to determine if the leachate collection and pumping system is working properly.
4. Leachate collection piping CCTV inspection and high pressure water jet cleaning results.

Records and Reporting for the Leachate Collection System

Table below displays a list of items/events which must be routinely recorded and kept in the landfill's operating record or submitted to NCDENR Division of Waste Management for the leachate collection system.

Type of Record	Frequency of Recording	Submitted To	Frequency of Submission
Climatic and Precipitation	Daily	Kept in the landfill operating record	To NCDENR upon request
Leachate Generation (per cell) – Pumped Flows	Weekly	Kept in the landfill operating record	To NCDENR upon request
Leachate Collection and Removal System Operations, Pump Run Times (per cell), and Liquid Levels on Bottom Liner (per cell).	Weekly	Kept in the landfill operating record	To NCDENR upon request
Leachate Collection Piping High Pressure Water Jet Cleaning Results	Two years(1)	Kept in the landfill operating record	To NCDENR upon request
Leachate Collection Piping CCTV Inspection Results	At the conclusion of landfill cell construction and five years thereafter(1)	Kept in the landfill operating record and to NCDENR Division of Waste Management as part of construction quality assurance (CQA) documentation for issuance of the Permit to Operate	Initial CCTV inspection included as part of the construction quality assurance (CQA) documentation for issuance of the Permit to Operate from the NCDENR Division of Waste Management and to NCDENR upon request
	(1) After the 5-year leachate collection piping CCTV inspection, a variance from further CCTV inspection and cleaning can be requested from the Division unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.		

A standard checklist for landfill inspections and monitoring is to be developed and appropriately updated as cells and facilities are brought on-line. Landfill Inspection Records shall be kept in the Facility's operating record.

A record of observed climatic and precipitation conditions shall be maintained at the landfill. Such observations need not include detailed statistical data but rather are to present qualitative observations. Climatic conditions shall be recorded daily at the landfill. A rain gauge is to be maintained for determining daily precipitation.

All information contained in the operating record must be easily assessable and furnished upon request to the NCDENR Division of Waste Management.

of NORTH CAROLINA, PLLC

APPENDIX B

Listing of CQA Personnel

JANUARY 2011

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
R. TAYLOR HERBERTSON	RESIDENT SITE MONITOR	RTH
TIM J. SCHREIBER	RESIDENT SITE MONITOR	TJS
THOMAS A. TRIPP	SOILS MONITOR	TAT
WILLIAM PETERSON	HDPE MONITOR	WP
DREW ROPER	HDPE MONITOR	DR

ATLANTIC COAST CONSULTING, INC.

of NORTH CAROLINA, PLLC

APPENDIX C

Resident Manager's Daily Summary Reports

Daily Monitoring Summary

Date: 9/20/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 71 @ am High: 94 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG started placing L-1 of structural fill in the cell. As the material was placed they processed it.

ACC Activities and Test Results: I ran ND tests SF-1 - SF-12 all tests were passing.

Daily Monitoring Summary

Date: 9/20/2010 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: 9/21/2010 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 67 @ am High: 90 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Heiberson

Summary of Construction Progress: EG is continuing to place and process lift-1 of structural fill material.

ACC Activities and Test Results: I observed the activities noted above.

There was no testing performed today the structural fill material was too wet. EG is going to get a tractor and disc on site to till the soil so it will dry faster.

Daily Monitoring Summary

Date: 9/21/2010 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: 9/22/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 71 @ am High: 93 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG is placing lift-1 of structural fill in the cell. The material is too wet so they are tilling it with a tractor and disc.

ACC Activities and Test Results: I ran three water content tests on the structural fill material that is in the cell and it is too wet to get 95% compaction with at this time. EG is tilling the soil trying to dry it out.

- Observed the activities noted above.

Daily Monitoring Summary

Date: 9/22/2010 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: 9/23/2010 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 72 @ am High: 94 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing and compacting structural fill on the cell floor.

All of the material that has been placed is too wet EG is tilling the soil with a tractor and disc.

ACC Activities and Test Results: I ran nuclear density tests SF-13 - SF-30. All tests were passing.

Daily Monitoring Summary

Date: 9/23/2010 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: 9/24/2010 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 66 @ am High: 92 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing and processing structural fill material on the cell floor.

ACC Activities and Test Results: I ran nuclear density tests SF-31 - SF-45 all tests were passing. I also observed the activities noted above.

Daily Monitoring Summary

Date: 9/24/2010 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: 9/25/2010 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 68 @ am High: 90 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG processed areas of lift-1 that have been drying this week.

The forcast is calling for rain tomorrow so EG is sealing everything up.

ACC Activities and Test Results: I ran ND tests SF-46 - SF-57 all tests were passing. I also observed the activities noted above.

Daily Monitoring Summary

Date: 9/25/10 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: 10/4/10 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 49 @ am High: 63 @ pm
Cloud Cover: Cloudy Precipitation: AM Showers Wind: 10-15

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG started to till a few areas so they would start to dry later in the afternoon.

EG did not work last week (9/26-10/1). It was raining most of the week. The ground was too wet for any construction activities.

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

Daily Monitoring Summary

Date: 10/4/10 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: 10/5/10 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 50 @ am High: 64 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued tilling the wet areas of the cell floor.

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

Daily Monitoring Summary

Date: 10/5/10 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: We had a 7:00am progress meeting.

Summary of Health and Safety Issues: None

Submitted by: [signature]
ACC Site Resident Manager

Daily Monitoring Summary

Date: 10/6/10 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 58 @ am High: 70 @ pm
Cloud Cover: Mostly Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG processed about four acres of lift-2. After I tested this area they placed lift-3 on top of it. They also continued placing lift-2 on areas where lift-1 had dried out.

ACC Activities and Test Results: I ran nuclear density tests SF-58 - SF-73 all tests were passing.

I also observed the activities noted above.

Daily Monitoring Summary

Date: 10/6/10 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: 10/7/10 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 55 @ am High: 80 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued working on lifts 1, 2, and 3 of structural fill in cell 2I. They were placing lift-2 over areas of lift-1 that had dryed out. They also continued tilling wet areas of lifts 1, 2, and 3.

ACC Activities and Test Results: I ran nuclear density tests SF-74 - SF-79 all tests were passing.

I also observed the activities noted above.

Daily Monitoring Summary

Date: 10/7/10 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: 10/8/10 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 50 @ am High: 80 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing lift-2 of structural fill material. They also continued filling lifts 1, 2, and 3.

ACC Activities and Test Results: I ran nuclear density tests SF-80 - SF-86 all tests were passing

I also observed the activities noted above.

Daily Monitoring Summary

Date: 10/8/10 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: 10/13/10 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 52 @ am High: 80 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG smooth drum rolled the cell floor because of the rain tomorrow.

10/11 & 10/12 EG was clearing the clay barrow area

10/14 to 10/17 EG is off because of the race.

ACC Activities and Test Results: I ran nuclear density tests SF-87 to SF-117 all tests were passing.

I was not on site mon. and tue. because EG was not working in the cell.

Daily Monitoring Summary

Date: 10/13/10 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: 10/18/10 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 50 @ am High: 81 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG processed the north west section of the cell (lift-2). They also started placing lift-3 in the south west section of the cell.

ACC Activities and Test Results: I ran nuclear density tests SF-118 to SF-133 all tests were passing

I observed the activities noted above.

Daily Monitoring Summary

Date: 10/18/10 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: 10/19/10 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 51 @ am High: 82 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing L-3 in the south west corner of the cell. They also placed lift-1 in the farthest south west corner. - EG also started building the berm on the east side of the cell and placing the final lift on the eastern half of the cell.

ACC Activities and Test Results: I ran nuclear density tests SF-134 to SF-138 all tests were passing

I also observed the activities noted above.

Daily Monitoring Summary

Date: 10/19/10 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: 10/20/10 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 46 @ am High: 74 @ pm
Cloud Cover: Partly Cloudy Precipitation: AM Showers Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG processed lift-1 and lift-3 in the south west corner of the cell. They started placing lift-4 on the east berm and lift-3 on the east side of the cell floor but it started raining.

ACC Activities and Test Results: I ran nuclear density tests SF-139 to SF-145 on lift-1.

Daily Monitoring Summary

Date: 10/20/10 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: 10/21/10 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 48 @ am High: 78 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG placed lifts 4 & 5 on the east berm. Lifts were tested with passing results. They also continued placing lift-3 on the cell floor.

ACC Activities and Test Results: I ran nuclear density tests SF-146 to SF-150 on lift-4 of the east berm.

- I ran ND tests SF-151 to SF-166 on lift-3 of the cell floor

- I ran ND tests SF-167 to SF-171 on lift-5 of the east berm.

- I also observed the activities noted above.

Daily Monitoring Summary

Date: 10/21/10 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: 10/22/10 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 40 @ am High: 70 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG placed and processed lifts 6 & 7 on the east berm. They also continued placing Lift-3 on the cell floor.

ACC Activities and Test Results: I ran nuclear density tests SF-172 to 177 on lift-6 and SF-178 to 183 on lift-7 of the east berm.

I observed the activities noted above.

Daily Monitoring Summary

Date: 10/22/10 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 Hart
ACC Site Resident Manager

Daily Monitoring Summary

Date: 10/23/10 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 39 @ am High: 71 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG placed and processed lift-8 on the east berm. They also continued placing lift-3 on the cell floor sealing everything with the smooth drum roller after it was placed.

ACC Activities and Test Results: I ran nuclear density tests SF-184 to SF-189 on lift-8 of the east berm.

I also observed the activities noted above.

Daily Monitoring Summary

Date: 10/23/00 S M T W T F S

Summary of Surveyor's Activities:

Summary of Problems and Resolutions:

Summary of Meetings and Discussions Held:

Summary of Health and Safety Issues:

Submitted by: Bert Hull
ACC Site Resident Manager

Daily Monitoring Summary

Date: 11/1/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 44 @ am High: 65 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 10-20

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing and processing lift-3 of structural fill.

* There was no work last week due to the weather.

ACC Activities and Test Results: I ran nuclear density tests SF-190 to SF-211 on lift-3 of structural fill. All tests were passing

I also observed the activities noted above.

Daily Monitoring Summary

Date: 11/1/2010 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: 11/2/2010 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 40 @ am High: 63 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing and processing lift-3 of structural fill.

ACC Activities and Test Results: I ran nuclear density tests SF-212 to SF-221 on lift-3 of structural fill.

I observed the activities noted above.

Daily Monitoring Summary

Date: 11/2/2010 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: There was a construction meeting at 7:00am

Summary of Health and Safety Issues: None

Submitted by: [signature]
ACC Site Resident Manager

Daily Monitoring Summary

Date: 11/3/10 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 47 @ am High: 52 @ pm
Cloud Cover: Cloudy Precipitation: Sct. Showers Wind: 5-10

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing and processing lift-3 on the cell floor. They also started placing material on the west berm.

ACC Activities and Test Results: I ran nuclear density tests SF-222 to SF-239. All tests were passing.

I observed the activities noted above.

Daily Monitoring Summary

Date: 11/3/10 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: 11/8/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 38 @ am High: 64 @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG placed and compacted lifts - 2 and 3 in the south west corner of the cell. They also started placing lift-4 on the west side of the cell.

- EG was rained out from 11/4 to 11/7.

ACC Activities and Test Results: I ran nuclear density tests SF-240 to 245 on lift-2 of structural fill. I also ran tests SF-246 to 252 on lift-3 all tests were passing.

I observed the activities noted above.

Daily Monitoring Summary

Date: 11/8/2010 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: 11/9/10 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 41 @ am High: 74 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG processed lift-4 of structural fill and started placing lift-5.

They also built the clay test pad in the borrow area.

ACC Activities and Test Results: I observed the activities noted above and ran nuclear density tests.

- I ran nuclear density tests SF-253 to SF-268 on lift-4 of structural fill.

- I ran nuclear density tests TP-1 to TP-12 and pushed Shelby tubes TPST-1 to TPST-4 on the clay test pad. The Shelby tubes will be sent overnight to the lab.

Daily Monitoring Summary

Date: 11/9/10 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: 11/10/2011 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 42 @ am High: 71 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG started cleaning the tie-in. They also continued placing lift-5 on the west side of the cell.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 11/11/2010 S M T (W) T F S

Summary of Surveyor's Activities: Surveyors were on site steaking the top of subgrade.

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: 11/11/2010 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 33 @ am High: 70 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG placed and processed lift-5 on the west berm and the cell floor. They also continued cleaning off the tie-in and fine grading the cell floor.

ACC Activities and Test Results: I ran nuclear density tests SF-269 to SF-272 on lift-5 on the west berm. I also ran tests SF-273 to SF-283 on the west side of the cell floor.

Daily Monitoring Summary

Date: 11/11/2010 S M T W (T) F S

Summary of Surveyor's Activities: Surveyors were on site steaking the top of subgrade.

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: 11/12/2010 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 34 @ am High: 69 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued fine grading and cleaning off the tie-in. They also continued placing and processing lifts on the west berm.

ACC Activities and Test Results: I observed the activities noted above.

- I ran nuclear density tests SF-284 to SF-297 all tests were passing.
- All tests were ran on the west berm. Lifts - 6 through lift-10 and on lift-4

Daily Monitoring Summary

Date: 11/12/2010 S M T W T (F) S

Summary of Surveyor's Activities: Surveyors were on site steaking the top of subgrade.

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: 11/13/2010 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 33 @ am High: 71 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG is continuing fine grading the top of subgrade.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 11/13/2010 S M T W T F (S)

Summary of Surveyor's Activities: Surveyors were on site checking the top of subgrade.

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: 11/14/2010 (S) M T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 34 @ AM High: 72 @ PM
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued fine grading the cell floor.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 11/15/2010 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: 11/16/2010 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 41 @ am High: 68 @ pm
Cloud Cover: Cloudy Precipitation: Sct. Showers Wind: 5-10

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued fine grading and removing unsuitable areas of subgrade.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 11/16/2010 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: We had our biweekly construction meeting.

Summary of Health and Safety Issues: None

Submitted by: Pat Holt
ACC Site Resident Manager

Daily Monitoring Summary

Date: 11/17/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 37 @ am High: 65 @ pm
Cloud Cover: Sunny Precipitation: None Wind: 10-20

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG started placing and processing lift-1 of clay. They also finished fine grading and digging out the sumps.

ACC Activities and Test Results: I started testing the first section of lift-1. EG is getting the material too wet so they are getting low compaction. They are letting it dry out a little before I retest it.

Daily Monitoring Summary

Date: 11/17/2010 S M T (W) T F S

Summary of Surveyor's Activities: Surveyors were on site finishing their last shots on subgrade and the sumps.

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: 11/18/2010 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 36 @ AM High: 66 @ PM
Cloud Cover: Partly Cloudy Precipitation: NONE Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing and processing lift-1 of clay liner

ACC Activities and Test Results: I ran nuclear density tests CL-1 to CL-32. I pushed shelby tubes ST-1 to ST-7 and sent them to the lab over-night.

Daily Monitoring Summary

Date: 11/18/10 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: 11/19/2010 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 35 @ AM High: 67 @ PM
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberton & Thomas Tripp

Summary of Construction Progress: EG finished placing lift-1 and started placing lift-2. They also continued processing lift-1

ACC Activities and Test Results: I observed the activities noted above.

We ran nuclear density tests CL-33 to CL-62 and pushed shelby tubes ST-8 to ST-15
- All tubes were sent over night to the lab.

Daily Monitoring Summary

Date: 11/19/2010 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: 11/20/2010 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 37 @ AM High: 68 @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberton & Thomas Tripp

Summary of Construction Progress: EG continued placing lift-2 on the cell floor. They finished processing lift-1 and started processing lift-2

ACC Activities and Test Results: We observed the activities noted above.

- We ran nuclear density tests CL-63 to CL-83 and pushed Shelby tubes ST-16 to ST-21. ST-16 to ST-18 were sent over night to the lab. ST-19 to ST-21 will not go out untill monday.

Daily Monitoring Summary

Date: 11/20/2010 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: 11/21/2010 (S) M T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: ____ @ AM High: ____ @ PM
Cloud Cover: ____ Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton & Thomas Tripp

Summary of Construction Progress: EG finished placing and processing lift-2. They started placing lift-3. None of lift-3 has been processed yet.

ACC Activities and Test Results: I ran nuclear density tests CL-84 to CL-136 and pushed Shelby tubes ST-22 to ST-34

We observed the activities noted above.

Daily Monitoring Summary

Date: 11/21/2010 (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: 11/22/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 38 @ AM High: 71 @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson & Tim Schreiber

Summary of Construction Progress: EG continued placing and processing lift-3 of clay liner.

ACC Activities and Test Results: I ran nuclear density tests CL-137 to CL-164 and pushed Shelby tubes ST- to ST-

Daily Monitoring Summary

Date: 11/22/2010 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: 11/23/2010 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 39 @ AM High: 74 @ PM
Cloud Cover: P. Cloudy/M. Cloudy Precipitation: PM Showers Wind: 10-15

ACC Personnel On-Site: Taylor Herbertson & Tim Schreiber

Summary of Construction Progress: EG continued processing lift-3 and started placing lift-4. They also placed and and processed lifts-1 and 2 on the berms and haul roads.

ACC Activities and Test Results: I ran nuclear density tests CL-165 to CL-217 and pushed Shelby tubes ST-42 to ST-50.

We observed the activities noted above.

Daily Monitoring Summary

Date: 11/23/2010 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: Rob Holt
ACC Site Resident Manager

Daily Monitoring Summary

Date: 11/24/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 43 @ AM High: 72 @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson & Taylor Herbertson

Summary of Construction Progress: EG continued placing and processing lift-4 of clay liner.

ACC Activities and Test Results: We ran nuclear density tests CL-218 to CL-237 and pushed shelby tubes ST-51 to ST-54. Samples will be delivered tonight.

Daily Monitoring Summary

Date: 11/24/2010 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: 11/27/2010 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: ____ @ AM High: ____ @ PM
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing and processing lift-4 of clay liner.

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

- I ran nuclear density tests CL-238 to CL-257 and pushed shelby tubes ST-55 to ST-59

Daily Monitoring Summary

Date: 11/27/2010 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: 11/28/2010 (S) M T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 29 @ AM High: 54 @ PM
Cloud Cover: Sunny Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG finished placing lift-4. They also continued processing lift-4.

ACC Activities and Test Results: I ran nuclear density tests CL-258 to CL-277 and pushed Shelby tubes S1-60 to 63. Tubes will be sent out tomorrow.

Observed the activities noted above.

Daily Monitoring Summary

Date: 11/28/2010 (S) M T W T F S

Summary of Surveyor's Activities: None (will be on site tomorrow)

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: 11/29/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 35 @ AM High: 60 @ PM
Cloud Cover: Mostly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG finished processing lift-4 of clay liner.

ACC Activities and Test Results: I ran nuclear density tests CL-278 to CL-321 and pushed shelby tubes ST-64 to ST-72

I also observed the activities noted above.

Daily Monitoring Summary

Date: 11/29/2010 S (M) T W T F S

Summary of Surveyor's Activities: Surveyors were on site steaking the final lift of clay liner.

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

Geosynthetic Installation Monitoring Report

Date: 12/6/10 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: EST ran four fusion welded trial seams

Geosynthetic Deployment Activities: EST deployed approx. 170,000 sq.ft. of HDPE

Field Seaming Activities: Panels P-1 to P-19 were all fusion welded. EST ran four fusion guns. They also welded the the tie-in.

Non-Destructive Testing: All fusion welded panels were air tested. except for the the tie-in.

Destructive Testing: We marked destructs DS-1 to DS-19 no samples have been cut.

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/7/10 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran 10 trial seams 8 fusion and 2 extrusion. All were passing

Geosynthetic Deployment Activities: ESI deployed panels P-20 to P-51

Field Seaming Activities: ESI fusion welded all panels that were deployed. ESI also started extrusion welding repairs.

Non-Destructive Testing: ESI ran air tests on some of the fusion welded seams.

Destructive Testing: ESI cut destructs D2-1 to D5-31 and DX-1 Samples were sent overnight to the lab.

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/8/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran a total of 5 fusion and 2 extrusion welded trial seams.

Geosynthetic Deployment Activities: ESI deployed panels P-52 to P-81

Field Seaming Activities: ESI fusion welded panels as they were deployed. They also continued extrusion welding repairs

Non-Destructive Testing: They continued air testing fusion welded seams.

Destructive Testing: ESI cut destructs DS-32 to DS-41 and DX-2 they were sent overnight to the lab.

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/9/10 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran a total of 4 fusion and 2 extrusion welded trial seams.

Geosynthetic Deployment Activities: ESI deployed panels P-82 to P-84.

Field Seaming Activities: ESI fusion welded the remaining seams and continued extrusion welding patches.

Non-Destructive Testing: ESI did air tests on all of the remaining fusion welded seams.

Destructive Testing: Destructs DS-42 to DS-51 were cut and sent to the lab also DX-3 & 4

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/10/10 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran a total of 12 trial seams 4 extrusion and 8 fusion. All were passing

Geosynthetic Deployment Activities: ESI deployed approx. 123,244 sq. ft. of HDPE. Panels P-86 to P-115

Field Seaming Activities: All panels that were deployed today were fusion welded, ESI continued making repairs using the extrusion gun.

Non-Destructive Testing: ESI air tested and vacuum tested.

Destructive Testing: Destructs DS-52 to DS-62 and DX-5 were sent to the lab.

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/11/2010 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: EST ran a total of 20 trial seams. 4 extrusion and 16 fusion.

Geosynthetic Deployment Activities: EST deployed panels P-116 to P-151 of 60 mil textured HDPE.

Field Seaming Activities: EST fusion welded all panels. They also continued extrusion welding repairs.

Non-Destructive Testing: EST did air testing and vacuum testing.

Destructive Testing: DS-63 to DS-74 were cut but wont be sent out till monday. They also cut DX-6.

General Remarks: None.

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/13/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: ESI ran a total of 4 extrusion welded trial seams.

Geosynthetic Deployment Activities: None

Field Seaming Activities: ESI continued making repairs.

Non-Destructive Testing: ESI finished air testing and continued vacuum testing.

Destructive Testing: ESI cut samples DS-75 to DS-78 and DX-7 to DX-9. Samples will be sent over night to the lab.

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/14/2010 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: EST started deploying the geocomposite.

Field Seaming Activities: The composite is being zip-tied and sewn together.

Non-Destructive Testing: EST finished all vacuum testing.

Destructive Testing: None

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/15/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI continued deployment of geocomposite.

Field Seaming Activities: Geocomposite is being zip-tied and sewn together.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/16/2010 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI continued the deployment of geocomposite.

Field Seaming Activities: The geocomposite is being zip-tied and sewn together.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/17/2010 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: EST continued deployment of geocomposite.

Field Seaming Activities: The geocomposite is being zip-tied and sewn together.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/18/2010 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI continued deployment of geocomposite.

Field Seaming Activities: The geocomposite is being zip-tied and sewn together.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Geosynthetic Installation Monitoring Report

Date: 12/19/2010 (S) M T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: EST continued deployment of geocomposite.

Field Seaming Activities: The geocomposite is being zip-tied and sewn together.

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: None

Submitted by: [signature]
ACC Site Resident Manager

Daily Monitoring Summary

Date: 12/20/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 19° @ am High: 43° @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10 mph

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG started placing the protective cover material in the cell. The material is being placed in a two foot lift.

ACC Activities and Test Results: I observed the activites noted above.

Daily Monitoring Summary

Date: 12/20/2010 S (M) T W T F S

Summary of Surveyor's Activities: Surveyor was on site.

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

Geosynthetic Installation Monitoring Report

Date: 12/20/2010 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina

Trial Seaming Activities: None

Geosynthetic Deployment Activities: ESI finished all work today.

Field Seaming Activities: None

Non-Destructive Testing: None

Destructive Testing: None

General Remarks: Today ESI did clean up and packed up all their equipment.

Submitted by: [signature]
ACC Site Resident Manager

Daily Monitoring Summary

Date: 12/21/2010 S M (T) W T F S

Project Number: 1001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 29° @ am High: 45° @ pm
Cloud Cover: Mostly Cloudy Precipitation: None Wind: 0-5 mph

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing protective cover material in the cell.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/21/2010 S M (T) W T F S

Summary of Surveyor's Activities: The surveyor was on site.

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: 12/22/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 37° @ am High: 54° @ pm
Cloud Cover: Mostly Sunny Precipitation: None Wind: 0-5 mph

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing protective cover material in the cell. The material is being placed in a two foot lift.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/22/2010 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: 12/23/2010 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 35° @ am High: 50° @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberlson

Summary of Construction Progress: EG continued placing protective cover.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/23/2010 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: 12/24/2010 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 33° @ am High: 47° @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG worked on the barrow pit. They also continued placing protective cover.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/24/2010 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: 12/28/2010 S M (T) W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 30 @ AM High: 49 @ PM
Cloud Cover: Sunny Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG continued placing protective cover material.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/28/2010 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: 12/29/2010 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 33 @ AM High: 51 @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herberlson

Summary of Construction Progress: EG continued placing protective cover material.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/29/2010 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: 12/30/2010 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 34° @ AM High: 54° @ PM
Cloud Cover: Mostly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing protective cover material.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/30/2010 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 Hart
ACC Site Resident Manager

Daily Monitoring Summary

Date: 12/31/2010 S M T W T (F) S

Project Number: 1001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 36° @ AM High: 58° @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing protective cover material.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 12/31/2010 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: 1/3/2011 S (M) T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 33° @ am High: 51° @ pm
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued placing protective cover material in the cell.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/3/2011 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: 1/4/2011 S M (T) W T F S

Project Number: 1001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 30° @ AM High: 50° @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG finished placing the protective cover and started building the interim berm. PFF is now on site and welding the leachate collection line, risers, and force main.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/4/2011 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: 1/5/2011 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 28° @ AM High: 40° @ PM
Cloud Cover: Mostly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG installed the leachate collection line and two risers on the west side of the cell. They also continued building the interim berm.

PFF finished welding the leachate collection pipe and risers. They are now welding the force maine.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/5/2011 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: 1/6/2011 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 31° @ AM High: 41° @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herberton

Summary of Construction Progress: EG continued building the interim berm. They also continued installing the leachate collection lines. The collection line on the west side of the cell is done now they are working on the two on the east side of the cell. Both risers were also installed on the east sump.

PFF finished welding all of the force main pipe. They installed and tested the force main on the west side of the cell.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/6/2011 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: 1/7/2011 S M T W T (F) S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 32° @ AM High: 43° @ PM
Cloud Cover: Partly Cloudy Precipitation: PM Showers Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: EG finished the interim berm and both leachate lines on the east side of the cell.

PFF completed all work on the risers, force main, and clean out on the west side of the cell.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/7/2011 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: 1/8/2011 S M T W T F (S)

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 28 @ am High: 40 @ pm
Cloud Cover: Cloudy Precipitation: None Wind: 0-5

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: PFF installed the force main on the east side of the cell. They started on the last couple welds that had to be made to tie-in to the riser. PFF also welded on all of the clean-out caps for the leachate collection line.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/8/2011 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: 1/9/2011 (S) M T W T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 18° @ AM High: 33° @ PM
Cloud Cover: Partly Cloudy Precipitation: None Wind: 5-10

ACC Personnel On-Site: Taylor Herbertson

Summary of Construction Progress: PFF air tested the force main on the east side of the cell. They also did some clean up and bolted on all of the blinds for the risers, force main, and the pipes for existing cells that Albert wanted done.

PFF is done with all work.

ACC Activities and Test Results: I observed the activities noted above.

Daily Monitoring Summary

Date: 1/9/2011 (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: 1/18/11 S M (T) W T F S

Project Number: 1001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 35 @ am High: 50° @ pm
Cloud Cover: cloudy Precipitation: Drizzle Wind: LT.

ACC Personnel On-Site: Drew Roper

Summary of Construction Progress:

EG working on finishing the Temp. Berm of cell 2I south-end.
EG utilizing 2" pump to remove water at western sump area.

ACC Activities and Test Results:

Acc observed all of todays progress.

Daily Monitoring Summary

Date: 1/18/11 S M T W T F S

Summary of Surveyor's Activities: Brannon Surveying Protective Cover

Summary of Problems and Resolutions: N/A

Summary of Meetings and Discussions Held: N/A

Summary of Health and Safety Issues: N/A

Submitted by: Drew Rogers
ACC Site Resident Manager

Daily Monitoring Summary

Date: 1/19/11 S M T (W) T F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 36° @ pm High: 53° @ pm
Cloud Cover: cloudy Precipitation: 0 Wind: LT.

ACC Personnel On-Site: Drew Roper

Summary of Construction Progress:

(1) Today, EG continued to finish the south-end Temp Berm at cell 2I as well as continuing to pump water (2" pump) at the western sump area.

(2) HRW Electric completed 100' of 2" conduit at the westside of cell 2I, and finished 700' on the eastside of the cell.
x coming in next monday to pull wire

ACC Activities and Test Results:

Acc monitored all of today's construction progress.

Daily Monitoring Summary

Date: 1/19/11 S M T (W) T F S

Summary of Surveyor's Activities: N/A

Summary of Problems and Resolutions: N/A

Summary of Meetings and Discussions Held:

Meeting with Republic + SLS + EG — (0700)
Liner will start next wednesday to finish
temp berm cover.

Summary of Health and Safety Issues: N/A

Submitted by: [signature]
ACC Site Resident Manager

Daily Monitoring Summary

Date: 1/20/11 S M T W (T) F S

Project Number: I001.154
Project Title: CMS Landfill V Cell 2I
Location: Charlotte, North Carolina
Weather: Temperature: Low: 35° @ am High: 55° @ pm
Cloud Cover: Clear Precipitation: Ø Wind: Ø

ACC Personnel On-Site: Drew Roper

Summary of Construction Progress:

EG has completed Cell 2I Temp Berm on the Southend. –

H+W Electric has completed All conduit on the East + Westsides of Cell 2I.

Sunyer has completed shots on The Protective Cover.

ACC Activities and Test Results: ✓

Daily Monitoring Summary

Date: 1/20/11 S M T W (T) F S

Summary of Surveyor's Activities: Surveyor has completed Surveying of Protective Cover.

Summary of Problems and Resolutions: N/A

Summary of Meetings and Discussions Held: N/A

Summary of Health and Safety Issues: N/A

Submitted by: Drew Rop
ACC Site Resident Manager

of NORTH CAROLINA, PLLC

APPENDIX D

Structural Fill 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 (SF-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 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
10086	SF-1	-	-	-	-	-	-	-	-	33.1	82.3	-	-	-
10087	SF-2	-	-	-	-	-	-	-	-	23.0	97.0	-	-	-
10088	SF-3	-	-	-	-	-	-	-	-	18.1	110.9	-	-	-
10169	SF-4	-	-	-	-	-	-	-	-	24.9	96.5	-	-	-

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
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Web: www.test-llc.com

Tested By	DG/RI
Date	09/15/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10086/SF-1	Depth/Elev.	-
Location	-	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	22100.0	15909.4
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	7.4	7.4
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

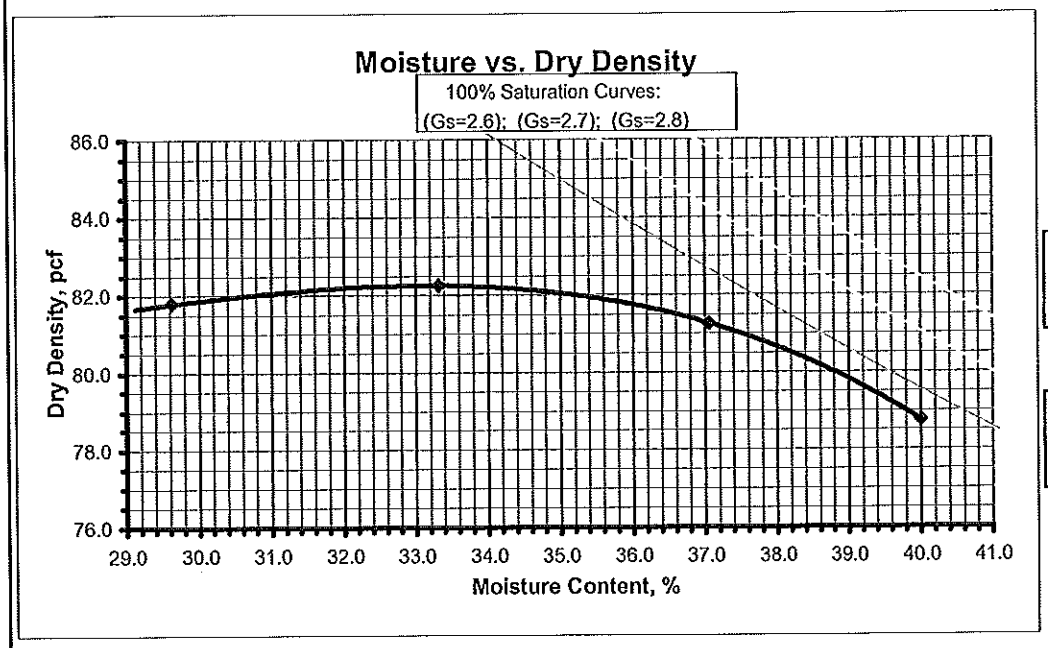
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	1260.5	7.4
Mass of Dry Sample & Tare, g	1024.5	7.4
Mass of Tare, g	418.0	0.0
Moisture Content, %	38.9	0.0

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5852.0	5907.0	5933.0	5916.0	
Mass of Wet Sample & Tare, g	545.0	523.0	562.5	579.0	
Mass of Dry Sample & Tare, g	448.9	421.4	444.2	449.0	
Mass of Tare, g	124.5	116.5	125.0	124.0	
Moisture Content, %	29.6	33.3	37.1	40.0	
Wet Density, pcf	106.0	109.7	111.4	110.3	
Dry Density, pcf	81.8	82.3	81.3	78.8	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	82.3	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	33.1	**Corrected Optimum Moisture Content, %**	NA

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/DG
		Date	09/15/10
		Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10087/SF-2	Depth/Elev.	-
Location	-	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	21500.0	16202.2
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	79.0	79.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	
Material Retained on 3/8" Sieve, %	0.5
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.5

MOISTURE CONTENT

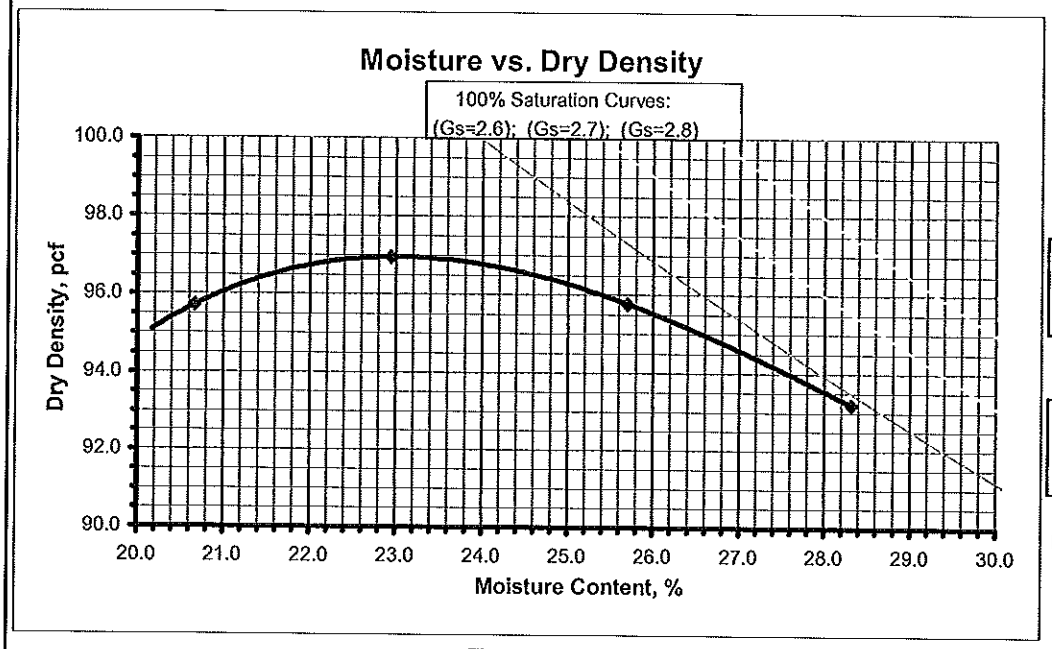
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	952.0	79.0
Mass of Dry Sample & Tare, g	780.5	79.0
Mass of Tare, g	256.0	0.0
Moisture Content, %	32.7	0.0

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5995.0	6051.0	6069.0	6057.0	
Mass of Wet Sample & Tare, g	840.0	850.0	544.0	535.5	
Mass of Dry Sample & Tare, g	771.5	773.5	456.9	444.8	
Mass of Tare, g	440.0	440.0	118.0	124.5	
Moisture Content, %	20.7	22.9	25.7	28.3	
Wet Density, pcf	115.5	119.2	120.4	119.6	
Dry Density, pcf	95.7	97.0	95.8	93.2	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	97.0	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	23.0	**Corrected Optimum Moisture Content, %**	NA

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/DG
		Date	09/15/
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10088/SF-3	Depth/Elev.	-
Location	-	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	24500.0	21212.3
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	934.0	934.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

MOISTURE CONTENT

	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	958.5	934.0
Mass of Dry Sample & Tare, g	864.5	934.0
Mass of Tare, g	258.0	0.0
Moisture Content, %	15.5	0.0

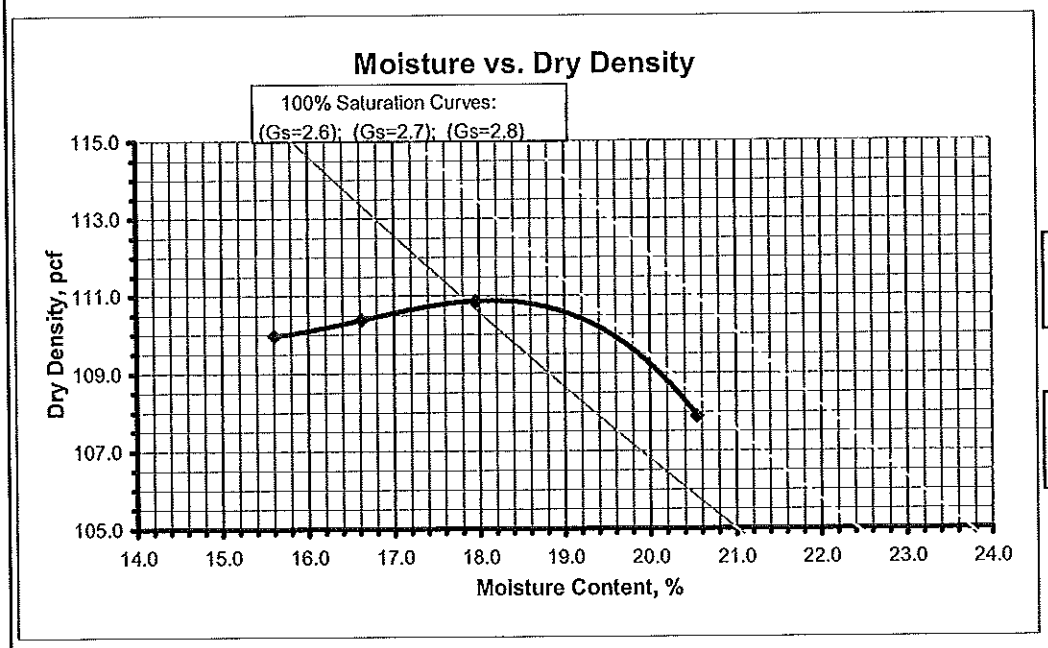
Material Retained on No. 4 Sieve, %	
Material Retained on 3/8" Sieve, %	4.4
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	4.4

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	6171.0	6195.0	6226.0	6215.0	
Mass of Wet Sample & Tare, g	643.0	639.0	684.5	644.0	
Mass of Dry Sample & Tare, g	573.0	565.6	599.3	555.5	
Mass of Tare, g	124.5	124.0	125.0	125.0	
Moisture Content, %	15.6	16.6	18.0	20.5	
Wet Density, pcf	127.1	128.7	130.8	130.1	
Dry Density, pcf	110.0	110.4	110.9	107.9	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	110.9	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	18.1	**Corrected Optimum Moisture Content, %**	NA

TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AASHTO R18	Tested By: RI Date: 09/24/10 Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10169/SF-4	Depth/Elev.	-
Location	-	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	23100.0	17519.1
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	75.5	75.5
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

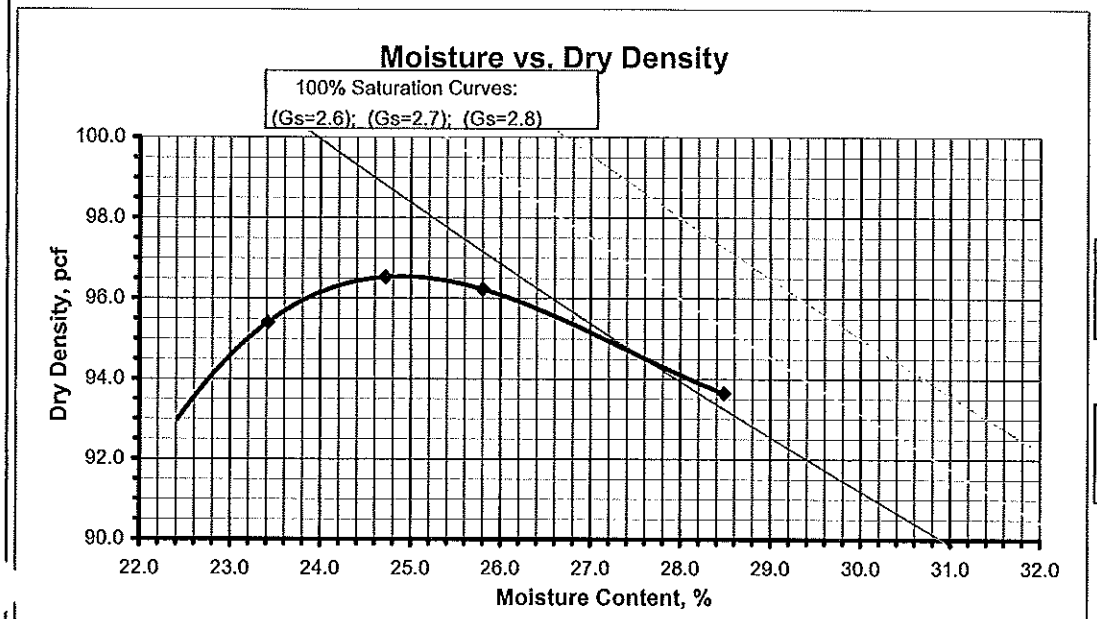
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	967.8	75.5
Mass of Dry Sample & Tare, g	773.0	75.5
Mass of Tare, g	161.5	0.0
Moisture Content, %	31.9	0.0

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	6029.0	6069.0	6079.0	6068.0	
Mass of Wet Sample & Tare, g	514.5	529.0	557.5	548.5	
Mass of Dry Sample & Tare, g	440.5	440.0	469.0	454.5	
Mass of Tare, g	124.5	80.0	126.0	124.5	
Moisture Content, %	23.4	24.7	25.8	28.5	
Wet Density, pcf	117.7	120.4	121.1	120.3	
Dry Density, pcf	95.4	96.5	96.2	93.6	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	96.5	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	24.9	**Corrected Optimum Moisture Content, %**	NA

of NORTH CAROLINA, PLLC

APPENDIX E

Structural Fill Field Test Results

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-1	9/20	N 583260	L-1	N	93.5	20.1	SF-2	97.0	23.0	96.4	-2.9	P	
		E 505140											
SF-2		N 583250			94.0	22.2				96.9	-0.8	P	
		E 505250											
SF-3		N 583310			93.9	20.0				96.8	-3.0	P	
		E 505280											
SF-4		N 583330			93.7	20.7				96.6	-2.3	P	
		E 505360											
SF-5		N 583220			93.7	22.2				96.6	-0.8	P	
		E 505370											
SF-6		N 583270			80.8	36.3	SF-1	82.3	33.1	98.2	+3.2	P	
		E 505430											
SF-7		N 583340			81.1	35.0				98.5	+1.9	P	
		E 505490											
SF-8		N 583350			79.8	38.2				96.9	+5.1	P	
		E 505570											
SF-9		N 583330			81.4	34.3				98.9	+1.2	P	
		E 505650											
SF-10		N 583370			81.5	36.2				99.0	+3.1	P	
		E 505740											
SF-11		N 583260			80.3	37.4				97.6	+4.3	P	
		E 505540											
SF-12		N 583260			79.9	37.8				97.1	+4.7	P	
		E 505620											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-13	9/23	N 583830	L-1	N	94.9	27.6	SF-2	97.0	23.0	97.8	+4.6	P	
		E 505650											
SF-14		N 583760			92.9	29.8				95.8	+6.8	P	
		E 505650											
SF-15		N 583820			92.7	29.3				95.6	+6.3	P	
		E 505740											
SF-16		N 583750			92.5	29.0				95.4	+6.0	P	
		E 505720											
SF-17		N 583740			96.1	26.3				99.1	+3.3	P	
		E 505850											
SF-18		N 583840			81.4	36.9	SF-1	82.3	33.1	98.9	+3.8	P	
		E 505850											
SF-19		N 583850			80.6	37.4				97.9	+4.3	P	
		E 505960											
SF-20		N 583870			80.8	36.7				98.2	+3.6	P	
		E 506030											
SF-21		N 583870			79.4	37.7				96.5	+4.6	P	
		E 506130											
SF-22		N 583740			93.7	28.1	SF-2	97.0	23.0	96.6	+5.1	P	
		E 506150											
SF-23		N 583720			95.3	27.6				98.2	+4.6	P	
		E 506040											
SF-24		N 583760			80.5	36.5	SF-1	82.3	33.1	97.8	+3.4	P	
		E 505970											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-25	9/23	N 583650	L-1	N	80.5	37.4	SF-1	82.3	33.1	97.8	+4.3	P	
		E 505640											
SF-26		N 583620			81.5	37.0				99.0	+3.9	P	
		E 505750											
SF-27		N 583640			80.5	37.1				97.8	+4.0	P	
		E 505830											
SF-28		N 583670			92.8	29.6	SF-2	97.0	23.0	95.7	+6.6	P	
		E 505930											
SF-29		N 583550			94.1	28.6				97.0	+5.6	P	
		E 505650											
SF-30		N 583460			92.7	29.1				95.6	+6.1	P	
		E 505650											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
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N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-31	9/24	N 583570	L-1	N	95.4	16.2	SF-2	97.0	23.0	98.4	-6.8	P	
		E 505730											
SF-32		N 583670			94.1	23.1				97.0	+0.1	P	
		E 506150											
SF-33		N 583660			93.5	20.0				96.4	-3.0	P	
		E 506230											
SF-34		N 583480			93.4	19.6				96.3	-3.4	P	
		E 506020											
SF-35		N 583450			93.2	21.7				96.1	-1.3	P	
		E 506150											
SF-36		N 583370			95.3	23.4				98.2	+0.4	P	
		E 506130											
SF-37		N 583380			95.5	21.9				98.5	-1.1	P	
		E 506050											
SF-38		N 583350			93.5	20.4				96.4	-2.6	P	
		E 505930											
SF-39		N 583380			92.9	23.0				95.8	0	P	
		E 505880											
SF-40		N 583290			94.6	23.1				97.5	+0.1	P	
		E 505820											
SF-41		N 583410			95.7	22.6				98.7	-0.4	P	
		E 505750											
SF-42		N 583450			93.6	19.4				96.5	-3.6	P	
	↓	E 505880	↓	↓			↓	↓	↓				

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-43	9/24	N 583480	L-1	N	93.4	21.9	SF-2	97.0	23.0	96.3	-1.1	P	
		E 505970											
SF-44		N 583540			92.7	21.1				95.6	-1.9	P	
		E 505930											
SF-45		N 583530			94.4	22.5				97.3	-0.5	P	
		E 505830											
		N											
		E											
		N											
		E											
		N											
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N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-46	9/25	N 583560	L-1	N	109.9	13.1	SF-3	110.9	18.1	99.1	-5.0	P	
		E 505550											
SF-47		N 583440			95.3	23.2	SF-2	97.0	23.0	98.2	+0.2	P	
		E 505550											
SF-48		N 583430			95.5	21.6				98.5	-1.4	P	
		E 505450											
SF-49		N 583540			95.4	22.3				98.4	-0.7	P	
		E 505440											
SF-50		N 583540			107.9	14.4	SF-3	110.9	18.1	97.3	-3.7	P	
		E 505360											
SF-51		N 583420			107.6	16.5				97.0	-1.6	P	
		E 505330											
SF-52		N 583460			97.0	23.5	SF-2	97.0	23.0	100.0	+0.5	P	
		E 505280											
SF-53		N 583580			96.1	22.4				99.1	-0.6	P	
		E 505270											
SF-54		N 583550			94.9	21.5				97.8	-1.5	P	
		E 505150											
SF-55		N 583440			96.8	22.6				99.8	-0.4	P	
		E 505160											
SF-56		N 583420			93.1	27.5				95.9	+4.5	P	
		E 505070											
SF-57		N 583530			94.7	27.9				97.6	+4.9	P	
		E 505080											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-58	10/6	N 3550	L-2	N	82.2	38.1	SF-1	82.3	33.1	99.9	+5	P	
		E 5980											
SF-59		N 3640			81.9	40.2				99.5	+7.1	P	
		E 5950											
SF-60		N 3750			105.9	20.3	SF-3	110.9	18.1	95.5	+2.2	P	
		E 5950											
SF-61		N 3880			105.7	18.5				95.3	+0.4	P	
		E 5970											
SF-62		N 3850			105.7	19.6				95.3	+1.5	P	
		E 5860											
SF-63		N 3770			105.7	17.6				95.3	-0.5	P	
		E 5850											
SF-64		N 3630			105.6	21.3				95.2	+3.2	P	
		E 5870											
SF-65		N 3520			108.0	18.0				97.4	-0.1	P	
		E 5850											
SF-66		N 3550			107.5	18.8				96.9	+0.7	P	
		E 5730											
SF-67		N 3650			107.6	17.5				97.0	-0.6	P	
		E 5750											
SF-68		N 3780			107.1	18.5				96.6	+0.4	P	
		E 5750											
SF-69		N 3960			108.1	18.1				97.5	Ø	P	
		E 5780											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-70	10/6	N 3820	L-2	N	105.6	21.5	SF-3	110.9	18.1	95.2	+3.4	P	
		E 5630											
SF-71		N 3740			107.4	18.5				96.8	+0.4	P	
		E 5640											
SF-72		N 3630			108.4	17.5				97.7	-0.6	P	
		E 5630											
SF-73		N 3530			108.0	18.6				97.4	+0.5	P	
		E 5670											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-74	10/7	N 583750	L-1	N	105.7	17.3	SF-3	110.9	18.1	95.3	-0.8	P	
		E 1505530											
SF-75		N 3770			106.5	17.9				96.0	-0.2	P	
		E 5450											
SF-76		N 3740			107.3	16.0				96.8	-2.1	P	
		E 5330											
SF-77		N 3640			108.7	15.3				98.0	-2.8	P	
		E 5330											
SF-78		N 3670			106.9	17.4				96.4	-0.7	P	
		E 5420											
SF-79		N 3650			106.9	16.4				96.4	-1.7	P	
	↓	E 5560	↓	↓			↓	↓	↓				
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 10/20/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-80	10/8	N 583740	L-1	N	107.4	15.5	SF-3	110.9	18.1	96.8	-2.6	P	
		E 1505250											
SF-81		N 3750			108.0	14.4				97.4	-3.7	P	
		E 5170											
SF-82		N 3660			107.1	16.8				96.6	-1.3	P	
		E 5140											
SF-83		N 3640			107.2	16.0				96.7	-2.1	P	
		E 5250											
SF-84		N 3360	L-2		106.6	15.5				96.1	-2.6	P	
		E 5530											
SF-85		N 3350			105.6	16.5				95.2	-1.6	P	
		E 5650											
SF-86		N 3370			107.5	14.7				96.9	-3.4	P	
		E 5770											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-87	10/13	N 588840	L-2	N	105.8	13.5	SF-3	110.9	18.1	95.4	-4.6	P	
		E 1506050											
SF-88		N 3830			106.7	12.7				96.2	-5.4	P	
		E 6130											
SF-89		N 3740			92.4	24.8	SF-2	97.0	23.0	95.3	+1.8	P	
		E 6050											
SF-90		N 3740			106.8	13.8	SF-3	110.9	18.1	96.3	-4.3	P	
		E 6160											
SF-91		N 3640			94.5	19.6	SF-2	97.0	23.0	97.4	-3.4	P	
		E 6050											
SF-92		N 3640			96.0	19.2				98.9	-3.8	P	
		E 6160											
SF-93		N 3660			105.7	13.1	SF-3	110.9	18.1	95.3	-5	P	
		E 6220											
SF-94		N 3530			95.3	20.4	SF-2	97.0	23.0	98.2	-2.6	P	
		E 6050											
SF-95		N 3550			95.0	19.1				97.9	-3.9	P	
		E 6150											
SF-96		N 3450			94.5	22.3				97.4	-0.7	P	
		E 6050											
SF-97		N 3420			93.7	23.1				96.6	+0.1	P	
		E 6130											
SF-98		N 3340			106.5	13.0	SF-3	110.9	18.1	96.0	-5.1	P	
		E 6030											

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SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-99	10/13	N 583360	L-2	N	105.9	14.7	SF-3	110.9	18.1	95.5	-3.4	P	
		E 1506130											
SF-100		N 3280			105.9	15.4				95.5	-2.7	P	
		E 5740											
SF-101		N 3270			92.5	25.1	SF-2	97.0	23.0	95.4	+2.1	P	
		E 5660											
SF-102		N 3260			95.0	25.9				97.9	+2.9	P	
		E 5540											
SF-103		N 3240			93.2	22.8				96.1	-0.2	P	
		E 5440											
SF-104		N 3260			93.6	26.2				96.5	+3.2	P	
		E 5330											
SF-105		N 3250			106.8	15.5	SF-3	110.9	18.1	96.3	-2.6	P	
		E 5250											
SF-106		N 3240			106.9	14.3				96.4	-3.8	P	
		E 5140											
SF-107		N 3340			93.8	25.3	SF-2	97.0	23.0	96.7	-2.3	P	
		E 5250											
SF-108		N 3340			92.7	23.9				95.6	+0.9	P	
		E 5360											
SF-109		N 3350			93.7	24.1				96.6	+1.1	P	
		E 5450											
SF-110		N 3450			93.4	24.8				96.3	+1.8	P	
		E 5760											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [signature]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-111	10/13	N 583450	L-2	N	108.3	13.3	SF-3	110.9	18.1	97.7	-4.8	P	
		E 1805640											
SF-112		N 3470			106.6	16.0				96.1	-2.1	P	
		E 5540											
SF-113		N 3440			106.5	13.7				96.0	-4.4	P	
		E 5450					↓	↓	↓				
SF-114		N 3440			94.4	21.1	SF-2	97.0	23.0	97.3	-1.9	P	
		E 5350											
SF-115		N 3430			94.5	25.5				97.4	+2.5	P	
		E 5250											
SF-116		N 3480			94.0	22.0				96.9	-1.0	P	
		E 5150											
SF-117		N 3440			93.6	23.7				96.5	+0.7	P	
	↓	E 5070	↓	↓			↓	↓	↓				
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-118	10/18	N 583830	L-2	N	93.4	25.2	SF-2	97.0	23.0	96.3	+2.2	P	
		E 1505550											
SF-119		N 3740			92.7	25.4				95.6	+2.4	P	
		E 5550											
SF-120		N 3740			93.4	24.1				96.3	+1.1	P	
		E 5450											
SF-121		N 3740			93.8	25.5				96.7	+2.5	P	
		E 5350											
SF-122		N 3760			94.1	24.8				97.0	+1.8	P	
		E 5250											
SF-123		N 3740			93.3	25.1				96.2	+2.1	P	
		E 5150											
SF-124		N 3650			96.0	24.7				98.9	+1.7	P	
		E 5150											
SF-125		N 3660			95.0	24.5				97.9	+1.5	P	
		E 5250											
SF-126		N 3630			93.5	25.4				96.4	+2.4	P	
		E 5340											
SF-127		N 3660			93.0	27.6				95.9	+4.6	P	
		E 5450											
SF-128		N 3640			95.1	25.5				98.0	+2.5	P	
		E 5550											
SF-129		N 3540			97.8	26.3				95.7	+3.3	P	
		E 5550											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-130	10/18	N 583560	L-2	N	94.9	24.8	SF-2	97.0	23.0	97.8	+1.8	P	
		E 1805450											
SF-131		N 3530			95.3	25.8				98.2	+2.8	P	
		E 5330											
SF-132		N 3550			95.2	24.7				98.1	+1.7	P	
		E 5250											
SF-133		N 3540			95.3	24.3				98.2	+1.3	P	
		E 5150											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-134	10/19	N 583920	L-3	N	80.7	41.3	SF-1	82.3	33.1	98.0	+8.2	P	
		E 1506130											
SF-135		N 3810			82.1	40.2				99.8	+7.1	P	
		E 6160											
SF-136		N 3670			81.4	38.5				99.5	+5.4	P	
		E 6230											
SF-137		N 3530			80.2	40.3				97.4	+7.2	P	
		E 6180											
SF-138		N 3360			81.2	41.3				98.7	+8.2	P	
		E 6140											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-139	10/20	N 583140	L-1	N	81.8	38.9	SF-1	82.3	33.1	99.4	+5.8	P	
		E 1504870											
SF-140		N 3190			81.4	38.5				98.9	+5.4	P	
		E 4950											
SF-141		N 3190			81.9	39.7				99.5	+6.6	P	
		E 5080											
SF-142		N 3240			81.0	41.1				98.4	+8.0	P	
		E 4990											
SF-143		N 3270			93.0	28.9	SF-2	97.0	23.0	95.9	+5.9	P	
		E 5060											
SF-144		N 3340			92.9	26.5				95.8	+3.5	P	
		E 5040											
SF-145		N 3350			80.9	42.6	SF-1	82.3	33.1	98.3	+9.5	P	
		E 5170											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/14/06

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-146	10/21	N 583910	L-4	N	94.3	31.1	SF-2	97.0	23.0	97.2	+8.1	P	
		E 1506120											
SF-147		N 3780			93.9	30.5				96.8	+7.5	P	
		E 6180											
SF-148		N 3660			95.1	29.4				98.0	+6.4	P	
		E 6220											
SF-149		N 3480			95.6	30.5				98.6	+7.5	P	
		E 6170											
SF-150		N 3340			96.0	28.7				98.9	+5.7	P	
		E 6130											
SF-151		N 3250	L-3		80.7	34.5	SF-1	82.3	33.1	98.1	+1.4	P	
		E 5150											
SF-152		N 3260			80.6	33.2				97.9	+0.1	P	
		E 5270											
SF-153		N 3230			81.0	33.4				98.4	+0.3	P	
		E 5330											
SF-154		N 3280			79.9	39.9				97.1	+6.8	P	
		E 5480											
SF-155		N 3250			81.7	37.4				99.3	+4.3	P	
		E 5590											
SF-156		N 3280			80.2	35.2				97.4	+2.1	P	
		E 5680											
SF-157		N 3280			79.8	38.5				96.9	+5.4	P	
		E 5780											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-158	10/21	N 583380	L-3	N	80.8	35.2	SF-1	82.3	33.1	98.2	+2.1	P	
		E 1505780											
SF-159		N 3370			80.3	35.4				97.6	+2.3	P	
		E 5680											
SF-160		N 3340			80.2	40.7				97.4	+7.6	P	
		E 5550											
SF-161		N 3370			80.6	35.8				97.9	+2.7	P	
		E 5450											
SF-162		N 3330			79.4	35.2				96.5	+2.1	P	
		E 5370											
SF-163		N 3350			79.2	40.3				96.2	+7.2	P	
		E 5270											
SF-164		N 3450			80.9	35.5				98.3	+2.4	P	
		E 5230											
SF-165		N 3450			80.3	34.7				97.6	+1.6	P	
		E 5350											
SF-166		N 3450			80.4	38.4				97.7	+5.3	P	
		E 5480											
SF-167		N 3880	L-5		80.7	38.9				98.1	+5.8	P	
		E 6140											
SF-168		N 3710			81.6	36.2				99.1	+3.1	P	
		E 6210											
SF-169		N 3550			80.5	39.5				97.8	+6.4	P	
		E 6190											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-170	10/21	N 583460	L-5	N	81.0	35.4	SF-1	82.3	33.1	98.4	+2.3	P	
		E 1506160											
SF-171		N 3350			80.7	37.1				98.1	+4.0	P	
		E 6140											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
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PROJECT LOCATION: Charlotte, North Carolina

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REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-172	10/22	N 583920	L-6	N	79.4	35.5	SF-1	82.3	33.1	96.5	+2.4	P	
		E 1506130											
SF-173		N 3840			79.5	33.7				96.6	+0.6	P	
		E 6150											
SF-174		N 3770			80.6	35.1				97.9	+2.0	P	
		E 6190											
SF-175		N 3650			78.5	37.4				95.4	+4.3	P	
		E 6220											
SF-176		N 3470			80.2	37.5				97.4	+4.4	P	
		E 6160											
SF-177		N 3330			80.9	36.9				98.3	+3.8	P	
		E 6130	↓				↓	↓	↓				
SF-178		N 3880	L-7		94.1	27.5	SF-2	97.0	23.0	97.0	+4.5	P	
		E 6140											
SF-179		N 3780			94.8	30.0				97.7	+7.0	P	
		E 6190											
SF-180		N 3610			93.5	27.6				96.4	+4.6	P	
		E 6210											
SF-181		N 3530			95.4	28.6				98.4	+5.6	P	
		E 6190											
SF-182		N 3450			95.1	26.3				98.0	+3.3	P	
		E 6160											
SF-183		N 3330			95.6	25.4				98.6	+2.4	P	
	↓	E 6130	↓	↓			↓	↓	↓				

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SUMMARY SHEET
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PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-184	10/23	N 583890	L-8	N	96.4	23.5	SF-2	97.0	23.0	99.4	+0.5	P	
		E 1506140											
SF-185		N 3770			95.4	23.9				98.4	+0.9	P	
		E 6180											
SF-186		N 3630			96.9	25.4				99.9	+2.4	P	
		E 6220											
SF-187		N 3520			95.5	26.0				98.5	+3.0	P	
		E 6180											
SF-188		N 3420			95.4	24.4				98.4	+1.4	P	
		E 6150											
SF-189		N 3330			93.9	25.6				96.8	+2.6	P	
		E 6120											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
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COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-190	11/1	N 583730	L-3	N	93.0	27.2	SF-4	96.5	24.9	96.4	+2.3	P	
		E 1506130											
SF-191		N 3640			93.4	27.0				96.8	+2.1	P	
		E 6130											
SF-192		N 3480			91.9	28.4				95.2	+3.5	P	
		E 6130											
SF-193		N 3350			92.7	26.9				96.1	+2.0	P	
		E 6050											
SF-194		N 3460			92.7	27.7				96.0	+2.8	P	
		E 6050											
SF-195		N 3540			92.0	27.5				95.3	+2.6	P	
		E 6050											
SF-196		N 3620			92.8	25.8				96.2	+0.9	P	
		E 6050											
SF-197		N 3750			92.5	25.8				95.9	+0.9	P	
		E 6050											
SF-198		N 3850			96.1	24.3				99.6	-0.6	P	
		E 6050											
SF-199		N 3950			92.7	26.7				96.1	+1.8	P	
		E 5970											
SF-200		N 3750			95.4	25.7				98.9	+0.8	P	
		E 5950											
SF-201		N 3650			93.5	24.7				96.9	-0.2	P	
	↓	E 5950	↓	↓			↓	↓	↓				

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SUMMARY SHEET
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PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-202	11/1	N 583570	L-3	N	94.6	23.1	SF-4	96.5	24.9	98.0	-1.8	P	
		E 1505950											
SF-203		N 3540			92.3	27.6				95.6	+2.7	P	
		E 5850											
SF-204		N 3640			92.3	25.3				95.6	+0.4	P	
		E 5850											
SF-205		N 3740			94.8	25.9				98.2	+1.0	P	
		E 5860											
SF-206		N 3850			92.8	24.7				96.2	-0.2	P	
		E 5860											
SF-207		N 3450			95.1	25.3				98.5	+0.4	P	
		E 5750											
SF-208		N 3540			93.4	25.1				96.8	+0.2	P	
		E 5740											
SF-209		N 3640			93.1	26.8				96.5	+1.9	P	
		E 5730											
SF-210		N 3730			94.9	24.9				98.3	Ø	P	
		E 5730											
SF-211		N 3830			92.5	24.6				95.9	-0.3	P	
	↓	E 5750	↓	↓			↓	↓	↓				
		N											
		E											
		N											
		E											

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SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-212	11/2	N 583440	L-3	N	92.9	27.7	SF-4	96.5	24.9	96.3	+2.8	P	
		E 1505650											
SF-213		N 3560			92.0	26.5				95.3	+1.6	P	
		E 5660											
SF-214		N 3630			92.7	28.3				96.1	+3.4	P	
		E 5640											
SF-215		N 3750			92.8	25.5				96.2	+0.6	P	
		E 5670											
SF-216		N 3820			92.3	27.1				95.6	+2.2	P	
		E 5630											
SF-217		N 3810			94.5	25.4				97.9	+0.5	P	
		E 5520											
SF-218		N 3750			93.9	25.3				97.3	+0.4	P	
		E 5550											
SF-219		N 3680			95.7	24.7				99.2	-0.2	P	
		E 5550											
SF-220		N 3550			93.7	26.1				97.1	+1.2	P	
		E 5540											
SF-221		N 3450			92.1	25.9				95.4	+1.0	P	
		E 5550											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-222	11/3	N 583540	L-3	N	92.3	26.5	SF-4	96.5	24.9	95.6	+1.6	P	
		E 1505450											
SF-223		N 3620			96.0	25.5				99.5	+0.6	P	
		E 5430											
SF-224		N 3730			92.6	28.4				95.9	+3.5	P	
		E 5470											
SF-225		N 3750			95.7	25.3				99.2	+0.4	P	
		E 5350											
SF-226		N 3640			94.7	26.0				98.1	+1.1	P	
		E 5350											
SF-227		N 3530			94.0	25.4				97.4	+0.5	P	
		E 5350											
SF-228		N 3530			92.9	27.2				96.3	+2.3	P	
		E 5230											
SF-229		N 3630			93.4	28.9				96.8	+4.0	P	
		E 5250											
SF-230		N 3740			94.1	27.6				97.5	+2.7	P	
		E 5250											
SF-231		N 3720			95.0	26.1				98.4	+1.2	P	
		E 5140											
SF-232		N 3630			94.3	26.0				97.7	+1.1	P	
		E 5130											
SF-233		N 3540			94.4	27.5				97.8	+2.6	P	
		E 5150											

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IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 11/4/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-234	11/3	N 583450	L-3	N	93.1	26.3	SF-4	96.5	24.9	96.5	+1.4	P	
		E 1505150											
SF-235		N 3480			91.8	28.5				95.1	+3.6	P	
		E 5070											
SF-236		N 3750	L-4		93.2	25.9				96.6	+1.0	P	
		E 5120											
SF-237		N 3610			94.4	25.6				97.8	+0.7	P	
		E 5090											
SF-238		N 3520			94.4	27.5				97.8	+2.6	P	
		E 5070											
SF-239		N 3410			94.9	25.4				98.3	+0.5	P	
		E 5050											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
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SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-240	11/8	N 583340	L-2	N	93.8	25.9	SF-4	96.5	24.9	97.2	+1.0	P	
		E 1505150											
SF-241		N 3330			92.3	26.7				95.6	+1.8	P	
		E 5040											
SF-242		N 3240			94.2	26.0				97.6	+1.1	P	
		E 5060											
SF-243		N 3170			94.1	27.9				97.5	+3.0	P	
		E 5080											
SF-244		N 3160			93.8	26.5				97.2	+1.6	P	
		E 4920											
SF-245		N 3230			93.2	25.9				96.6	+1.0	P	
		E 4960											
SF-246		N 3340	L-3		96.0	25.4				99.5	+0.5	P	
		E 5150											
SF-247		N 3320			94.9	26.1				98.3	+1.2	P	
		E 5040											
SF-248		N 3230			94.8	26.7				98.2	+1.8	P	
		E 4970											
SF-249		N 3230			96.1	25.8				99.6	+0.9	P	
		E 5070											
SF-250		N 3150			93.9	26.0				97.3	+1.1	P	
		E 4920											
SF-251		N 3170			93.0	26.1				96.4	+1.2	P	
		E 5020											

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SF-252	11/8	N 583170	L-3	N	94.6	26.3	SF-4	96.5	24.9	98.0	+1.4	P	
		E 1505120											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
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REVIEWED BY: [illegible]

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SF-253	11/9	N 583560	L-4	N	94.5	25.3	SF-4	96.5	24.9	97.9	+0.4	P	
		E 1505610											
SF-254		N 3490			93.6	27.1				96.9	+2.2	P	
		E 5660											
SF-255		N 3430			93.8	26.6				97.2	+1.7	P	
		E 5710											
SF-256		N 3350			95.3	26.0				98.8	+1.1	P	
		E 5760											
SF-257		N 3270			95.4	25.3				98.9	+0.4	P	
		E 5670											
SF-258		N 3340			94.8	26.1				98.2	+1.2	P	
		E 5650											
SF-259		N 3350			93.7	24.9				97.1	Ø	P	
		E 5550											
SF-260		N 3440			95.8	25.4				99.3	+0.5	P	
		E 5550											
SF-261		N 3560			96.0	25.5				99.5	+0.6	P	
		E 5540											
SF-262		N 3560			93.8	26.1				97.2	+1.2	P	
		E 5430											
SF-263		N 3440			95.7	25.3				99.2	+0.4	P	
		E 5470											
SF-264		N 3330			94.1	25.0				97.5	+0.1	P	
		E 5420											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-265	11/9	N 583240	L-4	N	95.3	26.7	SF-4	96.5	24.9	98.8	+1.8	P	
		E 1505420											
SF-266		N 3260			94.6	25.3				98.0	+0.4	P	
		E 5550											
SF-267		N 3540			92.8	27.3				96.2	+2.4	P	
		E 5380											
SF-268		N 3440			94.5	26.5				97.9	+1.6	P	
		E 5350											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-269	11/11	N 583750	L-5	N	81.8	38.4	SF-1	82.3	33.1	99.4	+5.3	P	
		E 1505120											
SF-270		N 3660			87.3	33.4	PC-2	88.7	32.4	98.4	+1.0	P	
		E 5110											
SF-271		N 3540			81.7	31.1	SF-1	82.3	33.1	99.3	-2.0	P	
		E 5070											
SF-272		N 3430			91.7	32.9	SF-4	96.5	24.9	95.0	+8.0	P	
		E 5050											
SF-273		N 3570			94.2	26.0				97.6	+1.1	P	
		E 5380											
SF-274		N 3460			95.8	25.1				99.3	+0.2	P	
		E 5460											
SF-275		N 3430			93.5	25.5				96.9	+0.6	P	
		E 5340											
SF-276		N 3320			93.9	27.9				97.3	+3.0	P	
		E 5420											
SF-277		N 3350			94.9	26.7				98.3	+1.8	P	
		E 5550											
SF-278		N 3270			94.8	26.2				98.2	+1.3	P	
		E 5640											
SF-279		N 3260			94.1	25.4				97.5	+0.5	P	
		E 5550											
SF-280		N 3240			91.9	28.8				95.2	+3.9	P	
		E 5430											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-281	11/11	N 583530	L-5	N	93.4	27.1	SF-4	96.5	24.9	96.8	+2.2	P	
		E 1505440											
SF-282		N 3430			92.1	27.3				95.4	+2.4	P	
		E 5540											
SF-283		N 3330			95.2	26.1				98.7	+1.2	P	
		E 5630											
		N											
		E											
		N											
		E											
		N											
		E											
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N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-284	11/12	N 583710	L-6	N	94.2	25.3	SF-4	96.5	24.9	97.6	+0.4	P	
		E 1505120											
SF-285		N 3610			94.9	25.1				98.3	+0.2	P	
		E 5090											
SF-286		N 3510			93.5	26.3				96.9	+1.4	P	
		E 5070											
SF-287		N 3750	L-7		94.6	26.7				98.0	+1.8	P	
		E 5120											
SF-288		N 3580			94.3	25.4				97.7	+0.5	P	
		E 5080											
SF-289		N 3550	L-8		93.1	26.6				96.5	+1.7	P	
		E 5080											
SF-290		N 3680			94.4	26.1				97.8	+1.2	P	
		E 5110											
SF-291		N 3750	L-9		94.1	26.3				97.5	+1.4	P	
		E 5120											
SF-292		N 3610			94.7	25.4				98.1	+0.5	P	
		E 5090											
SF-293		N 3740	L-10		94.4	27.7				97.8	+2.8	P	
		E 5130	L-4										
SF-294		N 3350			94.4	25.7				97.8	+0.8	P	
		E 5040											
SF-295		N 3280			94.2	26.6				97.6	+1.7	P	
		E 5020											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
SF-296	11/12	N 583230	L-4	N	94.6	25.0	SF-4	96.5	24.9	98.0	+0.1	P	
	↓	E 1504950	↓	↓			↓	↓	↓				
SF-297	↓	N 3140	↓	↓	94.4	25.1	↓	↓	↓	97.8	+0.2	P	
	↓	E 4860	↓	↓			↓	↓	↓				
		N											
		E											
		N											
		E											
		N											
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		N											
		E											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX F

Preconstruction Testing

of NORTH CAROLINA, PLLC

SECTION F-1

Laboratory Bulk Sample Test Results

TIMELY ENGINEERING SOIL TESTS, LLC
374 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: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 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
9803	PC-1	CH	25.0	100.0	70.4	59.2	61	18	43	25.1	98.3	28.1	95.9	5.6E-08
9804	PC-2	CH	27.8	99.9	85.7	66.7	73	28	45	32.4	88.7	35.7	86.7	6.5E-08
9805	PC-3	CH	23.6	100.0	78.7	61.8	65	26	39	27.3	94.4	30.7	92.2	7.6E-08
9806	PC-4	CH	21.8	99.9	69.7	54.4	60	25	35	25.3	98.5	28.7	96.0	4.2E-08
10440	PC-5	MH	34.6	100.0	87.8	64.5	72	35	37	32.2	85.5	-	-	-
10441	PC-6	MH	38.1	100.0	87.8	66.9	71	38	33	34.8	84.8	-	-	-
10528	PC-7	MH	36.2	100.0	86.8	64.9	69	37	32	35.5	85.2	-	-	-
10528A	PC-7	-	-	-	-	-	-	-	-	-	-	38.9	85.1	7.9E-08
10529	PC-8	CH	31.5	100.0	84.3	67.3	61	28	33	32.0	89.7	-	-	-
10529A	PC-8	-	-	-	-	-	-	-	-	-	-	35.5	89.5	6.4E-08

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP® AASHTO R18

Tested By	RI
Date	0 0
Checked By	LM

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9803/ PC-1	Depth/Elev.	EL-600.3'
Location	N582505.5' E1505883.3'	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	478.80
Mass of Dry Sample & Tare, g	414.00
Mass of Tare, g	155.10
Moisture Content, %	25.0

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	307.60
Mass of Dry Sample & Tare, g	275.80
Mass of Tare, g	94.10
Moisture Content, %	17.5

Mass of Total Sample before separation on #4 sieve & Tare, g	676.80
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	575.99

Mass of Sample used for hydrometer analysis, g	70.78
Dry Mass, g	60.24
% of Total Sample passing #4 sieve	100.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"			0.0	100.0
.375"			0.0	100.0
#4	COARSE SAND	0.00	0.0	100.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.21	99.7
#20		1.14	98.1
#40	FINE SAND	3.12	94.8
#60		6.94	88.5
#100		12.51	79.2
#200	FINES	17.86	70.4

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	13:00

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	4.8
% COARSE GRAVEL	0.0	% FINE SAND	24.5
% FINE GRAVEL	0.0	% FINES	70.4
% COARSE SAND	0.3	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	59.2	% CLAY(<0.002mm)	55.9

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
08/23/10	13:02	2	44.5	29.5	0.01199	5.0	39.5	9.8	0.99	0.0266	64.9
08/23/10	13:05	5	43.5	29.5	0.01199	5.0	38.5	10.0	0.99	0.0169	63.3
08/23/10	13:15	15	43.0	29.5	0.01199	5.0	38.0	10.1	0.99	0.0098	62.5
08/23/10	13:30	30	41.5	29.5	0.01199	5.0	36.5	10.3	0.99	0.0070	60.0
08/23/10	14:00	60	41.0	29.5	0.01199	5.0	36.0	10.4	0.99	0.0050	59.2
08/23/10	17:10	250	39.5	29.5	0.01199	5.0	34.5	10.7	0.99	0.0025	56.7
08/24/10	13:00	1440	38.0	29.5	0.01199	5.0	33.0	10.9	0.99	0.0010	

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

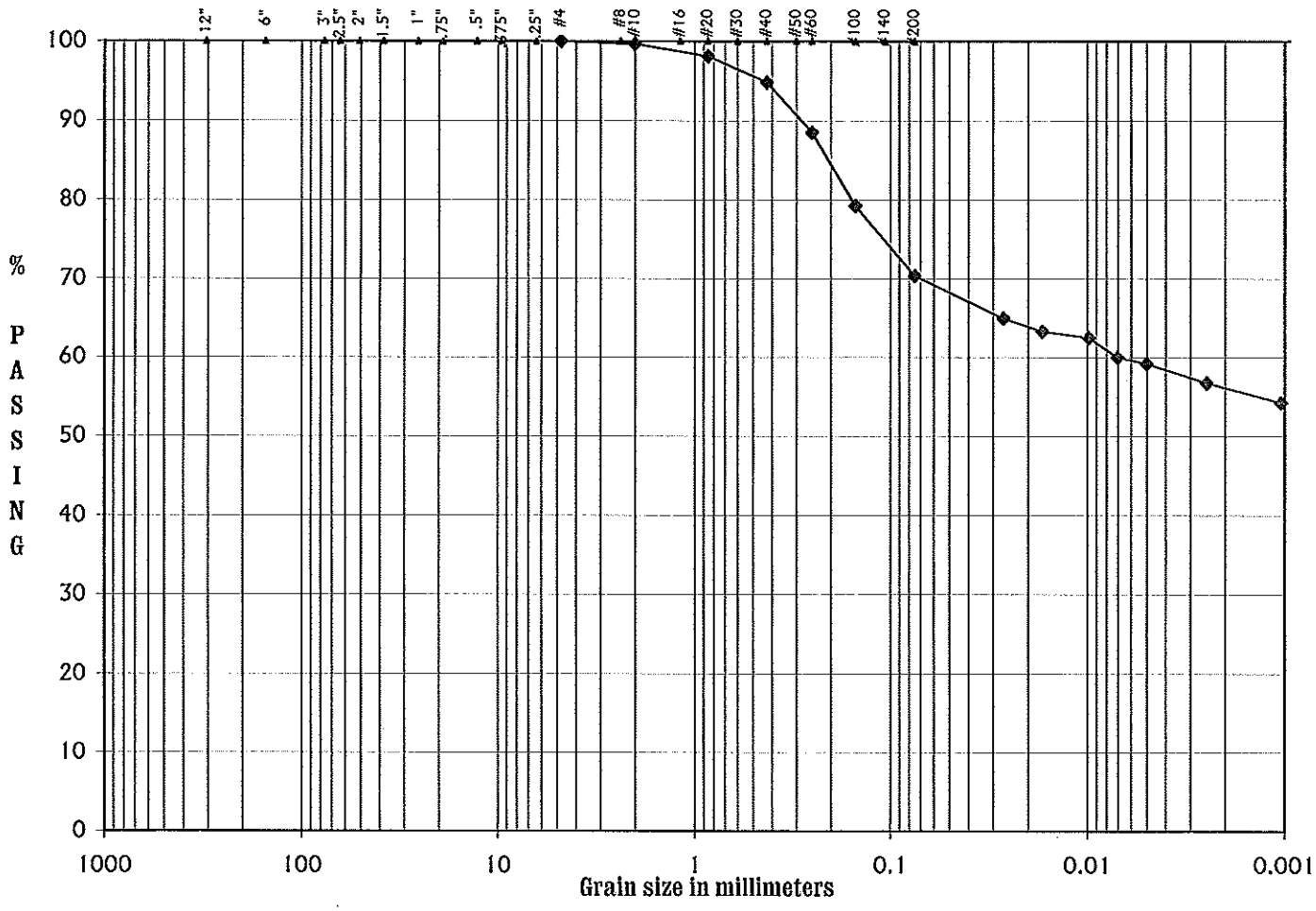
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AASHTO R18	Tested By: RI Date: 08/23/10 Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9803/ PC-1	Depth/Elev.	EL-600.3'
Location	N582505.5' E1505883.3'	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel		Sand			Fines
		Coarse	Fine	Coarse	Medium	Fine	Silt or Clay

DESCRIPTION: Red Fat Clay with Sand

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

USCS (ASTM D2487; D2488): CH

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO R18

Tested By	NK
Date	08/25/10
Checked By	VB

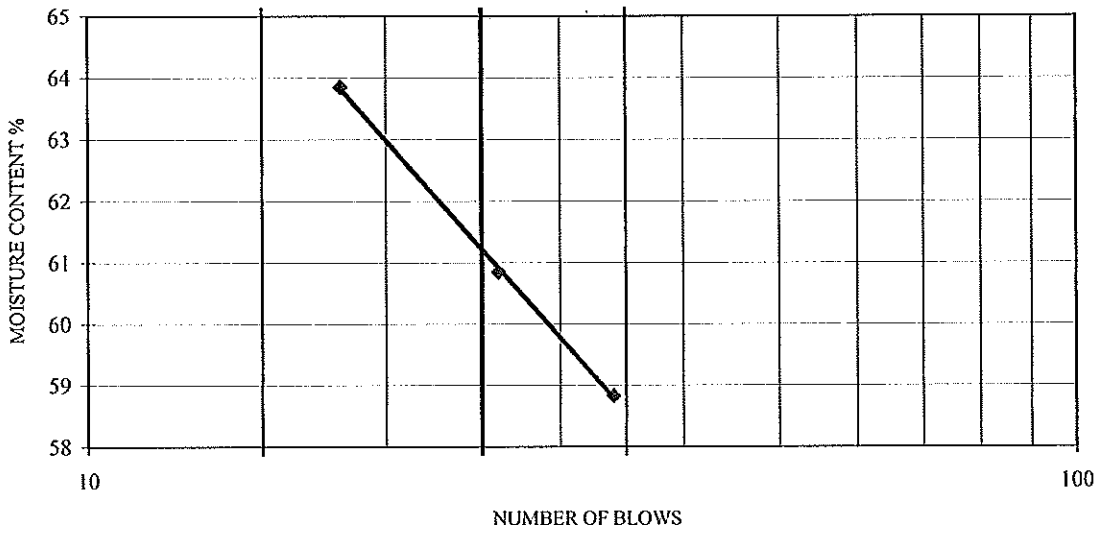
Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9803/ PC-1	Depth/Elev.	EL-600.3'
Location	N582505.5' E1505883.3'	Add. Info	-

ASTM D 4318/AASHTO T 88, T 89
Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	34	26	18
Mass of Wet Sample & Tare, g	39.74	38.83	40.03
Mass of Dry Sample & Tare, g	35.64	34.06	34.29
Mass of Tare, g	28.67	26.22	25.30
Moisture Content, %	58.82	60.84	63.85

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	28.69	30.39
Mass of Dry Sample & Tare, g	27.50	28.91
Mass of Tare, g	20.76	20.60
Moisture Content, %	17.66	17.81

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	478.8
Mass of Dry Sample & Tare, g	414.0
Mass of Tare, g	155.1
Moisture Content, %	25.03

LIQUID LIMIT (LL)	61
PLASTIC LIMIT (PL)	18
PLASTICITY INDEX (PI)	43
LIQUIDITY INDEX (LI)	0.16

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487; D2488): CH

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	RI/KI
Date	08/17/10
Checked By	UB

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9803/ PC-1	Depth/Elev.	EL-600.3'
Location	N582505.5' E1505883.3'	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	12800.0	10237.6
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

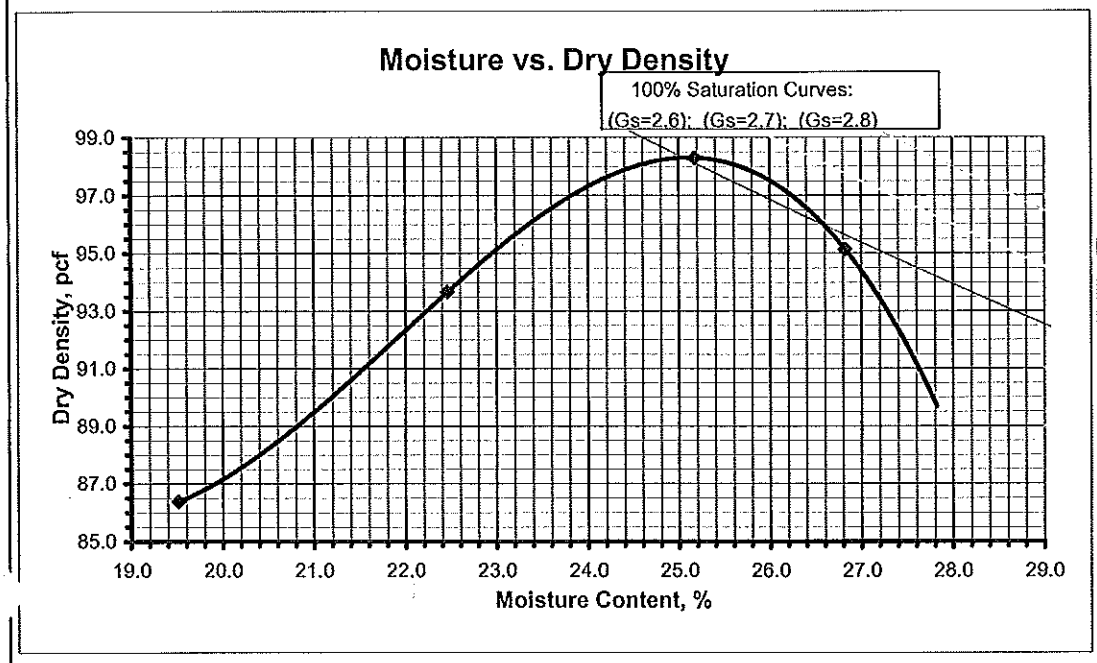
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	478.8	
Mass of Dry Sample & Tare, g	414.0	
Mass of Tare, g	155.1	
Moisture Content, %	25.0	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5810.0	5983.0	6109.0	6073.0	
Mass of Wet Sample & Tare, g	443.0	482.5	449.0	431.5	
Mass of Dry Sample & Tare, g	387.4	410.6	378.0	356.2	
Mass of Tare, g	102.5	90.5	96.0	75.5	
Moisture Content, %	19.5	22.5	25.2	26.8	
Wet Density, pcf	103.2	114.7	123.0	120.7	
Dry Density, pcf	86.4	93.7	98.3	95.1	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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
Red Fat Clay with Sand

USCS (ASTM D2487; D2488): CH

Maximum Dry Density, pcf	98.3	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	25.1	**Corrected Optimum Moisture Content, %**	NA

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO R18

Tested By	RI/KI
Date	08/22/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9803/ PC-1	Depth/Elev.	EL-600.3'
Location	N582505.5' E1505883.3'	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	2.579	in	6.55	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.61	cm^3	0.0095	ft^3
Mass	531.00	g	1.17	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	95.9	pcf		

Moisture Content

Mass of wet sample & tare	202.70	g
Mass of dry sample & tare	175.10	g
Mass of tare	77.00	g
% Moisture	28.1	

Test Data

Speed	12	
Board Number	1	
Cell Number	12	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	131.54	cm
Min Head	130.83	cm
Maximum Gradient	20.03	
Minimum Gradient	19.92	

Final Data (After Test)

Average Height of Sample			2.586	in	6.57	cm
Average Diameter of Sample			2.871	in	7.29	cm
Area	6.47	in^2	41.77	cm^2		
Volume	274.28	cm^3	0.0097	ft^3		
Mass	536.10	g	1.18	lb		

Dry Density	94.5	pcf
Vol. of Voids	120.36	cm^3
Vol. of Solids	153.93	cm^3
Void Ratio	0.78	
Saturation	100.1	%

Moisture Content

Mass of wet sample & tare	841.60	g
Mass of dry sample & tare	721.10	g
Mass of tare	305.50	g
% Moisture	29.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
08/22/10	10	50	-	1.87	131.54	20.03	28.2	-	-	-	
08/22/10	11	0	600	1.86	130.83	19.92	28.2	6.71E-08	0.828	5.56E-08	
08/22/10	11	10	600	1.86	130.83	19.92	28.2	6.73E-08	0.828	5.57E-08	
08/22/10	11	20	600	1.86	130.83	19.92	28.2	6.73E-08	0.828	5.57E-08	*
08/22/10	11	30	600	1.87	131.54	20.03	28.2	6.71E-08	0.828	5.56E-08	*
08/22/10	11	40	600	1.87	131.54	20.03	28.2	6.69E-08	0.828	5.54E-08	*
08/22/10	11	50	600	1.86	130.83	19.92	28.2	6.71E-08	0.828	5.56E-08	*

Reported Average Hydraulic Conductivity* 5.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487:2488): CH

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 97.6% of maximum dry density (standard proctor) at 3.0% above optimum moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: RI Date: 08/23/10 Checked By: CB

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9804/ PC-2	Depth/Elev.	El-584.0'
Location	N 582971.6' E 1505780.3'	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	570.20
Mass of Dry Sample & Tare, g	481.00
Mass of Tare, g	159.90
Moisture Content, %	27.8

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	365.20
Mass of Dry Sample & Tare, g	311.90
Mass of Tare, g	91.20
Moisture Content, %	24.2

Mass of Total Sample before separation on #4 sieve & Tare, g	701.10
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	564.72

Mass of Sample used for hydrometer analysis, g	70.24
Dry Mass, g	56.58
% of Total Sample passing #4 sieve	99.9

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

ve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"			0.0	100.0
2.5"	COARSE		0.0	100.0
2"	GRAVEL		0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"			0.0	100.0
.5"	FINE GRAVEL		0.0	100.0
.375"		0.00	0.0	100.0
#4	COARSE SAND	0.62	0.1	99.9

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM	0.11	99.7
#20	SAND	0.79	98.5
#40		1.76	96.8
#60	FINE SAND	3.50	93.7
#100		5.34	90.5
#200	FINES	8.01	85.7

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	13:02

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	2.9
% COARSE GRAVEL	0.0	% FINE SAND	11.0
% FINE GRAVEL	0.1	% FINES	85.7
% COARSE SAND	0.2	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	66.7	% CLAY(<0.002mm)	55.8

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
08/23/10	13:04	2	52.0	29.5	0.01199	5.0	47.0	8.6	0.99	0.0248	82.2
08/23/10	13:07	5	50.5	29.5	0.01199	5.0	45.5	8.8	0.99	0.0159	79.5
08/23/10	13:17	15	47.0	29.5	0.01199	5.0	42.0	9.4	0.99	0.0095	73.4
08/23/10	13:32	30	45.0	29.5	0.01199	5.0	40.0	9.7	0.99	0.0068	69.9
08/23/10	14:02	60	43.0	29.5	0.01199	5.0	38.0	10.1	0.99	0.0049	66.4
08/23/10	17:12	250	38.5	29.5	0.01199	5.0	33.5	10.8	0.99	0.0025	58.6
08/24/10	13:02	1440	34.0	29.5	0.01199	5.0	29.0	11.6	0.99	0.0011	50.7

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

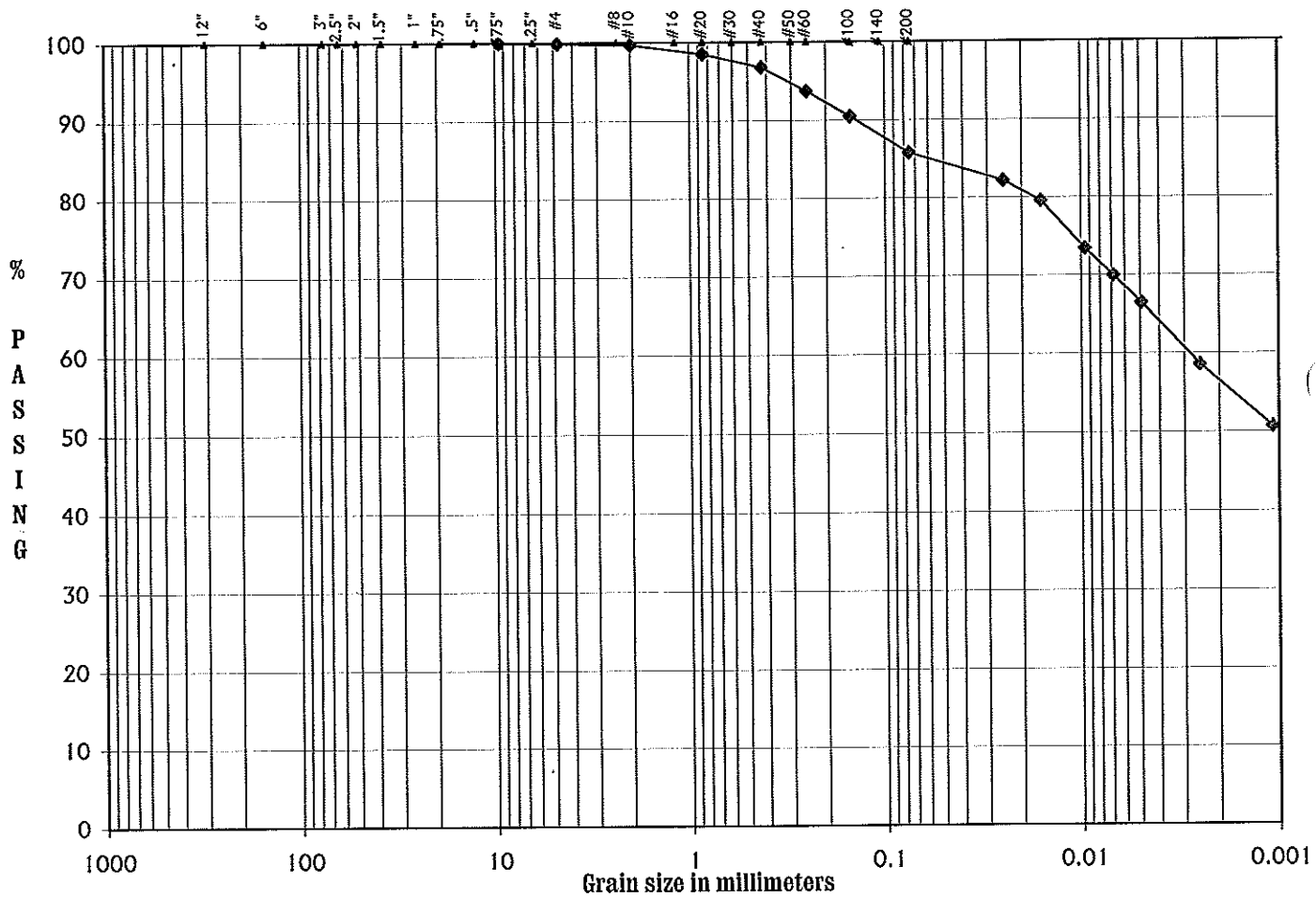
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: RI Date: 08/ Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9804/ PC-2	Depth/Elev.	El-584.0'
Location	N 582971.6' E 1505780.3'	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Fat Clay

USCS (ASTM D2487; D2488): CH

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		Date	08/25/10
		Checked By	VS

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9804/ PC-2	Depth/Elev.	El-584.0'
Location	N 582971.6' E 1505780.3'	Add. Info	-

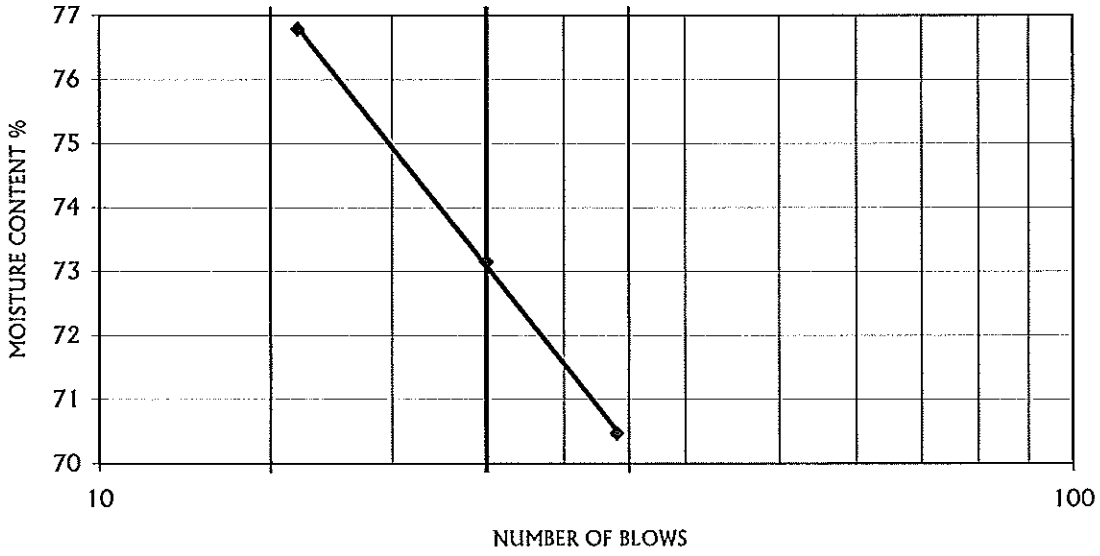
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	34	25	16
Mass of Wet Sample & Tare, g	36.63	40.50	33.09
Mass of Dry Sample & Tare, g	31.81	34.18	28.89
Mass of Tare, g	24.97	25.54	23.42
Moisture Content, %	70.47	73.15	76.78

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	27.80	28.89
Mass of Dry Sample & Tare, g	25.86	27.18
Mass of Tare, g	18.90	21.07
Moisture Content, %	27.87	27.99

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	666.10
Mass of Dry Sample & Tare, g	526.50
Mass of Tare, g	150.70
Moisture Content, %	37.15

LIQUID LIMIT (LL)	73
PLASTIC LIMIT (PL)	28
PLASTICITY INDEX (PI)	45
LIQUIDITY INDEX (LI)	0.20

DESCRIPTION: Red Fat Clay

USCS (ASTM D2487; D2488): CH

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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AASHTO R18

Tested By	KI
Date	08/17/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9804/ PC-2	Depth/Elev.	El-584.0'
Location	N 582971.6' E 1505780.3'	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	11900.0	9312.9
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

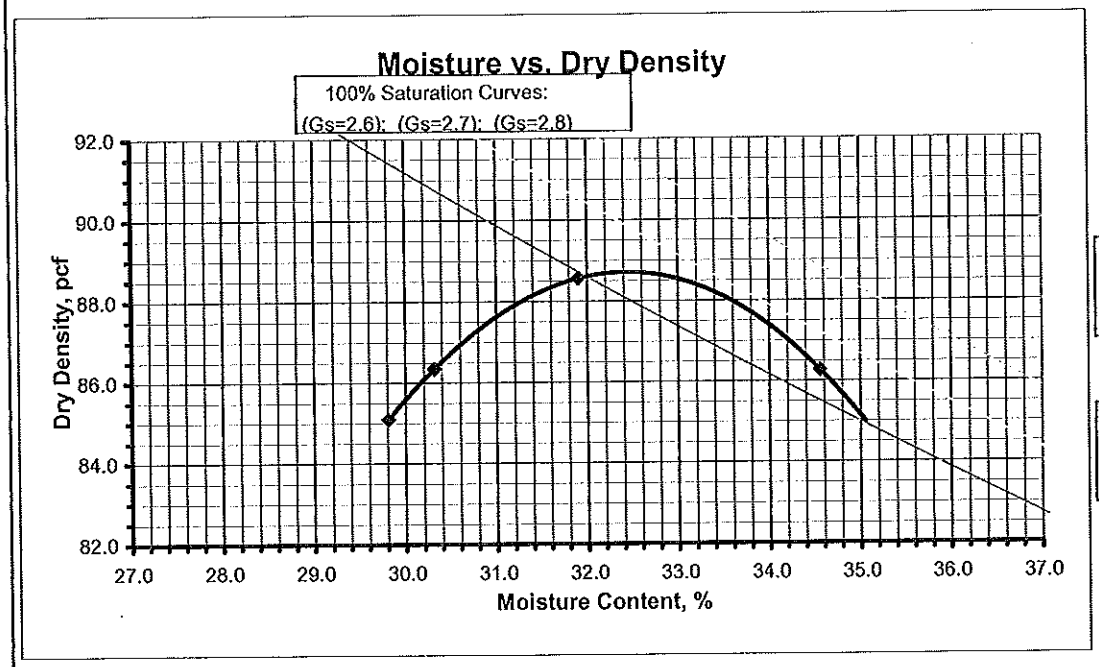
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	570.2	
Mass of Dry Sample & Tare, g	481.0	
Mass of Tare, g	159.9	
Moisture Content, %	27.8	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5919.0	5950.0	6015.0	6004.0	
Mass of Wet Sample & Tare, g	441.5	435.0	490.5	576.5	
Mass of Dry Sample & Tare, g	363.3	352.3	398.1	481.6	
Mass of Tare, g	101.0	79.5	108.5	207.0	
Moisture Content, %	29.8	30.3	31.9	34.6	
Wet Density, pcf	110.5	112.5	116.8	116.1	
Dry Density, pcf	85.1	86.3	88.6	86.3	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.03[illegible]
Hammer ID Number	31[illegible]
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
Red Fat Clay

USCS (ASTM D2487; D2488)
CH

Maximum Dry Density, pcf	88.7	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	32.4	**Corrected Optimum Moisture Content, %**	NA

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Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	RI/KI
Date	08/22/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9804/ PC-2	Depth/Elev.	El-584.0'
Location	N 582971.6' E 1505780.3'	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	2.575	in	6.54	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.19	cm^3	0.0095	ft^3
Mass	507.40	g	1.12	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	86.7	pcf		

Moisture Content

Mass of wet sample & tare	222.80	g
Mass of dry sample & tare	182.30	g
Mass of tare	68.70	g
% Moisture	35.7	

Test Data

Speed	12	
Board Number	2	
Cell Number	18	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	113.25	cm
Min Head	111.84	cm
Maximum Gradient	17.18	
Minimum Gradient	16.97	

Final Data (After Test)

Average Height of Sample	2.595	in	6.59	cm
Average Diameter of Sample	2.871	in	7.29	cm
Area	6.47 in^2		41.77	cm^2
Volume	275.29	cm^3	0.0097	ft^3
Mass	515.40	g	1.14	lb

Dry Density	85.2	pcf
Vol. of Voids	136.11	cm^3
Vol. of Solids	139.19	cm^3
Void Ratio	0.98	
Saturation	102.6	%

Moisture Content

Mass of wet sample & tare	666.10	g
Mass of dry sample & tare	526.50	g
Mass of tare	150.70	g
% Moisture	37.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
08/22/10	10	50	-	1.61	113.25	17.18	28.2	-	-	-	
08/22/10	11	0	600	1.61	113.25	17.18	28.2	7.80E-08	0.828	6.46E-08	
08/22/10	11	10	600	1.61	113.25	17.18	28.2	7.80E-08	0.828	6.46E-08	
08/22/10	11	20	600	1.59	111.84	16.97	28.2	7.85E-08	0.828	6.50E-08	*
08/22/10	11	30	600	1.61	113.25	17.18	28.2	7.85E-08	0.828	6.50E-08	*
08/22/10	11	40	600	1.61	113.25	17.18	28.2	7.80E-08	0.828	6.46E-08	*
08/22/10	11	50	600	1.60	112.54	17.07	28.2	7.83E-08	0.828	6.48E-08	*

Reported Average Hydraulic Conductivity* 6.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION	USCS (ASTM D2487;2488)
Red Fat Clay	CH

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 97.8% of maximum dry density (standard proctor) at 3.3% above optimum moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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AAP AASHTO P18

Tested By	RI
Date	08/[illegible]/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9805/ PC-3	Depth/Elev.	EL-599.2'
Location	N 582668.1' E 1505881.6'	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	573.20
Mass of Dry Sample & Tare, g	493.70
Mass of Tare, g	156.20
Moisture Content, %	23.6

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	359.70
Mass of Dry Sample & Tare, g	319.50
Mass of Tare, g	100.50
Moisture Content, %	18.4

Mass of Total Sample before separation on #4 sieve & Tare, g	632.60
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	534.49

Mass of Sample used for hydrometer analysis, g	70.33
Dry Mass, g	59.42
% of Total Sample passing #4 sieve	100.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"			0.0	100.0
.375"			0.0	100.0
#4	COARSE SAND	0.00	0.0	100.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.41	99.3
#20		1.16	98.0
#40	FINE SAND	2.65	95.5
#60		5.10	91.4
#100		8.70	85.4
#200	FINES	12.67	78.7

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	13:04

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	3.8
% COARSE GRAVEL	0.0	% FINE SAND	16.9
% FINE GRAVEL	0.0	% FINES	78.7
% COARSE SAND	0.7	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	61.8	% CLAY(<0.002mm)	53.2

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
08/23/10	13:06	2	49.0	29.5	0.01199	5.0	44.0	9.1	0.99	0.0255	73.3
08/23/10	13:09	5	47.5	29.5	0.01199	5.0	42.5	9.3	0.99	0.0164	70.8
08/23/10	13:19	15	45.5	29.5	0.01199	5.0	40.5	9.7	0.99	0.0096	67.5
08/23/10	13:34	30	43.6	29.5	0.01199	5.0	38.6	10.0	0.99	0.0069	64.3
08/23/10	14:04	60	42.0	29.5	0.01199	5.0	37.0	10.2	0.99	0.0050	61.6
08/23/10	17:14	250	38.0	29.5	0.01199	5.0	33.0	10.9	0.99	0.0025	55.0
08/24/10	13:04	1440	35.0	29.5	0.01199	5.0	30.0	11.4	0.99	0.0011	50.0

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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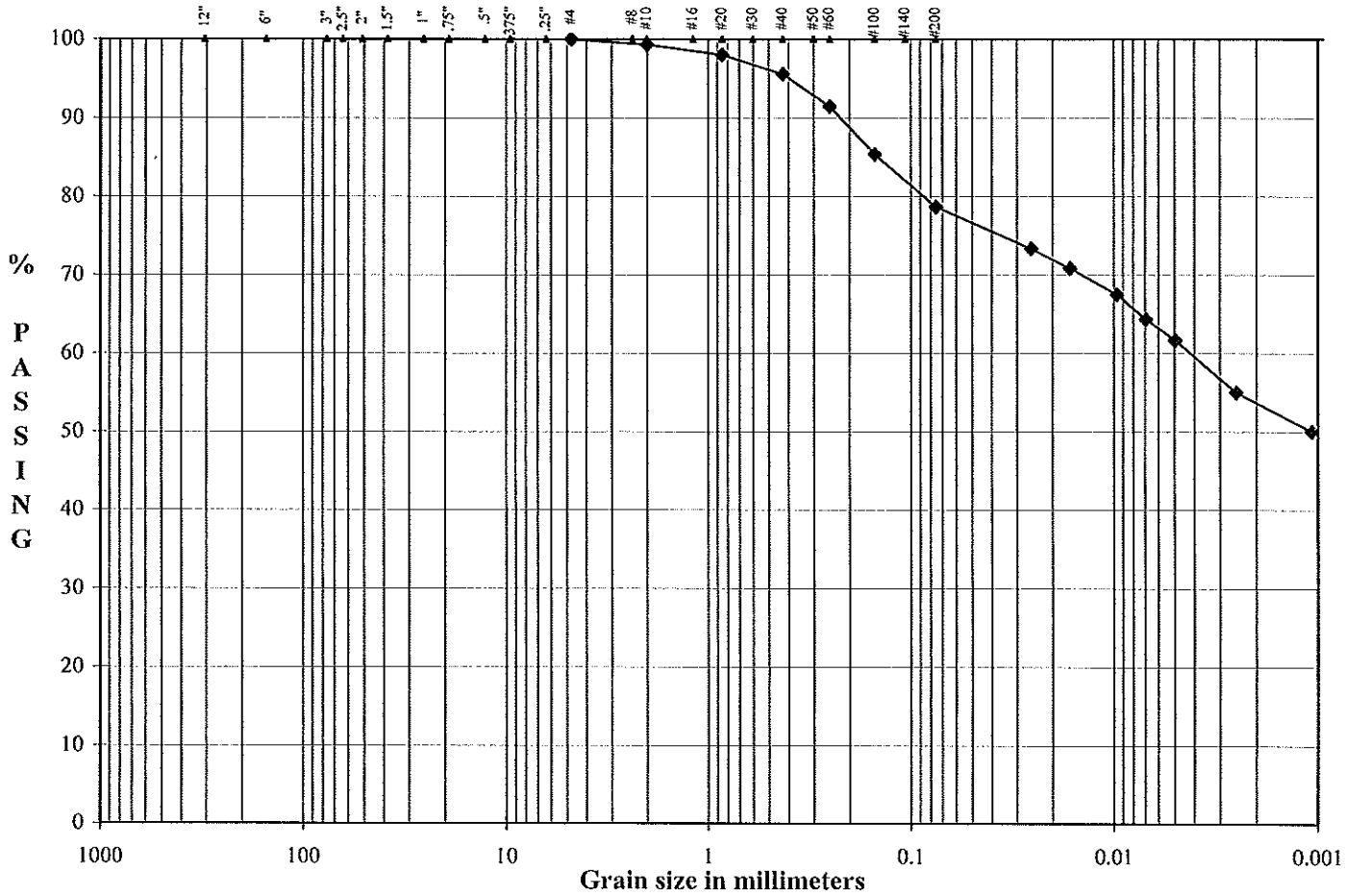
Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9805/ PC-3	Depth/Elev.	EL-599.2'
Location	N 582668.1' E 1505881.6'	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Fat Clay with Sand

SCS (ASTM D2487; D2488): CH

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAR AASHTO R18

Tested By	NK
Date	08/25/10
Checked By	LB

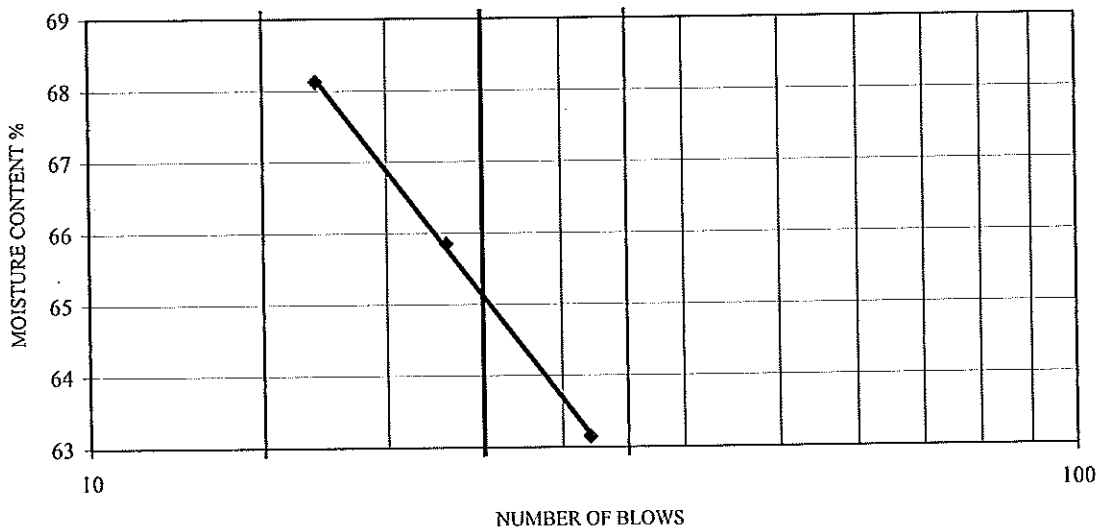
Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9805/ PC-3	Depth/Elev.	EL-599.2'
Location	N 582668.1' E 1505881.6'	Add. Info	-

ASTM D 4318/AASHTO T 88, T 89
Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	32	23	17
Mass of Wet Sample & Tare, g	35.85	37.96	35.63
Mass of Dry Sample & Tare, g	32.08	33.39	30.80
Mass of Tare, g	26.11	26.45	23.71
Moisture Content, %	63.15	65.85	68.12

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	28.91	28.40
Mass of Dry Sample & Tare, g	26.74	26.70
Mass of Tare, g	18.54	20.17
Moisture Content, %	26.46	26.03

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	684.50
Mass of Dry Sample & Tare, g	551.90
Mass of Tare, g	154.00
Moisture Content, %	33.32

LIQUID LIMIT (LL)	65
PLASTIC LIMIT (PL)	26
PLASTICITY INDEX (PI)	39
LIQUIDITY INDEX (LI)	0.19

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487; D2488): CH

AASHTO (M 145): NA

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AAP AASHTO R18

Tested By	KI
Date	08/17/10
Checked By	UB

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9805/ PC-3	Depth/Elev.	EL-599.2'
Location	N 582668.1' E 1505881.6'	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	11900.0	9631.3
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

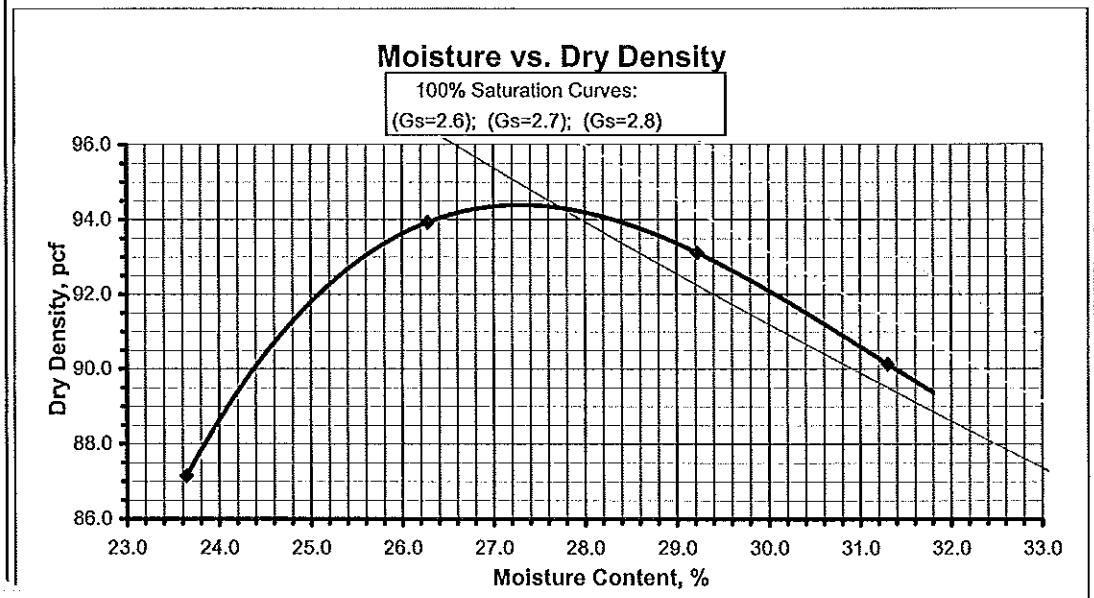
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	573.2	
Mass of Dry Sample & Tare, g	493.7	
Mass of Tare, g	156.2	
Moisture Content, %	23.6	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5878.0	6042.0	6068.0	6038.0	
Mass of Wet Sample & Tare, g	515.5	526.0	498.5	424.5	
Mass of Dry Sample & Tare, g	434.9	438.6	407.7	341.3	
Mass of Tare, g	94.0	106.0	97.0	75.5	
Moisture Content, %	23.6	26.3	29.2	31.3	
Wet Density, pcf	107.7	118.6	120.3	118.3	
Dry Density, pcf	87.1	93.9	93.1	90.1	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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
Red Fat Clay with Sand

USCS (ASTM D2487; D2488)
CH

Maximum Dry Density, pcf	94.4	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	27.3	**Corrected Optimum Moisture Content, %**	NA

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Web: www.test-llc.com

Tested By	RI/KI
Date	08/22/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9805/ PC-3	Depth/Elev.	EL-599.2'
Location	N 582668.1' E 1505881.6'	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	2.574	in	6.54	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.08	cm^3	0.0095	ft^3
Mass	519.70	g	1.15	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	92.2	pcf		

Moisture Content

Mass of wet sample & tare	213.30	g
Mass of dry sample & tare	181.80	g
Mass of tare	79.10	g
% Moisture	30.7	

Test Data

Speed	12	
Board Number	3	
Cell Number	8	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	96.37	cm
Min Head	94.26	cm
Maximum Gradient	14.63	
Minimum Gradient	14.31	

Final Data (After Test)

Average Height of Sample			2.594	in	6.59	cm
Average Diameter of Sample			2.877	in	7.31	cm
Area	6.50	in^2	41.94	cm^2		
Volume	276.34	cm^3	0.0098	ft^3		
Mass	530.60	g	1.17	lb		

Dry Density	89.9	pcf
Vol. of Voids	128.94	cm^3
Vol. of Solids	147.40	cm^3
Void Ratio	0.87	
Saturation	102.9	%

Moisture Content

Mass of wet sample & tare	684.50	g
Mass of dry sample & tare	551.90	g
Mass of tare	154.00	g
% Moisture	33.3	

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	
08/22/10	12	30	-	1.34	94.26	14.31	28.2	-	-	-	
08/22/10	12	40	600	1.35	94.96	14.41	28.2	9.30E-08	0.828	7.70E-08	
08/22/10	12	50	600	1.35	94.96	14.41	28.2	9.26E-08	0.828	7.67E-08	
08/22/10	13	0	600	1.37	96.37	14.63	28.2	9.20E-08	0.828	7.61E-08	*
08/22/10	13	10	600	1.35	94.96	14.41	28.2	9.20E-08	0.828	7.61E-08	*
08/22/10	13	20	600	1.35	94.96	14.41	28.2	9.26E-08	0.828	7.67E-08	*
08/22/10	13	30	600	1.35	94.96	14.41	28.2	9.26E-08	0.828	7.67E-08	*

Reported Average Hydraulic Conductivity* 7.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487;2488): CH

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 97.7% of maximum dry density (standard proctor) at 3.4% above optimum moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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AAP AASHTO R18

Tested By	RI
Date	08/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9806/ PC-4	Depth/Elev.	EL-596.7'
Location	N 582785.4' E1505825.6'	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	670.10
Mass of Dry Sample & Tare, g	578.50
Mass of Tare, g	159.20
Moisture Content, %	21.8

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	350.80
Mass of Dry Sample & Tare, g	313.50
Mass of Tare, g	94.20
Moisture Content, %	17.0

Mass of Total Sample before separation on #4 sieve & Tare, g	651.60
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	556.88

Mass of Sample used for hydrometer analysis, g	70.09
Dry Mass, g	59.90
% of Total Sample passing #4 sieve	99.9

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"			0.0	100.0
2.5"	COARSE		0.0	100.0
2"	GRAVEL		0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"			0.0	100.0
.5"	FINE GRAVEL		0.0	100.0
.375"		0.00	0.0	100.0
#4	COARSE SAND	0.47	0.1	99.9

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM	0.46	99.1
#20	SAND	1.23	97.9
#40		2.45	95.8
#60	FINE SAND	6.36	89.3
#100		12.45	79.1
#200	FINES	18.09	69.7

Remarks

Material passing 3/8" Sieve was used for test

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	13:06

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	3.3
% COARSE GRAVEL	0.0	% FINE SAND	26.1
% FINE GRAVEL	0.1	% FINES	69.7
% COARSE SAND	0.8	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	54.4	% CLAY(<0.002mm)	49.4

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
08/23/10	13:08	2	43.0	29.5	0.01199	5.0	38.0	10.1	0.99	0.0269	62.8
08/23/10	13:11	5	42.5	29.5	0.01199	5.0	37.5	10.2	0.99	0.0171	61.9
08/23/10	13:21	15	41.0	29.5	0.01199	5.0	36.0	10.4	0.99	0.0100	59.4
08/23/10	13:36	30	40.0	29.5	0.01199	5.0	35.0	10.6	0.99	0.0071	57.8
08/23/10	14:06	60	38.0	29.5	0.01199	5.0	33.0	10.9	0.99	0.0051	54.5
08/23/10	17:16	250	36.0	29.5	0.01199	5.0	31.0	11.2	0.99	0.0025	51.2
08/24/10	13:06	1440	33.0	29.5	0.01199	5.0	28.0	11.7	0.99	0.0011	46.2

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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AASHTO R18

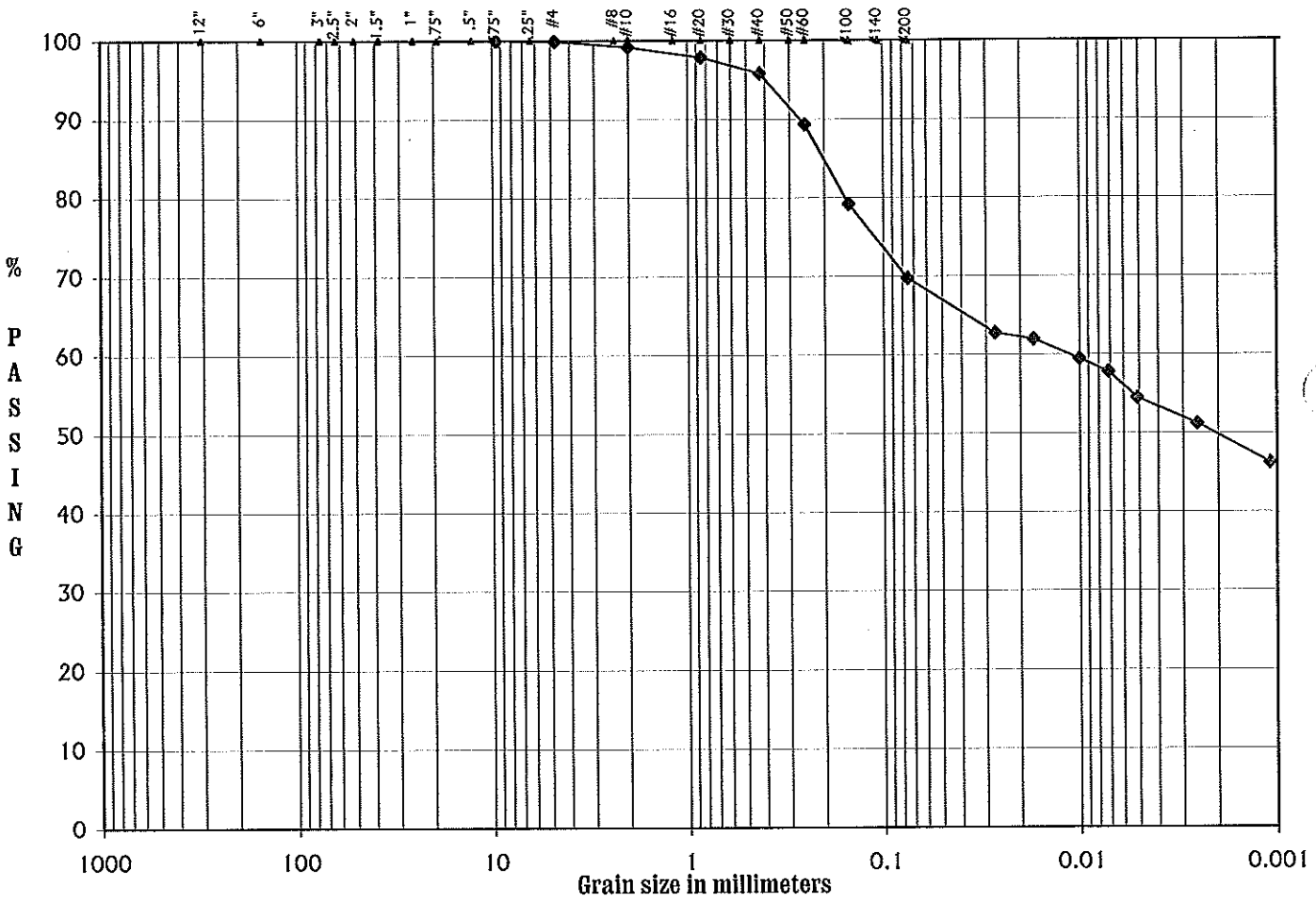
Tested By	RI
Date	08/
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9806/ PC-4	Depth/Elev.	EL-596.7'
Location	N 582785.4' E1505825.6'	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
		Gravel		Sand			Fines

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Sandy Fat Clay

USCS (ASTM D2487; D2488): CH

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AAP AASHTO R18

Tested By	NK
Date	08/25/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9806/ PC-4	Depth/Elev.	EL-596.7'
Location	N 582785.4' E1505825.6'	Add. Info	-

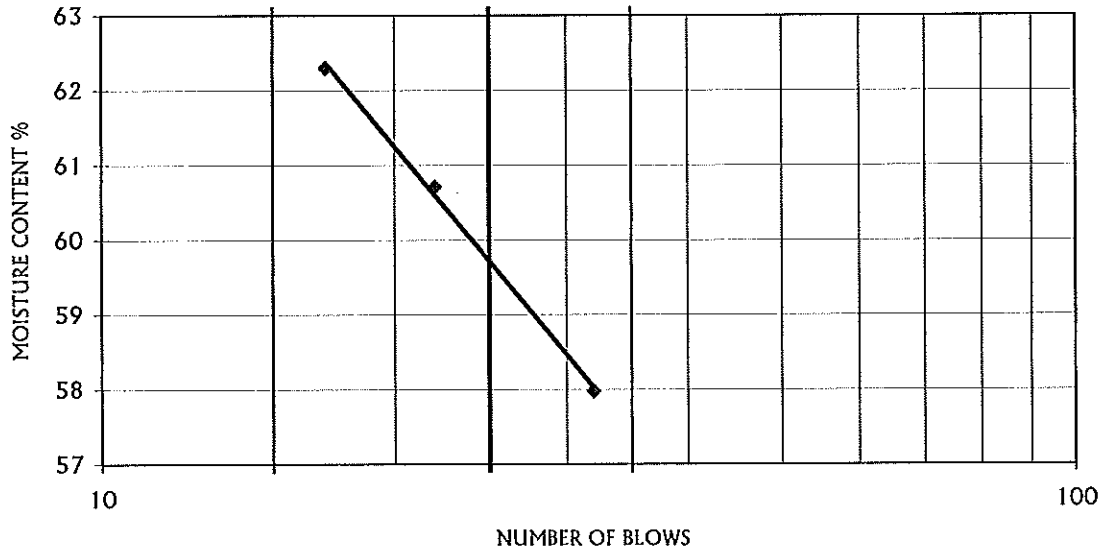
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	32	22	17
Mass of Wet Sample & Tare, g	36.53	38.70	37.85
Mass of Dry Sample & Tare, g	31.66	33.88	32.86
Mass of Tare, g	23.26	25.94	24.85
Moisture Content, %	57.98	60.71	62.30

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	38.08	35.25
Mass of Dry Sample & Tare, g	35.95	33.43
Mass of Tare, g	27.61	26.28
Moisture Content, %	25.54	25.45

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	694.90
Mass of Dry Sample & Tare, g	570.60
Mass of Tare, g	157.80
Moisture Content, %	30.11

LIQUID LIMIT (LL)	60
PLASTIC LIMIT (PL)	25
PLASTICITY INDEX (PI)	35
LIQUIDITY INDEX (LI)	0.15

DESCRIPTION: Red Sandy Fat Clay

USCS (ASTM D2487; D2488): CH

AASHTO (M 145): NA

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AAP AASHTO R18

Tested By	KI
Date	08/17/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9806/ PC-4	Depth/Elev.	EL-596.7'
Location	N 582785.4' E1505825.6'	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	11300.0	9274.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	73.0	73.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	
Material Retained on 3/8" Sieve, %	0.8
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.8

MOISTURE CONTENT

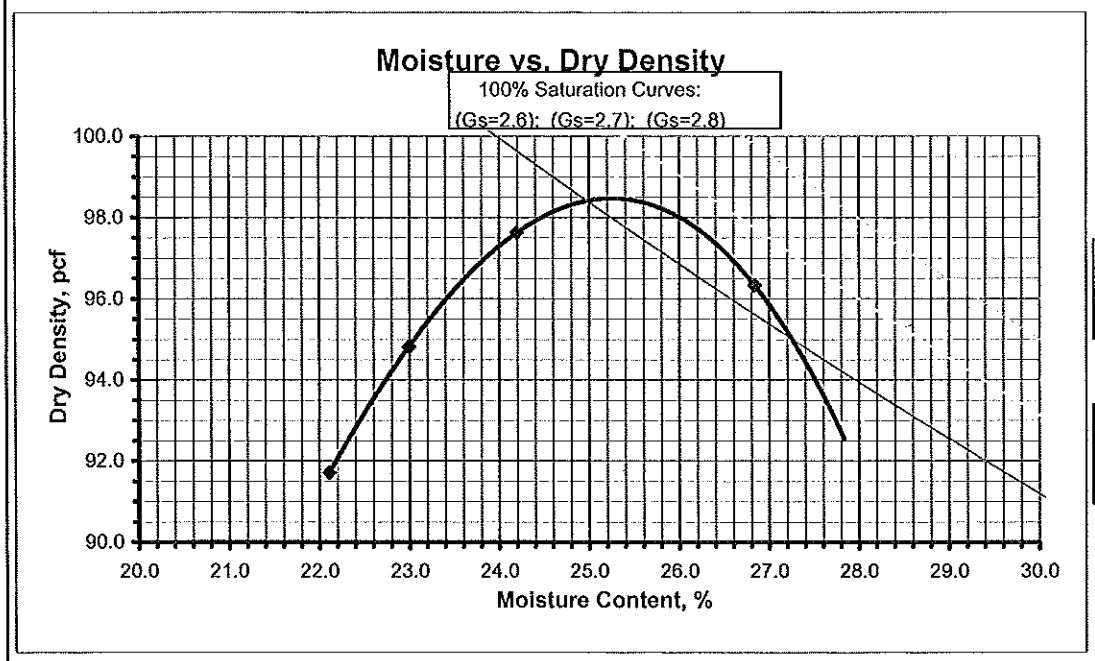
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	670.1	73.0
Mass of Dry Sample & Tare, g	578.5	73.0
Mass of Tare, g	159.2	0.0
Moisture Content, %	21.8	0.0

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5942.0	6012.0	6082.0	6096.0	
Mass of Wet Sample & Tare, g	401.0	414.0	402.0	414.0	
Mass of Dry Sample & Tare, g	342.7	351.0	337.8	341.0	
Mass of Tare, g	79.0	77.0	72.5	69.0	
Moisture Content, %	22.1	23.0	24.2	26.8	
Wet Density, pcf	112.0	116.6	121.3	122.2	
Dry Density, pcf	91.7	94.8	97.6	96.3	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	316
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

Red Sandy Fat Clay

USCS (ASTM D2487; D2488): CH

Maximum Dry Density, pcf	98.5	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	25.3	**Corrected Optimum Moisture Content, %**	NA

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Tested By	RI/KI
Date	08/22/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-1
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	9806/ PC-4	Depth/Elev.	EL-596.7'
Location	N 582785.4' E1505825.6'	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	2.577	in	6.55	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.40	cm^3	0.0095	ft^3
Mass	533.00	g	1.18	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	96.0	pcf		

Moisture Content

Mass of wet sample & tare	223.70	g
Mass of dry sample & tare	189.80	g
Mass of tare	71.50	g
% Moisture	28.7	

Test Data

Speed	12	
Board Number	4	
Cell Number	9	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	176.55	cm
Min Head	175.15	cm
Maximum Gradient	26.86	
Minimum Gradient	26.64	

Final Data (After Test)

Average Height of Sample			2.588	in	6.57	cm
Average Diameter of Sample			2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2		
Volume	271.69	cm^3	0.0096	ft^3		
Mass	537.00	g	1.18	lb		

Dry Density	94.8	pcf
Vol. of Voids	118.83	cm^3
Vol. of Solids	152.86	cm^3
Void Ratio	0.78	
Saturation	104.6	%

Moisture Content

Mass of wet sample & tare	694.90	g
Mass of dry sample & tare	570.60	g
Mass of tare	157.80	g
% Moisture	30.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
08/22/10	12	30	-	2.51	176.55	26.86	28.2	-	-	-	
08/22/10	12	40	600	2.51	176.55	26.86	28.2	5.04E-08	0.828	4.18E-08	
08/22/10	12	50	600	2.49	175.15	26.64	28.2	5.06E-08	0.828	4.19E-08	
08/22/10	13	0	600	2.50	175.85	26.75	28.2	5.08E-08	0.828	4.20E-08	*
08/22/10	13	10	600	2.49	175.15	26.64	28.2	5.08E-08	0.828	4.20E-08	*
08/22/10	13	20	600	2.51	176.55	26.86	28.2	5.06E-08	0.828	4.19E-08	*
08/22/10	13	30	600	2.50	175.85	26.75	28.2	5.05E-08	0.828	4.18E-08	*

Reported Average Hydraulic Conductivity* 4.2E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: Red Sandy Fat Clay

USCS (ASTM D2487;2488): CH

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 97.5% of maximum dry density (standard proctor) at 3.4% above optimum moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAP® AASHTO R18

Tested By	RI
Date	11/[illegible]/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10440/PC-5	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	963.50
Mass of Dry Sample & Tare, g	799.00
Mass of Tare, g	323.00
Moisture Content, %	34.6

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	356.40
Mass of Dry Sample & Tare, g	325.60
Mass of Tare, g	102.50
Moisture Content, %	13.8

Mass of Total Sample before separation on #4 sieve & Tare, g	21400.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	18804.02

Mass of Sample used for hydrometer analysis, g	66.80
Dry Mass, g	58.70
% of Total Sample passing #4 sieve	100.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"			0.0	100.0
.375"			0.0	100.0
#4	COARSE SAND	0.00	0.0	100.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.21	99.6
#20		1.33	97.7
#40	FINE SAND	2.55	95.7
#60		3.09	94.7
#100		5.72	90.3
#200	FINES	7.14	87.8

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	9:30

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	4.0
% COARSE GRAVEL	0.0	% FINE SAND	7.8
% FINE GRAVEL	0.0	% FINES	87.8
% COARSE SAND	0.4	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	64.5	% CLAY(<0.002mm)	56.6

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/09/10	9:32	2	53.5	20.4	0.01344	5.5	48.0	8.4	0.99	0.0276	81.0
11/09/10	9:35	5	52.5	20.4	0.01344	5.5	47.0	8.6	0.99	0.0176	79.3
11/09/10	9:45	15	49.0	20.4	0.01344	5.5	43.5	9.2	0.99	0.0105	73.4
11/09/10	10:00	30	46.5	20.4	0.01344	5.5	41.0	9.6	0.99	0.0076	69.2
11/09/10	10:30	60	44.5	20.4	0.01344	5.5	39.0	9.9	0.99	0.0055	65.8
11/09/10	13:40	250	40.0	20.4	0.01344	5.5	34.5	10.7	0.99	0.0028	58.2
11/10/10	9:30	1440	38.0	20.4	0.01344	5.5	32.5	11.0	0.99	0.0012	54.8

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

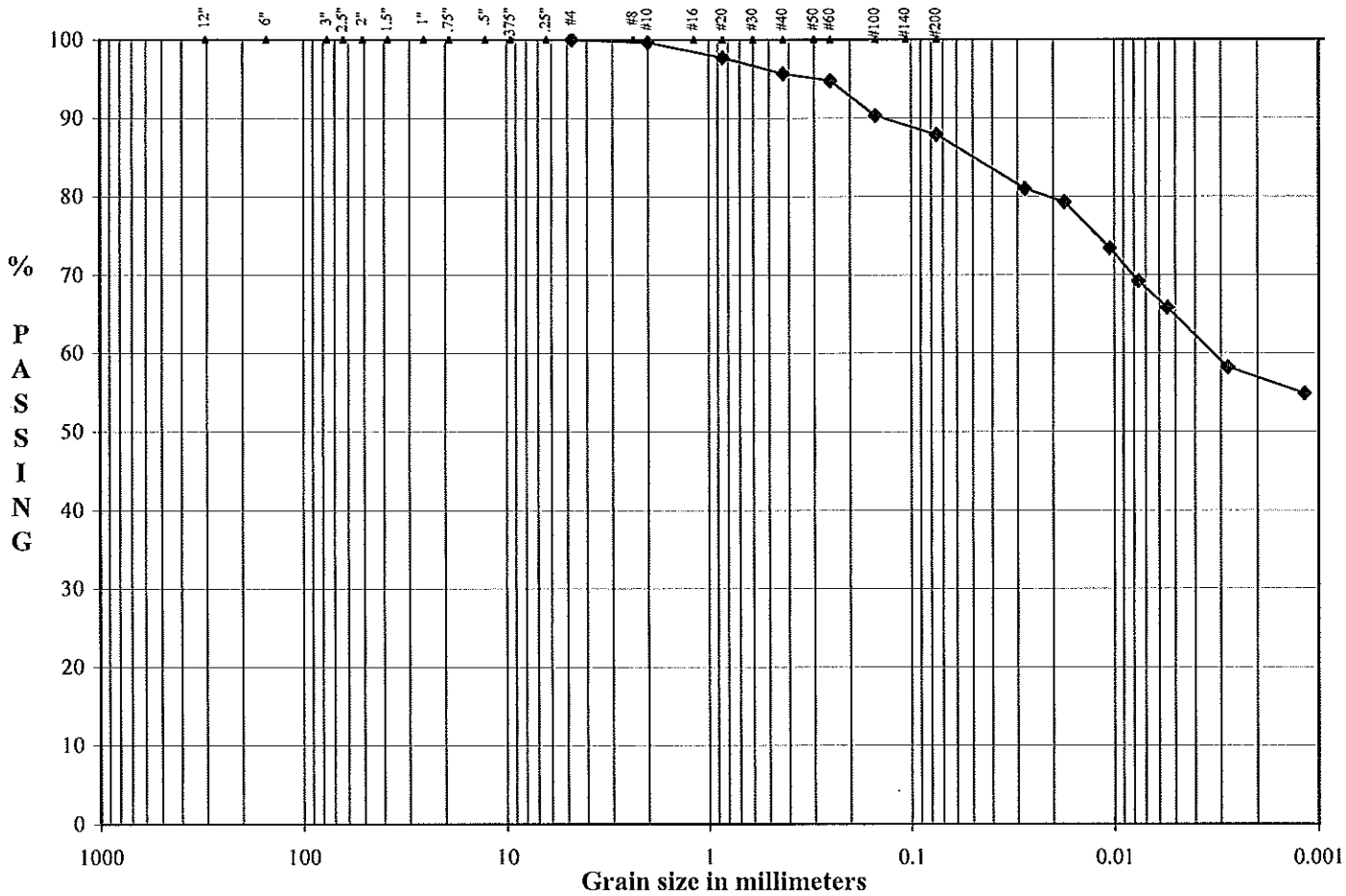
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: RI Date: 11/05/10 Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10440/PC-5	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Elastic Silt

SCS (ASTM D2487; D2488): MH

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AASHTO R18

Tested By	NK
Date	11/09/1[illegible]
Checked By	[illegible]

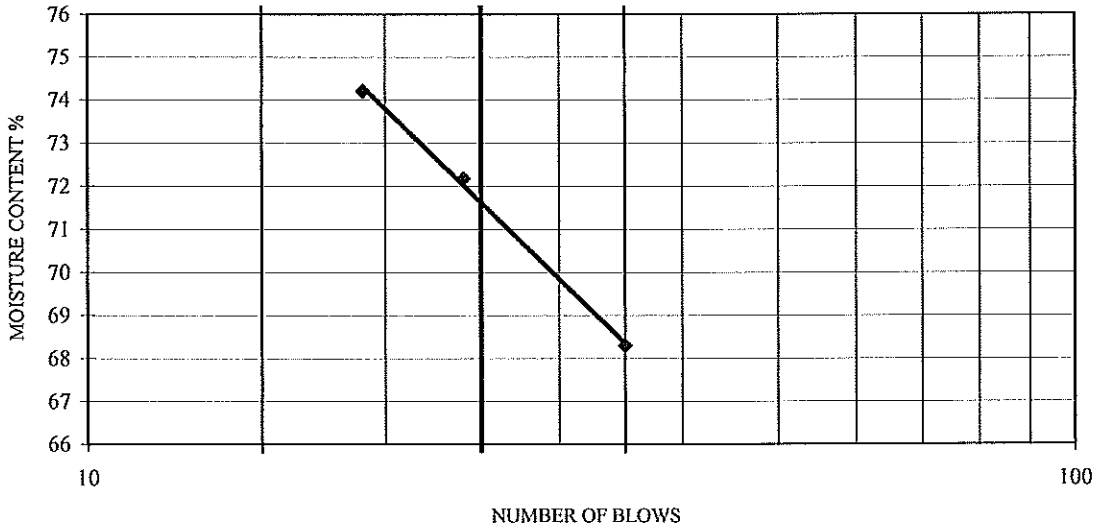
Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10440/PC-5	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 4318/AASHTO T 88, T 89
Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	35	24	19
Mass of Wet Sample & Tare, g	35.93	34.31	35.15
Mass of Dry Sample & Tare, g	31.45	29.98	30.00
Mass of Tare, g	24.89	23.98	23.06
Moisture Content, %	68.29	72.17	74.21

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	31.39	34.39
Mass of Dry Sample & Tare, g	29.32	31.53
Mass of Tare, g	23.33	23.51
Moisture Content, %	34.56	35.66

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	963.50
Mass of Dry Sample & Tare, g	799.00
Mass of Tare, g	323.00
Moisture Content, %	34.56

LIQUID LIMIT (LL)	72
PLASTIC LIMIT (PL)	35
PLASTICITY INDEX (PI)	37
LIQUIDITY INDEX (LI)	-0.01

DESCRIPTION: Red Elastic Silt

USCS (ASTM D2487; D2488): MH

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AASHTO R18	Tested By: RI Date: 11/03/10 Checked By: [illegible]

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10440/PC-5	Depth/Elev.	-
Location	-	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	21400.0	15903.8
Mass of Mat. Retained on No. 4 sieve, g	0.0	0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
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, %	0.0
Material Retained on 3/4" Sieve, %	0.0
Total, % (oversized)	0.0

MOISTURE CONTENT

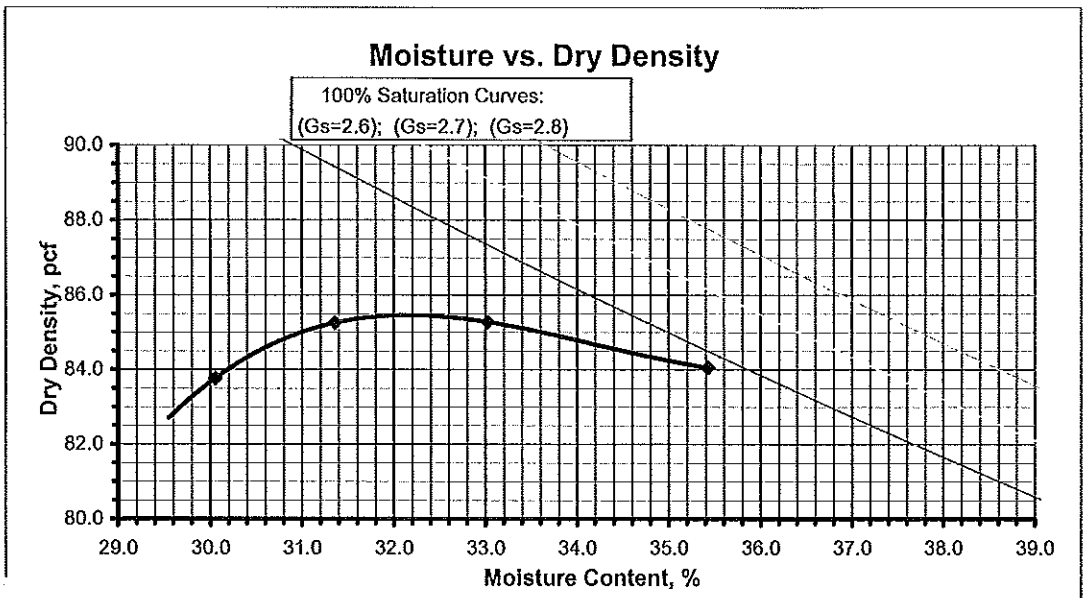
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	963.5	
Mass of Dry Sample & Tare, g	799.0	
Mass of Tare, g	323.0	
Moisture Content, %	34.6	

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5896.0	5942.0	5964.0	5970.0	
Mass of Wet Sample & Tare, g	526.5	594.0	529.0	538.5	
Mass of Dry Sample & Tare, g	432.1	481.8	428.7	428.1	
Mass of Tare, g	118.0	124.0	125.0	116.5	
Moisture Content, %	30.1	31.4	33.0	35.4	
Wet Density, pcf	108.9	112.0	113.4	113.8	
Dry Density, pcf	83.8	85.3	85.3	84.1	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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

Red Elastic Silt

USCS (ASTM D2487; D2488): MH

Maximum Dry Density, pcf	85.5	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	32.2	**Corrected Optimum Moisture Content, %**	NA

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AAP® AASHTO R18

Tested By	RI
Date	11/[illegible]/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10441/PC-6	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	1053.00
Mass of Dry Sample & Tare, g	808.50
Mass of Tare, g	167.50
Moisture Content, %	38.1

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	318.80
Mass of Dry Sample & Tare, g	285.50
Mass of Tare, g	90.20
Moisture Content, %	17.1

Mass of Total Sample before separation on #4 sieve & Tare, g	22300.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	19051.57

Mass of Sample used for hydrometer analysis, g	67.00
Dry Mass, g	57.24
% of Total Sample passing #4 sieve	100.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"			0.0	100.0
.375"			0.0	100.0
#4	COARSE SAND	0.00	0.0	100.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsleve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.08	99.9
#20		0.69	98.8
#40	FINE SAND	1.71	97.0
#60		3.35	94.1
#100		5.19	90.9
#200	FINES	6.99	87.8

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	9:32

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	2.8
% COARSE GRAVEL	0.0	% FINE SAND	9.2
% FINE GRAVEL	0.0	% FINES	87.8
% COARSE SAND	0.1	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	66.9	% CLAY(<0.002mm)	58.0

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/09/10	9:34	2	52.0	20.4	0.01344	5.5	46.5	8.7	0.99	0.0280	80.4
11/09/10	9:37	5	50.5	20.4	0.01344	5.5	45.0	8.9	0.99	0.0179	77.8
11/09/10	9:47	15	47.5	20.4	0.01344	5.5	42.0	9.4	0.99	0.0106	72.6
11/09/10	10:02	30	46.5	20.4	0.01344	5.5	41.0	9.6	0.99	0.0076	70.9
11/09/10	10:32	60	45.0	20.4	0.01344	5.5	39.5	9.8	0.99	0.0054	68.3
11/09/10	13:42	250	40.0	20.4	0.01344	5.5	34.5	10.7	0.99	0.0028	59.7
11/10/10	9:32	1440	38.0	20.4	0.01344	5.5	32.5	11.0	0.99	0.0012	56.2

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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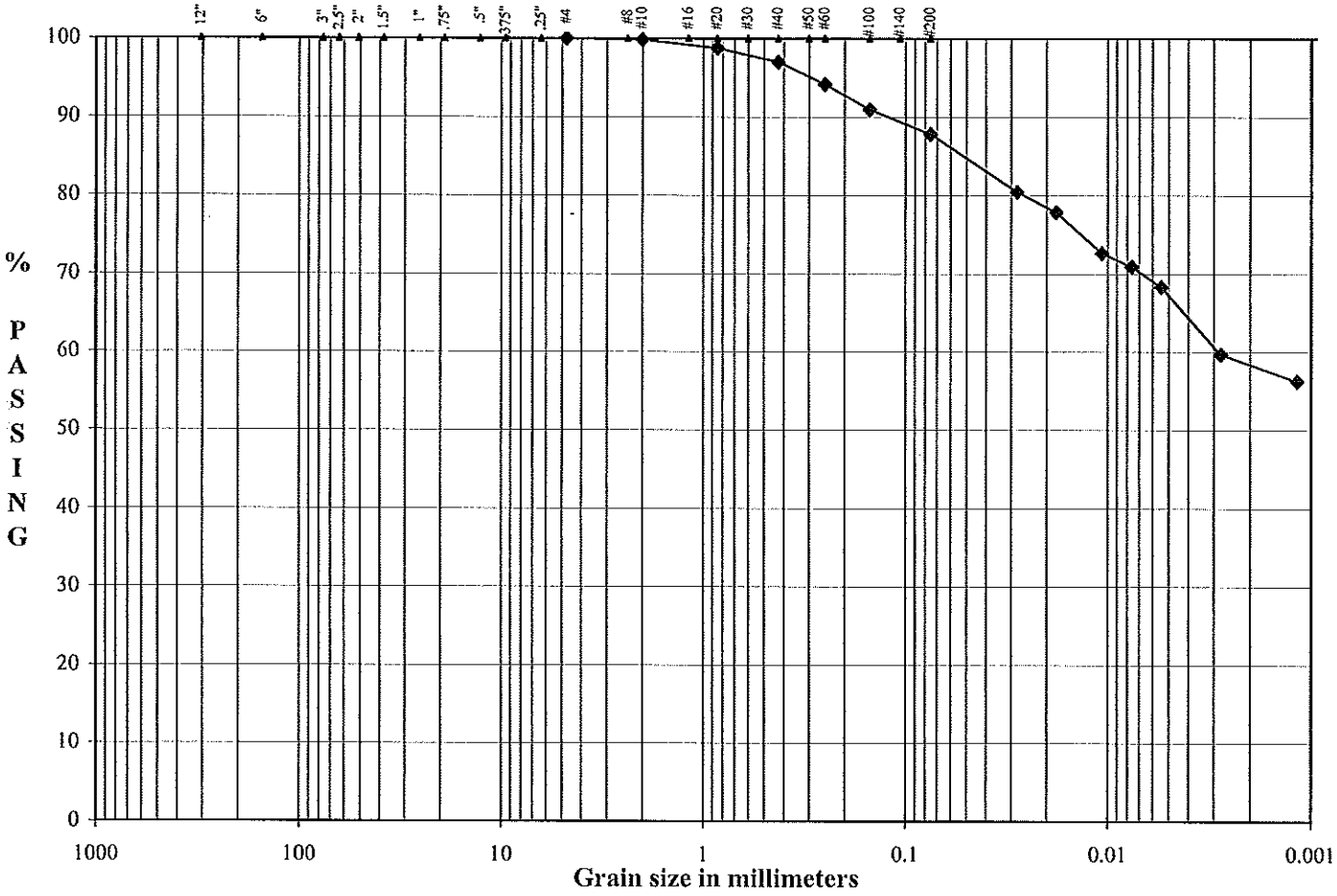
Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10441/PC-6	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Elastic Silt

USCS (ASTM D2487; D2488): MH

TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: NK Date: 11/09/10 Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10441/PC-6	Depth/Elev.	-
Location	-	Add. Info	-

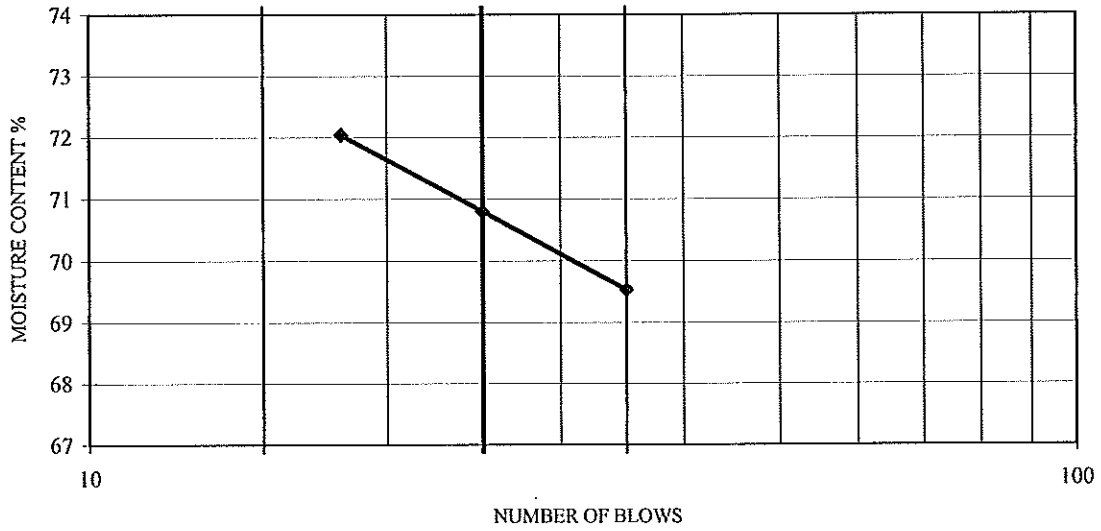
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	35	25	18
Mass of Wet Sample & Tare, g	34.68	38.55	37.87
Mass of Dry Sample & Tare, g	30.23	33.46	33.13
Mass of Tare, g	23.83	26.27	26.55
Moisture Content, %	69.53	70.79	72.04

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	34.43	30.85
Mass of Dry Sample & Tare, g	31.99	28.56
Mass of Tare, g	25.49	22.47
Moisture Content, %	37.54	37.60

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	1053.00
Mass of Dry Sample & Tare, g	808.50
Mass of Tare, g	167.50
Moisture Content, %	38.14

LIQUID LIMIT (LL)	71
PLASTIC LIMIT (PL)	38
PLASTICITY INDEX (PI)	33
LIQUIDITY INDEX (LI)	0.00

DESCRIPTION: Red Elastic Silt

USCS (ASTM D2487; D2488): MH

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	RI
Date	11/03/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10441/PC-6	Depth/Elev.	-
Location	-	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	22300.0	16142.6
Mass of Mat. Retained on No. 4 sieve, g	0.0	0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
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, %	0.0
Material Retained on 3/4" Sieve, %	0.0
Total, % (oversized)	0.0

MOISTURE CONTENT

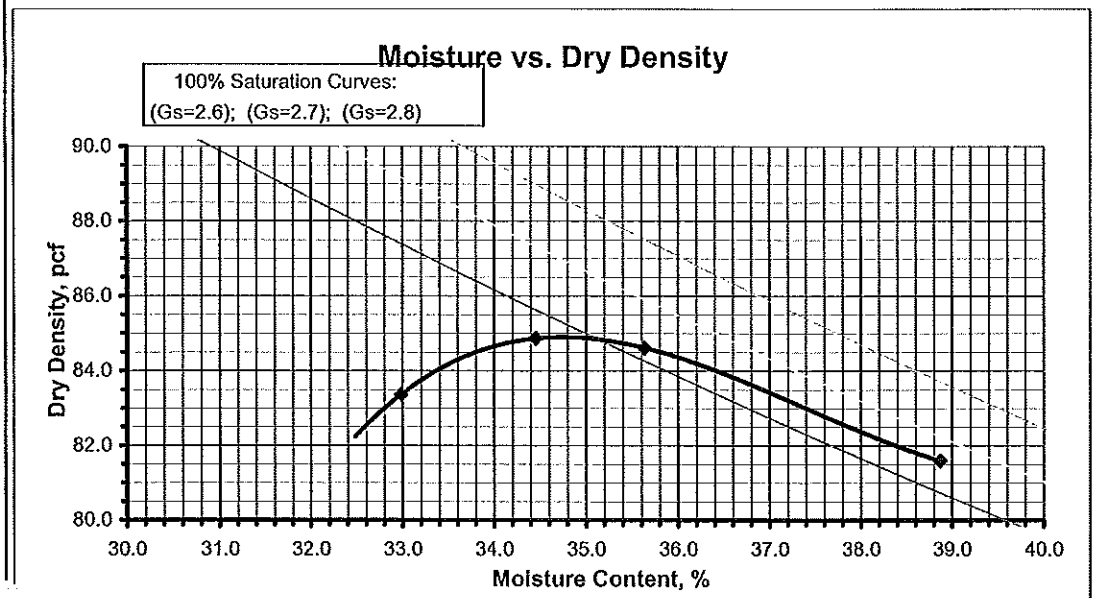
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	1053.0	
Mass of Dry Sample & Tare, g	808.5	
Mass of Tare, g	167.5	
Moisture Content, %	38.1	

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5925.0	5974.0	5984.0	5962.0	
Mass of Wet Sample & Tare, g	504.0	540.5	514.0	522.0	
Mass of Dry Sample & Tare, g	410.0	433.9	411.8	410.6	
Mass of Tare, g	125.0	124.5	125.0	124.0	
Moisture Content, %	33.0	34.5	35.6	38.9	
Wet Density, pcf	110.9	114.1	114.8	113.3	
Dry Density, pcf	83.4	84.9	84.6	81.6	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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
Red Elastic Silt

USCS (ASTM D2487; D2488)
MH

Maximum Dry Density, pcf	84.8	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	34.8	**Corrected Optimum Moisture Content, %**	NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AAP® AASHTO R18

Tested By	VG
Date	11/1[illegible]/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10528/PC-7	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	696.00
Mass of Dry Sample & Tare, g	554.10
Mass of Tare, g	162.50
Moisture Content, %	36.2

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	185.50
Mass of Dry Sample & Tare, g	167.42
Mass of Tare, g	101.40
Moisture Content, %	27.4

Mass of Total Sample before separation on #4 sieve & Tare, g	16900.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	13266.80

Mass of Sample used for hydrometer analysis, g	63.90
Dry Mass, g	50.16
% of Total Sample passing #4 sieve	100.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"			0.0	100.0
.375"			0.0	100.0
#4	COARSE SAND	0.00	0.0	100.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.02	100.0
#20		0.16	99.7
#40	FINE SAND	0.48	99.0
#60		1.43	97.1
#100		3.33	93.4
#200	FINES	6.61	86.8

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	10:30

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	0.9
% COARSE GRAVEL	0.0	% FINE SAND	12.2
% FINE GRAVEL	0.0	% FINES	86.8
% COARSE SAND	0.0	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	64.9	% CLAY(<0.002mm)	59.1

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/16/10	10:32	2	46.5	20.3	0.01344	5.5	41.0	9.6	0.99	0.0294	80.9
11/16/10	10:35	5	45.0	20.3	0.01344	5.5	39.5	9.8	0.99	0.0188	78.0
11/16/10	10:45	15	43.0	20.3	0.01344	5.5	37.5	10.2	0.99	0.0111	74.0
11/16/10	11:00	30	41.0	20.3	0.01344	5.5	35.5	10.5	0.99	0.0079	70.1
11/16/10	11:30	60	39.0	20.3	0.01344	5.5	33.5	10.8	0.99	0.0057	66.1
11/16/10	14:40	250	36.5	20.3	0.01344	5.5	31.0	11.2	0.99	0.0028	61.2
11/17/10	10:30	1440	34.5	20.3	0.01344	5.5	29.0	11.6	0.99	0.0012	57.2

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

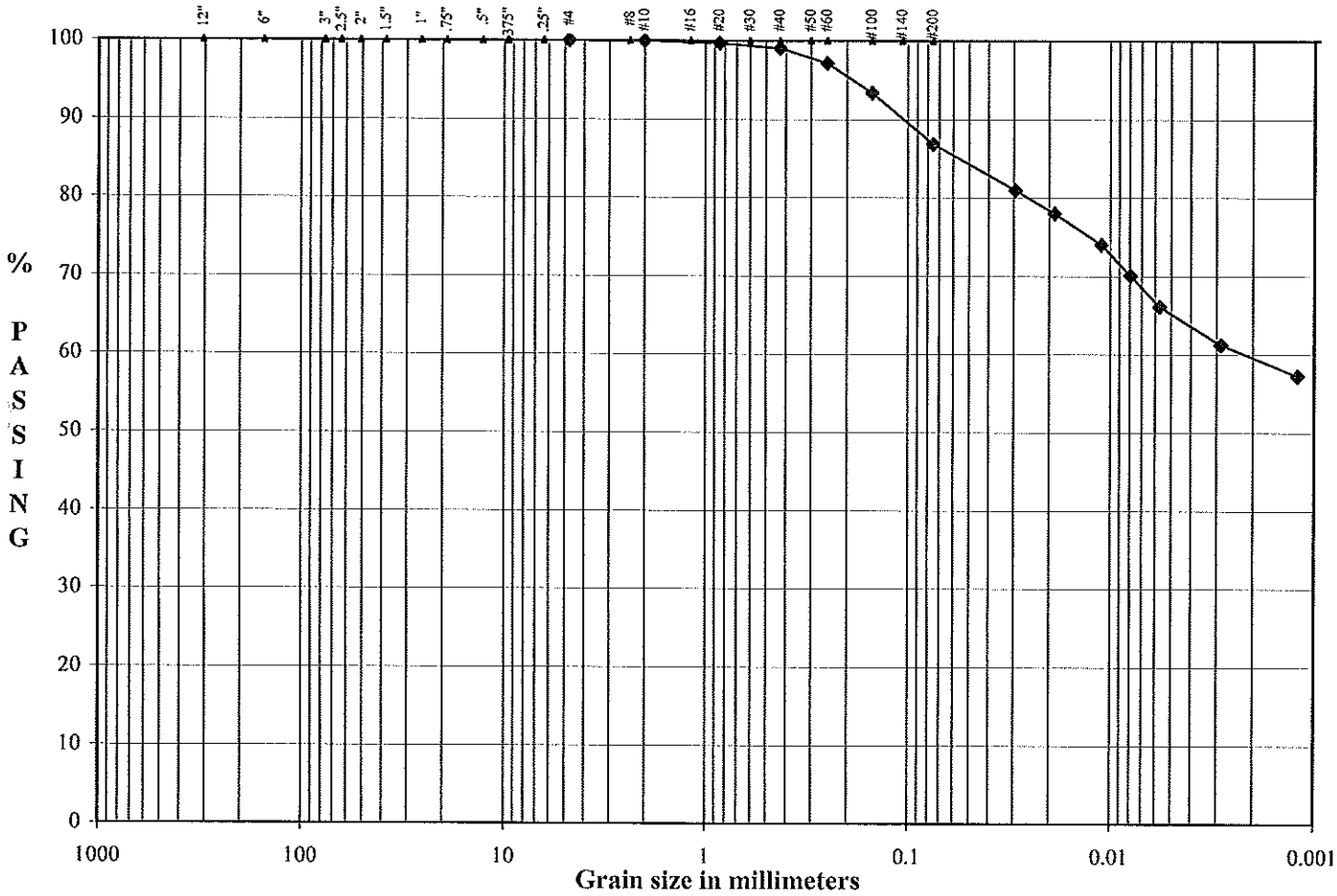
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: VG Date: 11/15/10 Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10528/PC-7	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Elastic Silt

CS (ASTM D2487; D2488): MH

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AASHTO R18

Tested By	NK
Date	11/15/1
Checked By	

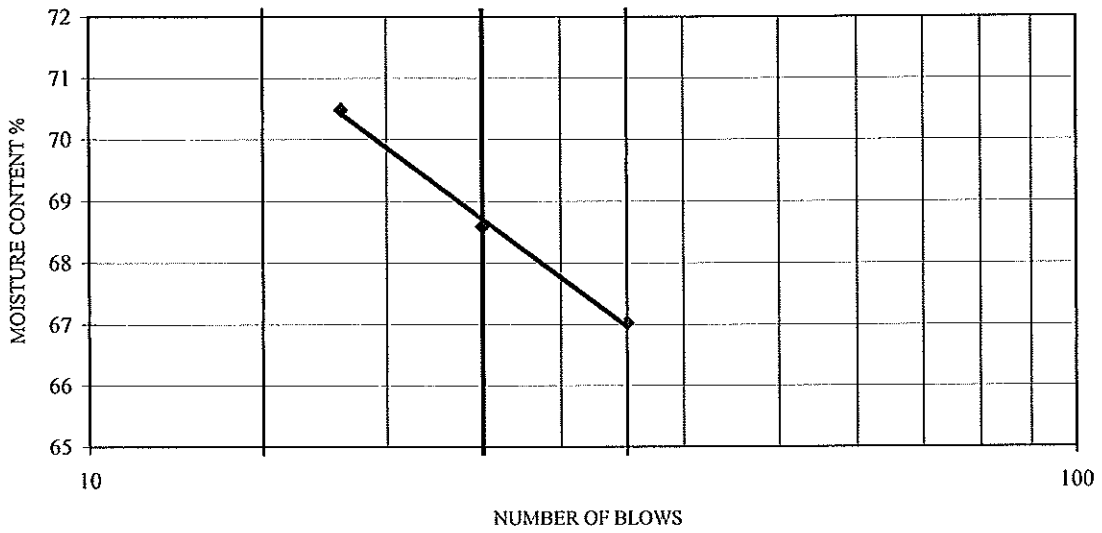
Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10528/PC-7	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 4318/AASHTO T 88, T 89
Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	35	25	18
Mass of Wet Sample & Tare, g	37.87	34.94	35.24
Mass of Dry Sample & Tare, g	32.85	30.42	30.80
Mass of Tare, g	25.36	23.83	24.50
Moisture Content, %	67.02	68.59	70.48

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	34.80	32.93
Mass of Dry Sample & Tare, g	32.24	30.13
Mass of Tare, g	25.45	22.60
Moisture Content, %	37.70	37.18

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	696.00
Mass of Dry Sample & Tare, g	554.10
Mass of Tare, g	162.50
Moisture Content, %	36.24

LIQUID LIMIT (LL)	69
PLASTIC LIMIT (PL)	37
PLASTICITY INDEX (PI)	32
LIQUIDITY INDEX (LI)	-0.02

DESCRIPTION: Red Elastic Silt

USCS (ASTM D2487; D2488): MH

AASHTO (M 145): NA

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AAR AASHTO R18

Tested By	RI
Date	11/12/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10528/PC-7	Depth/Elev.	-
Location	-	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	16900.0	12404.9
Mass of Mat. Retained on No. 4 sieve, g	0.0	0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
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, %	0.0
Material Retained on 3/4" Sieve, %	0.0
Total, % (oversized)	0.0

MOISTURE CONTENT

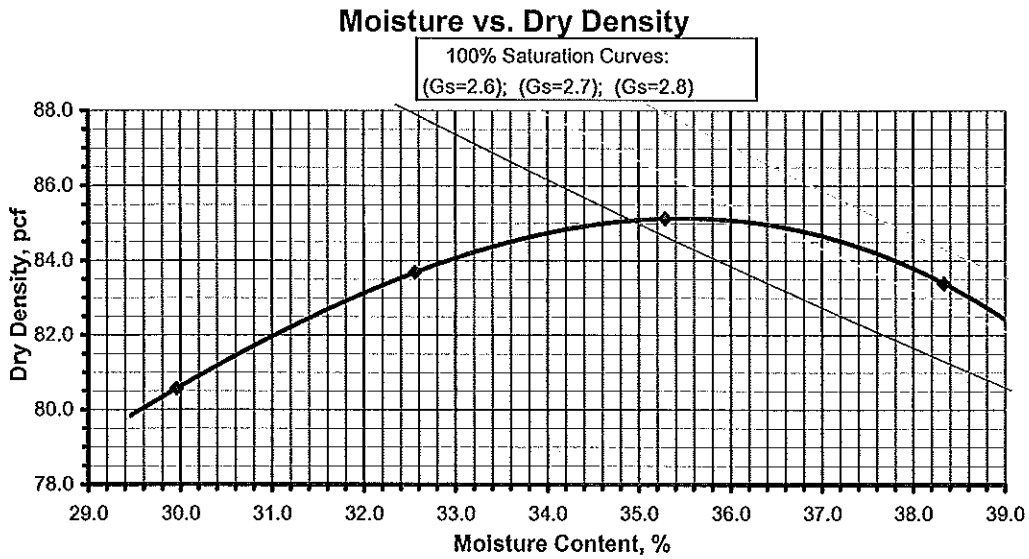
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	696.0	
Mass of Dry Sample & Tare, g	554.1	
Mass of Tare, g	162.5	
Moisture Content, %	36.2	

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5832.0	5926.0	5990.0	5993.0	
Mass of Wet Sample & Tare, g	514.5	517.0	527.0	530.0	
Mass of Dry Sample & Tare, g	415.6	413.6	416.3	410.7	
Mass of Tare, g	85.5	96.0	102.5	99.5	
Moisture Content, %	30.0	32.6	35.3	38.3	
Wet Density, pcf	104.7	110.9	115.2	115.4	
Dry Density, pcf	80.6	83.7	85.1	83.4	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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
Red Elastic Silt

USCS (ASTM D2487; D2488): MH

Maximum Dry Density, pcf	85.2	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	35.5	**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	VG
Date	11/19/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10528/PC-7	Depth/Elev.	-
Location	-	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	2.571	in	6.53	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.77	cm^3	0.0095	ft^3
Mass	509.44	g	1.12	lb
Specific Gravity	2.800	(Assumed)		
Dry Density	85.1	pcf		

Moisture Content

Mass of wet sample & tare	500.60	g
Mass of dry sample & tare	360.30	g
Mass of tare	0.00	g
% Moisture	38.9	

Test Data

Speed	12	
Board Number	5	
Cell Number	5	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	116.06	cm
Min Head	115.36	cm
Maximum Gradient	17.61	
Minimum Gradient	17.50	

Final Data (After Test)

Average Height of Sample			2.595	in	6.59	cm
Average Diameter of Sample			2.877	in	7.31	cm
Area	6.50	in^2	41.94	cm^2		
Volume	276.44	cm^3	0.0098	ft^3		
Mass	516.70	g	1.14	lb		

Dry Density	82.8	pcf
Vol. of Voids	145.45	cm^3
Vol. of Solids	130.99	cm^3
Void Ratio	1.11	
Saturation	103.1	%

Moisture Content

Mass of wet sample & tare	592.30	g
Mass of dry sample & tare	442.40	g
Mass of tare	75.70	g
% Moisture	40.9	

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	
11/19/10	9	45	-	1.65	116.06	17.61	18.5	-	-	-	
11/19/10	9	50	300	1.64	115.36	17.50	18.5	7.61E-08	1.038	7.90E-08	
11/19/10	9	55	300	1.65	116.06	17.61	18.5	7.61E-08	1.038	7.90E-08	
11/19/10	10	0	300	1.65	116.06	17.61	18.5	7.58E-08	1.038	7.87E-08	*
11/19/10	10	5	300	1.65	116.06	17.61	18.5	7.58E-08	1.038	7.87E-08	*
11/19/10	10	10	300	1.64	115.36	17.50	18.5	7.61E-08	1.038	7.90E-08	*
11/19/10	10	15	300	1.65	116.06	17.61	18.5	7.61E-08	1.038	7.90E-08	*

Reported Average Hydraulic Conductivity* 7.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: Red Elastic Silt

USCS (ASTM D2487;2488): MH

REMARKS: Material passed #4 sieve used for testing. Material was remolded to 100.1% of maximum dry density (standard proctor) at 3.4% above optimum moisture content.

Flow pump ID #	244	Balance ID #	1/6/7	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

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AAP® AASHTO R18

Tested By	VG
Date	11/16/10
Checked By	JB

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10529/PC-8	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	790.00
Mass of Dry Sample & Tare, g	637.50
Mass of Tare, g	153.00
Moisture Content, %	31.5

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	203.00
Mass of Dry Sample & Tare, g	183.97
Mass of Tare, g	101.50
Moisture Content, %	23.1

Mass of Total Sample before separation on #4 sieve & Tare, g	21300.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	17306.51

Mass of Sample used for hydrometer analysis, g	64.80
Dry Mass, g	52.65
% of Total Sample passing #4 sieve	100.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"			0.0	100.0
.375"			0.0	100.0
#4	COARSE SAND	0.00	0.0	100.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.00	100.0
#20		0.27	99.5
#40	FINE SAND	1.05	98.0
#60		3.05	94.2
#100		5.53	89.5
#200	FINES	8.28	84.3

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	10:32

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	2.0
% COARSE GRAVEL	0.0	% FINE SAND	13.7
% FINE GRAVEL	0.0	% FINES	84.3
% COARSE SAND	0.0	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	67.3	% CLAY(<0.002mm)	60.2

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/16/10	10:34	2	47.5	20.3	0.01344	5.5	42.0	9.4	0.99	0.0292	79.0
11/16/10	10:37	5	46.0	20.3	0.01344	5.5	40.5	9.7	0.99	0.0187	76.2
11/16/10	10:47	15	45.0	20.3	0.01344	5.5	39.5	9.8	0.99	0.0109	74.3
11/16/10	11:02	30	43.5	20.3	0.01344	5.5	38.0	10.1	0.99	0.0078	71.5
11/16/10	11:32	60	42.0	20.3	0.01344	5.5	36.5	10.3	0.99	0.0056	68.6
11/16/10	14:42	250	38.5	20.3	0.01344	5.5	33.0	10.9	0.99	0.0028	62.1
11/17/10	10:32	1440	36.5	20.3	0.01344	5.5	31.0	11.2	0.99	0.0012	58.3

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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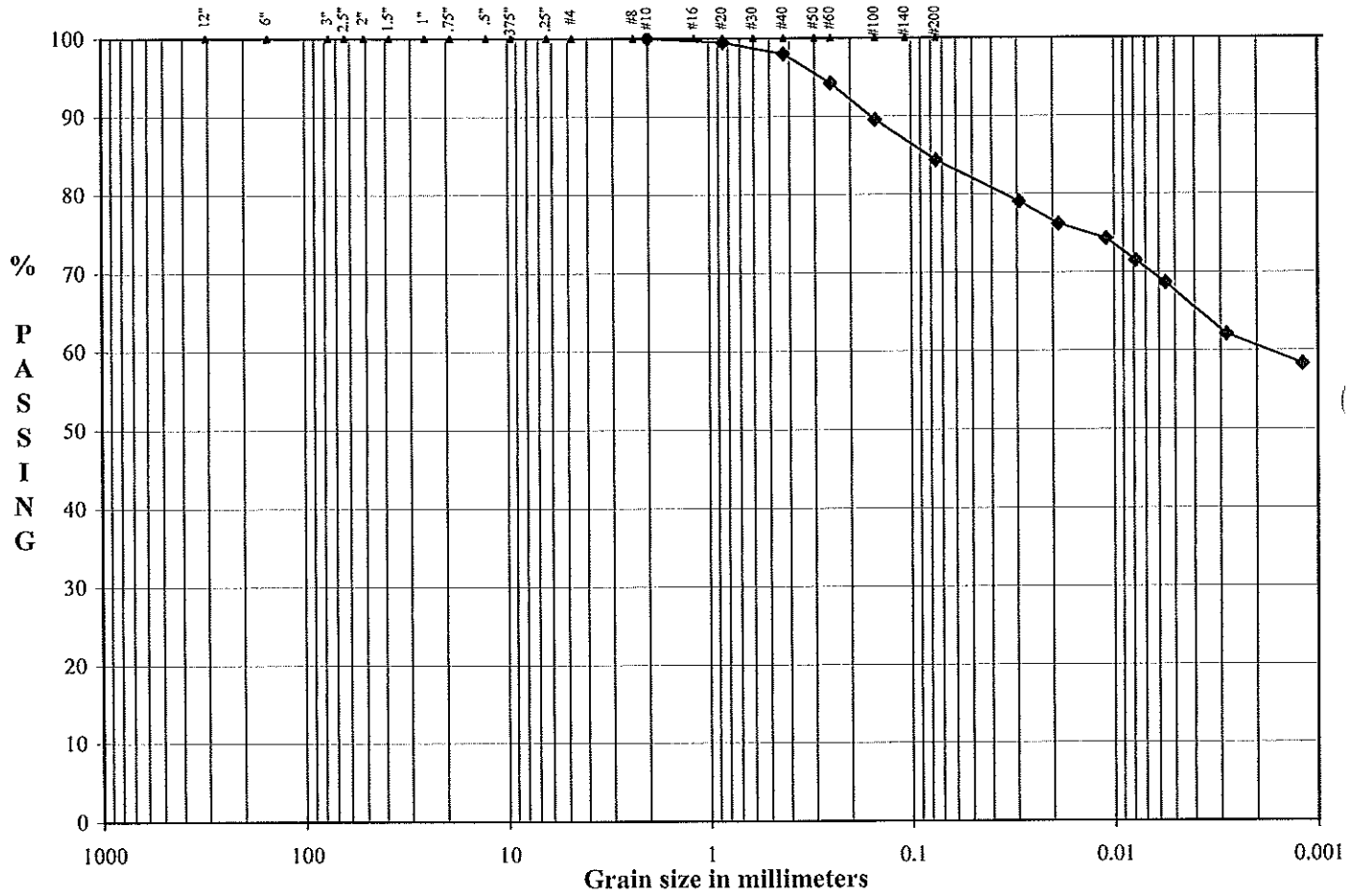
Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10529/PC-8	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487; D2488): CH

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AASHTO R18

Tested By	NK
Date	11/15/10
Checked By	

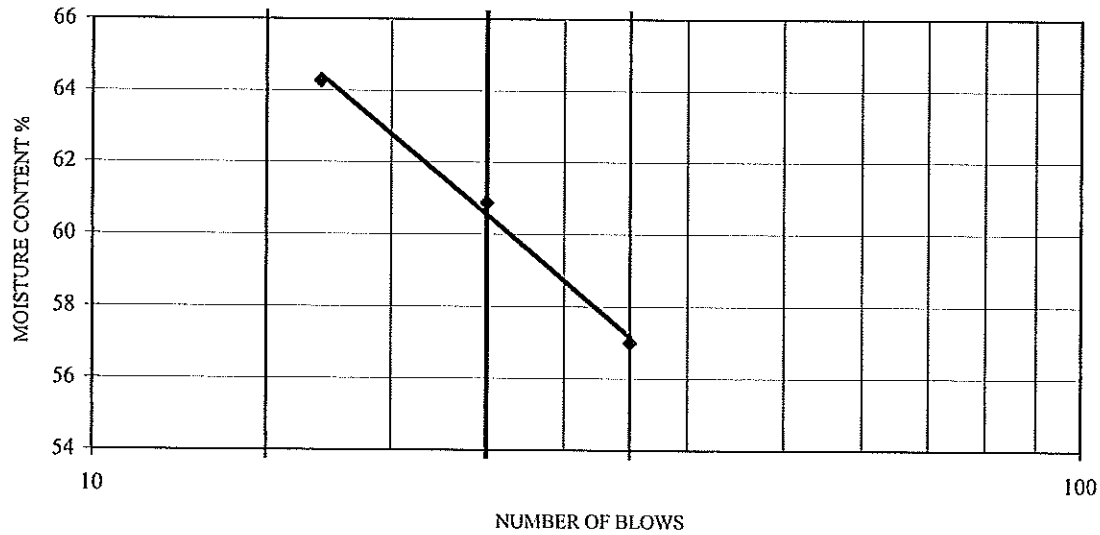
Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10529/PC-8	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 4318/AASHTO T 88, T 89
Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	35	25	17
Mass of Wet Sample & Tare, g	39.27	38.55	37.33
Mass of Dry Sample & Tare, g	33.97	33.87	33.00
Mass of Tare, g	24.67	26.18	26.27
Moisture Content, %	56.99	60.86	64.27

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	33.56	34.64
Mass of Dry Sample & Tare, g	31.75	31.99
Mass of Tare, g	25.29	22.72
Moisture Content, %	28.02	28.59

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	790.00
Mass of Dry Sample & Tare, g	637.50
Mass of Tare, g	153.00
Moisture Content, %	31.48

LIQUID LIMIT (LL)	61
PLASTIC LIMIT (PL)	28
PLASTICITY INDEX (PI)	33
LIQUIDITY INDEX (LI)	0.11

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487; D2488): CH

AASHTO (M 145): NA

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AASHTO R18

Tested By	RI
Date	11/
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10529/PC-8	Depth/Elev.	-
Location	-	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	21300.0	16200.7
Mass of Mat. Retained on No. 4 sieve, g	0.0	0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
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, %	0.0
Material Retained on 3/4" Sieve, %	0.0
Total, % (oversized)	0.0

MOISTURE CONTENT

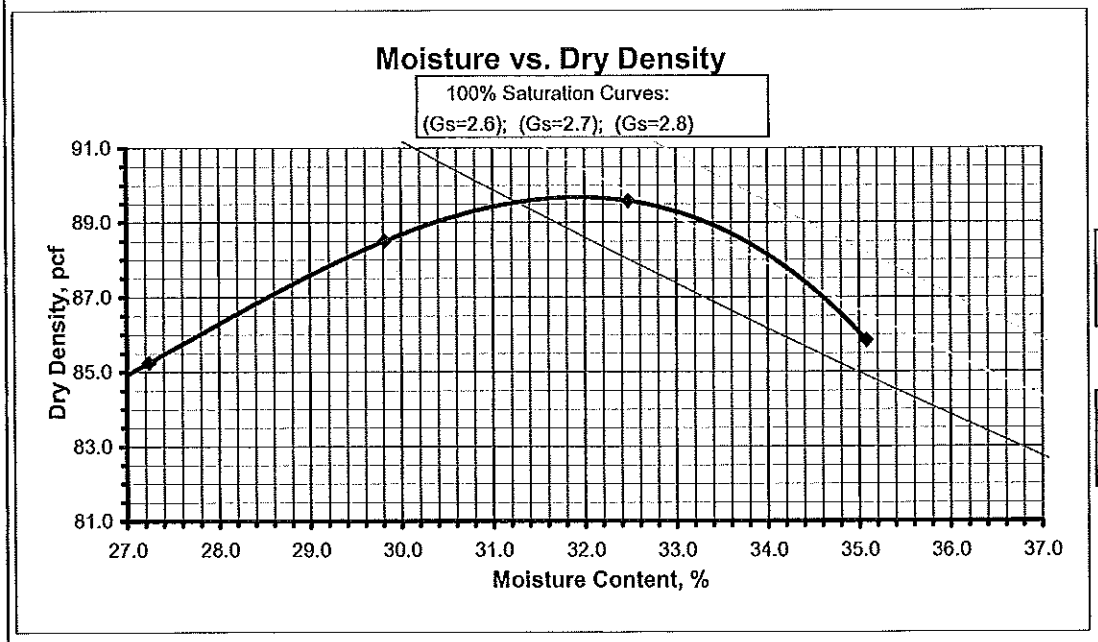
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	790.0	
Mass of Dry Sample & Tare, g	637.5	
Mass of Tare, g	153.0	
Moisture Content, %	31.5	

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5889.0	5986.0	6043.0	6002.0	
Mass of Wet Sample & Tare, g	512.5	515.5	525.0	531.5	
Mass of Dry Sample & Tare, g	421.4	420.4	419.1	419.7	
Mass of Tare, g	87.0	101.5	93.0	101.0	
Moisture Content, %	27.2	29.8	32.5	35.1	
Wet Density, pcf	108.5	114.9	118.7	116.0	
Dry Density, pcf	85.3	88.5	89.6	85.8	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.03
Hammer ID Number	31b
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

Red Fat Clay with Sand

USCS (ASTM D2487; D2488): CH

Maximum Dry Density, pcf	89.7	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	32.0	**Corrected Optimum Moisture Content, %**	NA

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Web: www.test-llc.com

AAP AASHTO R18

Tested By	VG
Date	11/19/10
Checked By	VK

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10529/PC-8	Depth/Elev.	-
Location	-	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	2.576	in	6.54	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.29	cm^3	0.0095	ft^3
Mass	523.68	g	1.15	lb
Specific Gravity	2.800	(Assumed)		
Dry Density	89.5	pcf		

Moisture Content

Mass of wet sample & tare	599.30	g
Mass of dry sample & tare	461.00	g
Mass of tare	71.70	g
% Moisture	35.5	

Test Data

Speed	12	
Board Number	6	
Cell Number	3	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	142.09	cm
Min Head	141.38	cm
Maximum Gradient	21.50	
Minimum Gradient	21.39	

Final Data (After Test)

Average Height of Sample			2.602	in	6.61	cm
Average Diameter of Sample			2.888	in	7.34	cm
Area	6.55	in^2	42.26	cm^2		
Volume	279.31	cm^3	0.0099	ft^3		
Mass	535.20	g	1.18	lb		

Dry Density	86.4	pcf
Vol. of Voids	141.20	cm^3
Vol. of Solids	138.11	cm^3
Void Ratio	1.02	
Saturation	105.2	%

Moisture Content

Mass of wet sample & tare	637.40	g
Mass of dry sample & tare	489.00	g
Mass of tare	102.50	g
% Moisture	38.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/19/10	9	45	-	2.01	141.38	21.39	18.5	-	-	-	
11/19/10	9	50	300	2.02	142.09	21.50	18.5	6.18E-08	1.038	6.41E-08	
11/19/10	9	55	300	2.02	142.09	21.50	18.5	6.16E-08	1.038	6.40E-08	
11/19/10	10	0	300	2.01	141.38	21.39	18.5	6.18E-08	1.038	6.41E-08	*
11/19/10	10	5	300	2.01	141.38	21.39	18.5	6.19E-08	1.038	6.43E-08	*
11/19/10	10	10	300	2.02	142.09	21.50	18.5	6.18E-08	1.038	6.41E-08	*
11/19/10	10	15	300	2.02	142.09	21.50	18.5	6.16E-08	1.038	6.40E-08	*

Reported Average Hydraulic Conductivity* 6.4E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: Red Fat Clay with Sand

USCS (ASTM D2487:2488): CH

REMARKS: Material passed #4 sieve used for testing. Material was remolded to 99.9% of maximum dry density (standard proctor) at 3.5% above optimum moisture content.

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

of NORTH CAROLINA, PLLC

SECTION F-2

Laboratory Test Pad Shelby Tube 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 (TPST-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 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
10496	TPST-1	-	-	-	-	-	-	-	-	-	-	32.8	88.9	5.3E-08
10497	TPST-2	-	-	-	-	-	-	-	-	-	-	32.5	90.9	7.5E-08
10498	TPST-3	-	-	-	-	-	-	-	-	-	-	35.0	87.3	4.3E-08
10527	TPST-4	-	-	-	-	-	-	-	-	-	-	35.1	86.2	9.7E-08

TIMELY ENGINEERING SOIL TESTS, LLC

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

AASHTO R18

Tested By	VG
Date	11/10/10
Checked By	VG

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	UD
Sample ID	10496/TPST-1	Depth/Elev.	-
Location	-	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	3.057	in	7.76	cm
Diameter	2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2
Volume	320.70	cm^3	0.0113	ft^3
Mass	606.70	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.9	pcf		

Moisture Content

Mass of wet sample & tare	606.70	g
Mass of dry sample & tare	456.80	g
Mass of tare	0.00	g
% Moisture	32.8	

Test Data

Speed	12	
Board Number	3	
Cell Number	7	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	196.25	cm
Min Head	196.25	cm
Maximum Gradient	25.27	
Minimum Gradient	25.27	

Final Data (After Test)

Average Height of Sample			3.058	in	7.77	cm
Average Diameter of Sample			2.845	in	7.23	cm
Area	6.36	in^2	41.01	cm^2		
Volume	318.56	cm^3	0.0112	ft^3		
Mass	610.90	g	1.35	lb		

Dry Density	89.5	pcf
Vol. of Voids	152.34	cm^3
Vol. of Solids	166.22	cm^3
Void Ratio	0.92	
Saturation	101.0	%

Moisture Content

Mass of wet sample & tare	673.80	g
Mass of dry sample & tare	520.10	g
Mass of tare	63.30	g
% Moisture	33.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/10/10	18	30	-	2.79	196.25	25.27	20.7	-	-	-	
11/10/10	18	35	300	2.79	196.25	25.27	20.7	5.40E-08	0.983	5.31E-08	
11/10/10	18	40	300	2.79	196.25	25.27	20.7	5.40E-08	0.983	5.31E-08	
11/10/10	18	45	300	2.79	196.25	25.27	20.7	5.40E-08	0.983	5.31E-08	*
11/10/10	18	50	300	2.79	196.25	25.27	20.7	5.40E-08	0.983	5.31E-08	*
11/10/10	18	55	300	2.79	196.25	25.27	20.7	5.40E-08	0.983	5.31E-08	*
11/10/10	19	0	300	2.79	196.25	25.27	20.7	5.40E-08	0.983	5.31E-08	*

Reported Average Hydraulic Conductivity* 5.3E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAR AASHTO R18

Tested By	VG
Date	11/10/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	UD
Sample ID	10497/TPST-2	Depth/Elev.	-
Location	-	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	3.044	in	7.73	cm
Diameter	2.841	in	7.22	cm
Area	6.34	in^2	40.90	cm^2
Volume	316.21	cm^3	0.0112	ft^3
Mass	610.30	g	1.35	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	90.9	pcf		

Moisture Content

Mass of wet sample & tare	610.30	g
Mass of dry sample & tare	460.50	g
Mass of tare	0.00	g
% Moisture	32.5	

Test Data

Speed	12	
Board Number	4	
Cell Number	4	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	139.27	cm
Min Head	139.27	cm
Maximum Gradient	18.05	
Minimum Gradient	18.05	

Final Data (After Test)

Average Height of Sample			3.037	in	7.71	cm
Average Diameter of Sample			2.833	in	7.20	cm
Area	6.30	in^2	40.67	cm^2		
Volume	313.71	cm^3	0.0111	ft^3		
Mass	613.40	g	1.35	lb		

Dry Density	91.7	pcf
Vol. of Voids	146.12	cm^3
Vol. of Solids	167.59	cm^3
Void Ratio	0.87	
Saturation	104.4	%

Moisture Content

Mass of wet sample & tare	824.50	g
Mass of dry sample & tare	672.10	g
Mass of tare	211.60	g
% Moisture	33.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/10/10	18	30	-	1.98	139.27	18.05	20.7	-	-	-	
11/10/10	18	35	300	1.98	139.27	18.05	20.7	7.63E-08	0.983	7.50E-08	
11/10/10	18	40	300	1.98	139.27	18.05	20.7	7.63E-08	0.983	7.50E-08	
11/10/10	18	45	300	1.98	139.27	18.05	20.7	7.63E-08	0.983	7.50E-08	*
11/10/10	18	50	300	1.98	139.27	18.05	20.7	7.63E-08	0.983	7.50E-08	*
11/10/10	18	55	300	1.98	139.27	18.05	20.7	7.63E-08	0.983	7.50E-08	*
11/10/10	19	0	300	1.98	139.27	18.05	20.7	7.63E-08	0.983	7.50E-08	*

Reported Average Hydraulic Conductivity* 7.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO R18

Tested By	VG
Date	11/11/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	UD
Sample ID	10498/TPST-3	Depth/Elev.	-
Location	-	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	3.052	in	7.75	cm
Diameter	2.843	in	7.22	cm
Area	6.35	in^2	40.96	cm^2
Volume	317.49	cm^3	0.0112	ft^3
Mass	599.40	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.3	pcf		

Moisture Content

Mass of wet sample & tare	599.40	g
Mass of dry sample & tare	444.00	g
Mass of tare	0.00	g
% Moisture	35.0	

Test Data

Speed	13	
Board Number	11	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	125.21	cm
Min Head	124.50	cm
Maximum Gradient	16.15	
Minimum Gradient	16.06	

Final Data (After Test)

Average Height of Sample			3.053	in	7.75	cm
Average Diameter of Sample			2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2		
Volume	318.94	cm^3	0.0113	ft^3		
Mass	606.60	g	1.34	lb		

Dry Density	86.9	pcf
Vol. of Voids	157.45	cm^3
Vol. of Solids	161.48	cm^3
Void Ratio	0.98	
Saturation	103.2	%

Moisture Content

Mass of wet sample & tare	703.50	g
Mass of dry sample & tare	541.00	g
Mass of tare	97.00	g
% Moisture	36.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/11/10	9	5	-	1.77	124.50	16.06	19.6	-	-	-	
11/11/10	9	10	300	1.78	125.21	16.15	19.6	4.23E-08	1.010	4.27E-08	
11/11/10	9	15	300	1.77	124.50	16.06	19.6	4.23E-08	1.010	4.27E-08	
11/11/10	9	20	300	1.77	124.50	16.06	19.6	4.24E-08	1.010	4.28E-08	*
11/11/10	9	25	300	1.77	124.50	16.06	19.6	4.24E-08	1.010	4.28E-08	*
11/11/10	9	30	300	1.77	124.50	16.06	19.6	4.24E-08	1.010	4.28E-08	*
11/11/10	9	35	300	1.77	124.50	16.06	19.6	4.24E-08	1.010	4.28E-08	*

Reported Average Hydraulic Conductivity* 4.3E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	140			Pore Pressure Transducer ID #	28

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

AASHTO R18

Tested By	VG
Date	11/12/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	UD
Sample ID	10527/TPST-4	Depth/Elev.	-
Location	-	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	3.047	in	7.74	cm
Diameter	2.823	in	7.17	cm
Area	6.26	in^2	40.38	cm^2
Volume	312.53	cm^3	0.0110	ft^3
Mass	583.40	g	1.29	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.2	pcf		

Moisture Content

Mass of wet sample & tare	583.40	g
Mass of dry sample & tare	431.83	g
Mass of tare	0.00	g
% Moisture	35.1	

Test Data

Speed	13	
Board Number	3	
Cell Number	5	
Flow Pump Number	1B	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	55.57	cm
Min Head	54.16	cm
Maximum Gradient	7.10	
Minimum Gradient	6.92	

Final Data (After Test)

Average Height of Sample			3.080	in	7.82	cm
Average Diameter of Sample			2.860	in	7.26	cm
Area	6.42	in^2	41.45	cm^2		
Volume	324.25	cm^3	0.0115	ft^3		
Mass	607.80	g	1.34	lb		

Dry Density	83.2	pcf
Vol. of Voids	167.01	cm^3
Vol. of Solids	157.24	cm^3
Void Ratio	1.06	
Saturation	105.0	%

Moisture Content

Mass of wet sample & tare	731.17	g
Mass of dry sample & tare	556.00	g
Mass of tare	124.17	g
% Moisture	40.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/12/10	17	40	-	0.78	54.87	7.01	20.1	-	-	-	
11/12/10	17	45	300	0.79	55.57	7.10	20.1	9.57E-08	0.998	9.55E-08	
11/12/10	17	50	300	0.78	54.87	7.01	20.1	9.57E-08	0.998	9.55E-08	
11/12/10	17	55	300	0.77	54.16	6.92	20.1	9.70E-08	0.998	9.67E-08	*
11/12/10	18	0	300	0.78	54.87	7.01	20.1	9.70E-08	0.998	9.67E-08	*
11/12/10	18	5	300	0.77	54.16	6.92	20.1	9.70E-08	0.998	9.67E-08	*
11/12/10	18	10	300	0.78	54.87	7.01	20.1	9.70E-08	0.998	9.67E-08	*

Reported Average Hydraulic Conductivity* 9.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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SECTION F-3

Test Pad Field Density Test Results

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: S

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
TP-1	11/9	N	L-1	N	87.3	36.9	PC-2	88.7	32.4	98.4	+4.5	P	
		E											
TP-2		N			85.4	36.1	PC-5	85.5	32.2	99.9	+3.9	P	
		E											
TP-3		N			87.7	36.3	PC-2	88.7	32.4	98.9	+3.9	P	
		E											
TP-4		N	L-2		87.3	35.6				98.4	+3.2	P	
		E											
TP-5		N			87.3	35.5				98.4	+3.1	P	
		E											
TP-6		N			87.5	35.6				98.6	+3.2	P	
		E											
TP-7		N	L-3		83.2	38.9	PC-6	84.8	34.8	98.1	+4.1	P	
		E											
TP-8		N			87.7	35.7	PC-2	88.7	32.4	98.9	+3.3	P	
		E											
TP-9		N			87.2	36.0				98.3	+3.6	P	
		E											
TP-10		N	L-4		87.4	35.5				98.5	+3.1	P	
		E											
TP-11		N			87.2	35.9				98.3	+3.5	P	
		E											
TP-12		N			83.3	38.7	PC-6	84.8	34.8	98.2	+3.9	P	
		E											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

Final Certification Report

Construction Quality Assurance Services

Cell 2I Construction
Charlotte Motor Speedway Landfill V
Cabarrus County, North Carolina

Volume II

Prepared For:

BFI Waste Systems of North America, Inc.
Charlotte Motor Speedway Landfill V
5105 Moreland Road
Concord, North Carolina 28027

Prepared by:

ACC of NORTH CAROLINA, PLLC

February 2011

of NORTH CAROLINA, PLLC

APPENDIX G
Construction Testing

of NORTH CAROLINA, PLLC

SECTION G-1

Laboratory Bulk Sample 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 (CC-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 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
10646	CC-1	-	32.6	99.9	79.4	57.3	68	35	33	30.5	91.0	-	-	-
10647	CC-2	-	31.5	99.8	78.8	59.0	64	32	32	28.7	92.2	-	-	-
10648	CC-3	-	34.1	99.0	82.3	59.5	68	36	32	30.9	91.2	-	-	-
10649	CC-4	-	33.9	99.7	82.3	62.4	74	36	38	32.4	88.8	-	-	-
10650	CC-5	-	32.0	99.8	81.8	61.2	66	34	32	31.0	89.7	-	-	-
10651	CC-6	-	36.4	99.9	84.0	61.0	72	37	35	35.5	85.7	-	-	-
10652	CC-7	-	34.1	99.6	83.9	62.8	69	38	31	33.2	87.2	-	-	-
10653	CC-8	-	36.1	99.9	84.1	59.1	73	39	34	34.0	85.3	-	-	-

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	NK
		Date	11/3
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10646/CC-1	Depth/Elev.	-
Location	Lift 1	Add. Info	-

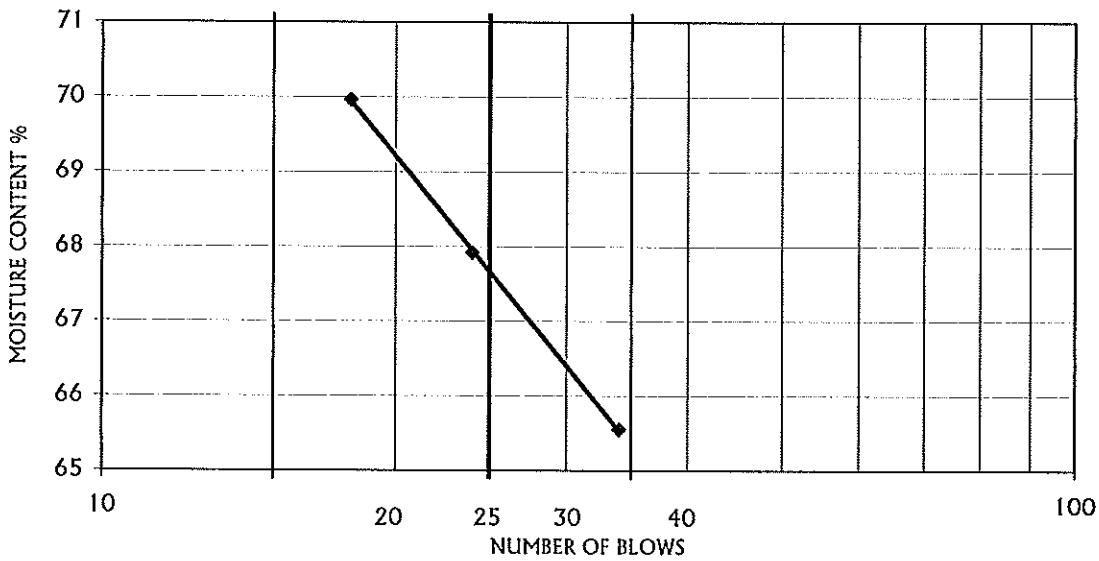
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	34	24	18
Mass of Wet Sample & Tare, g	38.32	37.38	38.70
Mass of Dry Sample & Tare, g	33.43	30.65	33.39
Mass of Tare, g	25.97	20.74	25.80
Moisture Content, %	65.55	67.91	69.96

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	30.55	30.95
Mass of Dry Sample & Tare, g	27.87	28.33
Mass of Tare, g	20.16	20.76
Moisture Content, %	34.76	34.61

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	962.50
Mass of Dry Sample & Tare, g	805.50
Mass of Tare, g	324.10
Moisture Content, %	32.61

LIQUID LIMIT (LL)	68
PLASTIC LIMIT (PL)	35
PLASTICITY INDEX (PI)	33
LIQUIDITY INDEX (LI)	-0.07

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

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	11/29/10
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10646/CC-1	Depth/Elev.	-
Location	Lift 1	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	962.50
Mass of Dry Sample & Tare, g	805.50
Mass of Tare, g	324.10
Moisture Content, %	32.6

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	284.10
Mass of Dry Sample & Tare, g	249.60
Mass of Tare, g	61.20
Moisture Content, %	18.3

Mass of Total Sample before separation on #4 sieve & Tare, g	18557.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	15684.79

Mass of Sample used for hydrometer analysis, g	71.50
Dry Mass, g	60.43
% of Total Sample passing #4 sieve	99.9

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL	0.00	0.0	100.0
.5"		5.17	0.0	100.0
.375"		7.75	0.0	100.0
#4	COARSE SAND	20.87	0.1	99.9

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.24	99.5
#20		1.09	98.1
#40	FINE SAND	2.64	95.5
#60		4.98	91.6
#100		7.08	88.2
#200	FINES	12.36	79.4

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:40

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	4.0
% COARSE GRAVEL	0.0	% FINE SAND	16.1
% FINE GRAVEL	0.1	% FINES	79.4
% COARSE SAND	0.4	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	57.3	% CLAY(<0.002mm)	50.2

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:42	2	51.5	18.5	0.01361	6.5	45.0	8.9	0.99	0.0287	73.6
11/30/10	14:45	5	49.0	18.5	0.01361	6.5	42.5	9.3	0.99	0.0186	69.5
11/30/10	14:55	15	46.0	18.5	0.01361	6.5	39.5	9.8	0.99	0.0110	64.6
11/30/10	15:10	30	45.0	18.5	0.01361	6.5	38.5	10.0	0.99	0.0079	63.0
11/30/10	15:40	60	42.5	18.5	0.01361	6.5	36.0	10.4	0.99	0.0057	58.9
11/30/10	18:50	250	38.5	18.5	0.01361	6.5	32.0	11.1	0.99	0.0029	52.4
12/01/10	14:40	1440	36.0	18.5	0.01361	6.5	29.5	11.5	0.99	0.0012	48.3

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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Web: www.test-llc.com

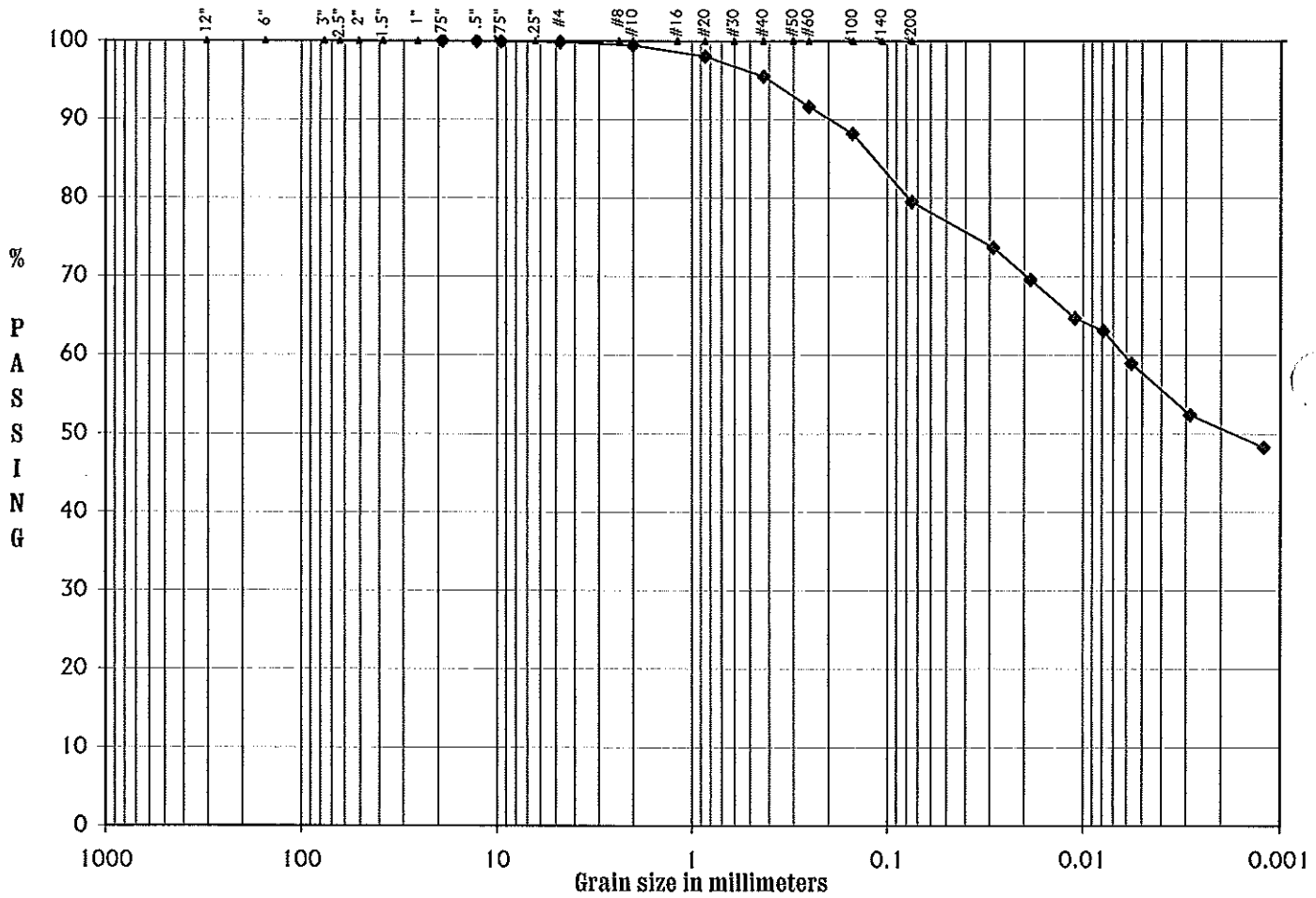
AASHTO R18

Tested By	RI
Date	
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10646/CC-1	Depth/Elev.	-
Location	Lift 1	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

DESCRIPTION: NA

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

USCS (ASTM D2487; D2488): NA

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AASHTO R18

Tested By	RI
Date	11/26/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10646/CC-1	Depth/Elev.	-
Location	Lift 1	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	20800.0	15684.7
Mass of Mat. Retained on No. 4 sieve, g	20.9	20.9
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.1
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.1

MOISTURE CONTENT

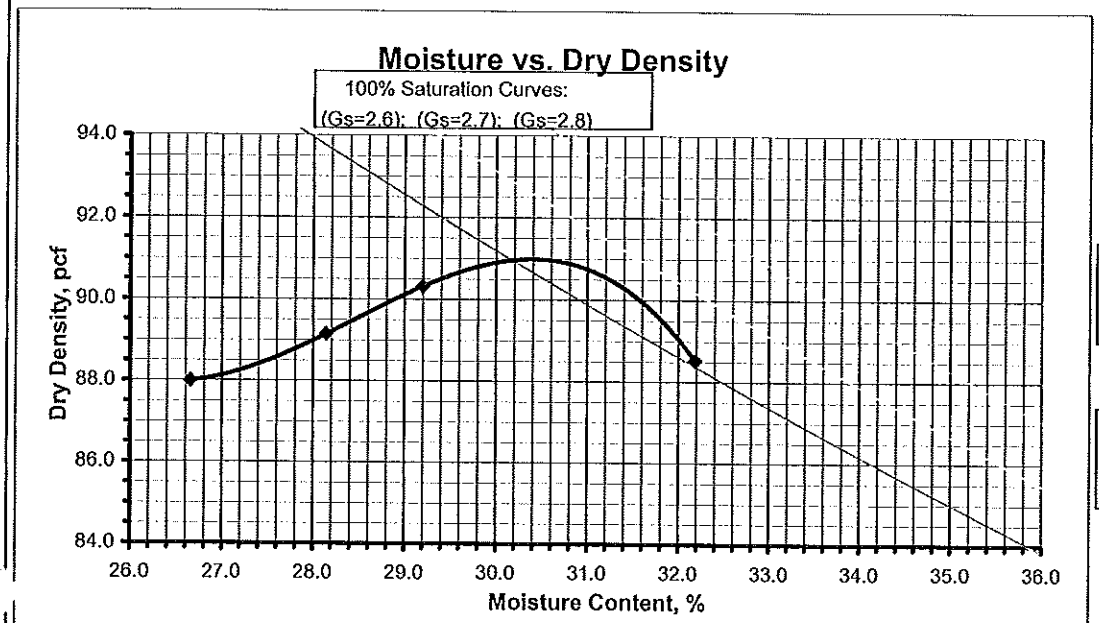
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	962.5	20.9
Mass of Dry Sample & Tare, g	805.5	20.9
Mass of Tare, g	324.1	0.0
Moisture Content, %	32.6	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5934.0	5976.0	6013.0	6018.0	
Mass of Wet Sample & Tare, g	418.0	528.5	528.5	427.0	
Mass of Dry Sample & Tare, g	345.5	446.8	432.0	340.2	
Mass of Tare, g	73.5	156.5	101.5	70.5	
Moisture Content, %	26.7	28.1	29.2	32.2	
Wet Density, pcf	111.5	114.2	116.7	117.0	
Dry Density, pcf	88.0	89.1	90.3	88.5	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	91.0	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	30.5	**Corrected Optimum Moisture Content, %**	NA

TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO #18	Tested By: NK Date: 11/3 Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10647/CC-2	Depth/Elev.	-
Location	Lift 1	Add. Info	-

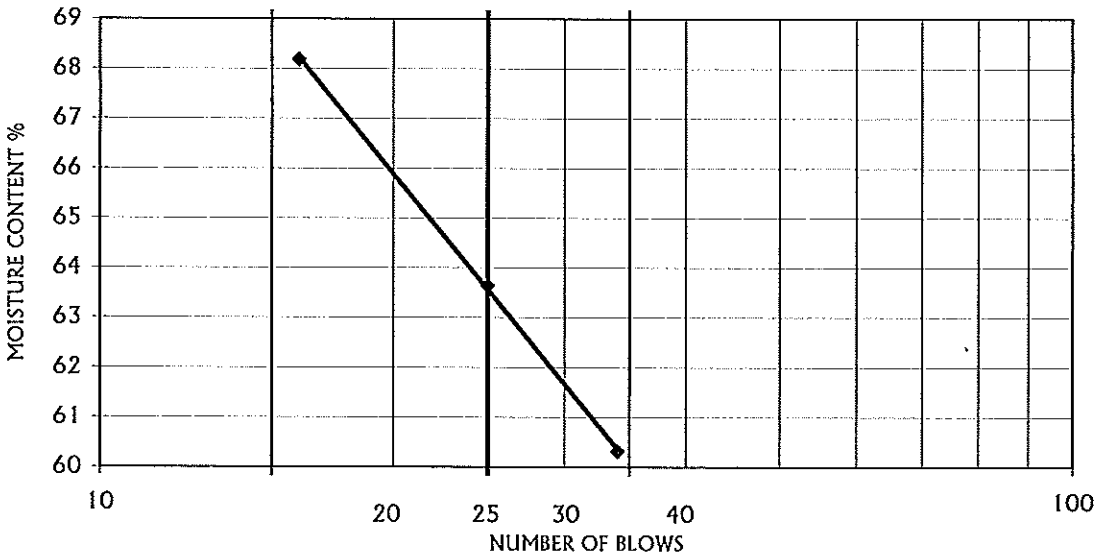
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	34	25	16
Mass of Wet Sample & Tare, g	37.58	40.37	43.33
Mass of Dry Sample & Tare, g	32.49	34.14	35.83
Mass of Tare, g	24.05	24.35	24.83
Moisture Content, %	60.31	63.64	68.18

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	33.40	30.27
Mass of Dry Sample & Tare, g	30.60	27.77
Mass of Tare, g	21.76	19.86
Moisture Content, %	31.67	31.61

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	926.40
Mass of Dry Sample & Tare, g	779.80
Mass of Tare, g	314.30
Moisture Content, %	31.49

LIQUID LIMIT (LL)	64
PLASTIC LIMIT (PL)	32
PLASTICITY INDEX (PI)	32
LIQUIDITY INDEX (LI)	-0.02

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

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AAP® AASHTO R18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10647/CC-2	Depth/Elev.	-
Location	Lift 1	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	926.40
Mass of Dry Sample & Tare, g	779.80
Mass of Tare, g	314.30
Moisture Content, %	31.5

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	298.90
Mass of Dry Sample & Tare, g	265.60
Mass of Tare, g	60.90
Moisture Content, %	16.3

Mass of Total Sample before separation on #4 sieve & Tare, g	20249.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	17415.84

Mass of Sample used for hydrometer analysis, g	71.30
Dry Mass, g	61.32
% of Total Sample passing #4 sieve	99.8

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL	0.00	0.0	100.0
.5"		17.37	0.1	99.9
.375"		18.58	0.1	99.9
#4	COARSE SAND	32.04	0.2	99.8

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.30	99.3
#20		1.45	97.5
#40	FINE SAND	2.83	95.2
#60		5.41	91.0
#100		8.78	85.5
#200	FINES	12.92	78.8

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:42

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	4.1
% COARSE GRAVEL	0.0	% FINE SAND	16.4
% FINE GRAVEL	0.2	% FINES	78.8
% COARSE SAND	0.5	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	59.0	% CLAY(<0.002mm)	51.5

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:44	2	51.5	18.5	0.01361	6.5	45.0	8.9	0.99	0.0287	72.5
11/30/10	14:47	5	49.5	18.5	0.01361	6.5	43.0	9.2	0.99	0.0185	69.3
11/30/10	14:57	15	47.5	18.5	0.01361	6.5	41.0	9.6	0.99	0.0109	66.1
11/30/10	15:12	30	46.0	18.5	0.01361	6.5	39.5	9.8	0.99	0.0078	63.7
11/30/10	15:42	60	44.0	18.5	0.01361	6.5	37.5	10.2	0.99	0.0056	60.4
11/30/10	18:52	250	40.0	18.5	0.01361	6.5	33.5	10.8	0.99	0.0028	54.0
12/01/10	14:42	1440	37.0	18.5	0.01361	6.5	30.5	11.3	0.99	0.0012	49.1

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

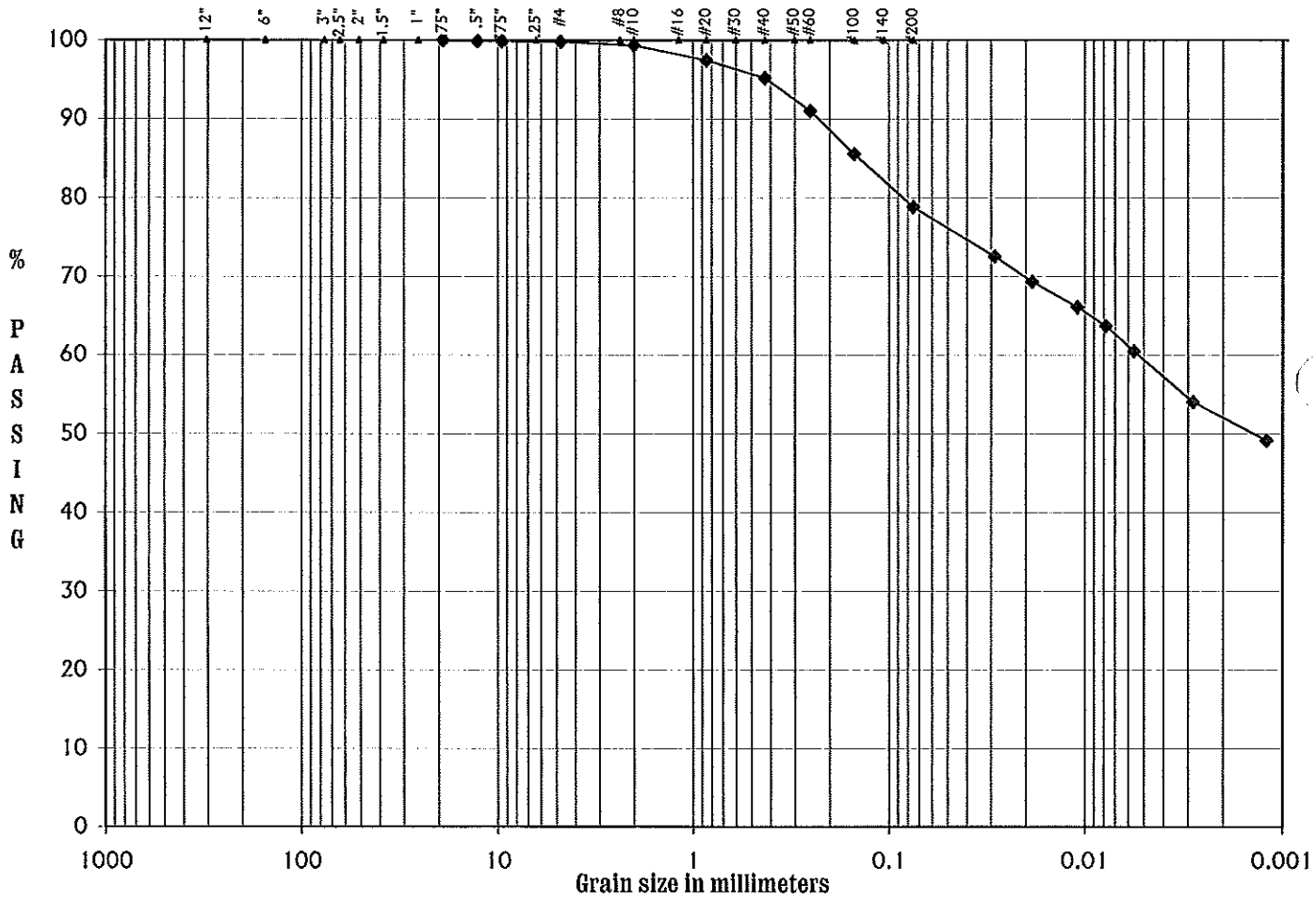
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: RI Date: Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10647/CC-2	Depth/Elev.	-
Location	Lift 1	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

DESCRIPTION: NA

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

USCS (ASTM D2487; D2488): NA

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AASHTO R18

Tested By	RI
Date	11/26/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10647/CC-2	Depth/Elev.	-
Location	Lift 1	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	22900.0	17415.4
Mass of Mat. Retained on No. 4 sieve, g	32.0	32.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.2
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.2

MOISTURE CONTENT

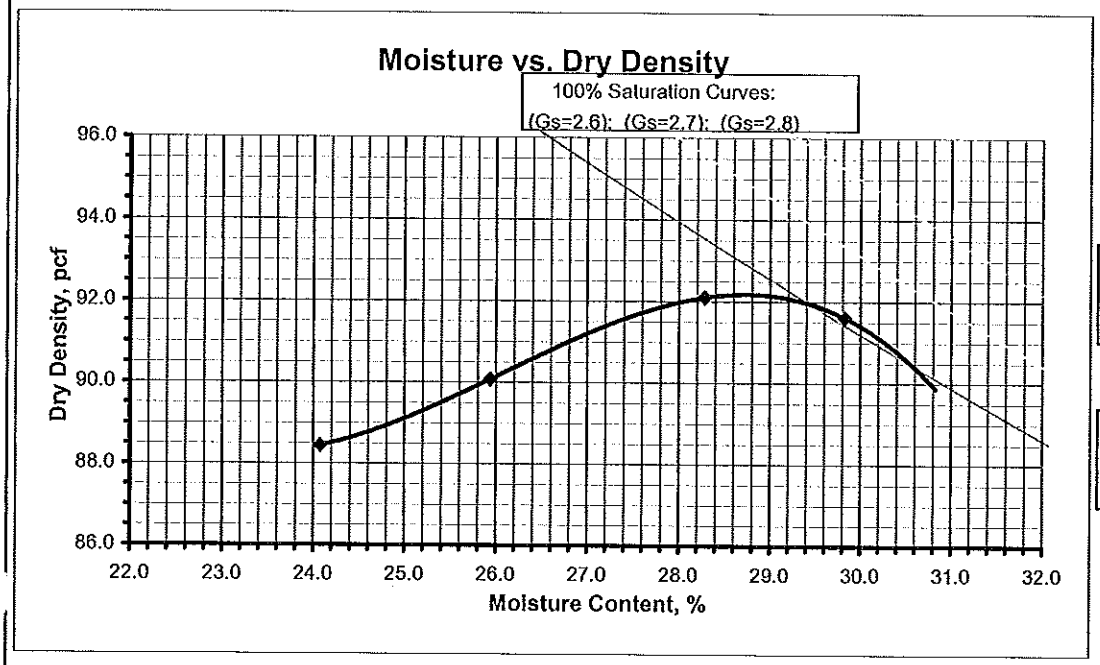
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	926.4	32.0
Mass of Dry Sample & Tare, g	779.8	32.0
Mass of Tare, g	314.3	0.0
Moisture Content, %	31.5	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5908.0	5964.0	6035.0	6047.0	
Mass of Wet Sample & Tare, g	408.0	522.0	420.0	343.5	
Mass of Dry Sample & Tare, g	343.0	446.0	343.5	282.5	
Mass of Tare, g	73.0	153.0	73.0	78.0	
Moisture Content, %	24.1	25.9	28.3	29.8	
Wet Density, pcf	109.7	113.4	118.1	118.9	
Dry Density, pcf	88.4	90.1	92.1	91.6	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	92.2	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	28.7	**Corrected Optimum Moisture Content, %**	NA

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		Date	11/30
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10648/CC-3	Depth/Elev.	-
Location	Lift 2	Add. Info	-

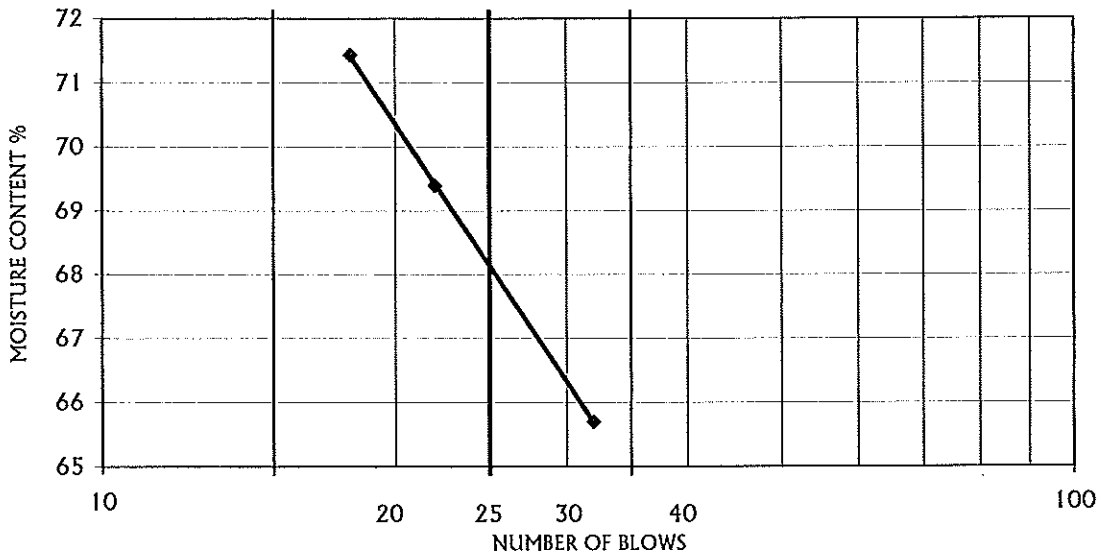
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	32	22	18
Mass of Wet Sample & Tare, g	37.25	39.76	40.28
Mass of Dry Sample & Tare, g	31.62	34.32	33.88
Mass of Tare, g	23.05	26.48	24.92
Moisture Content, %	65.69	69.39	71.43

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	28.38	30.86
Mass of Dry Sample & Tare, g	26.00	28.17
Mass of Tare, g	19.30	20.60
Moisture Content, %	35.52	35.54

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	844.30
Mass of Dry Sample & Tare, g	669.30
Mass of Tare, g	155.80
Moisture Content, %	34.08

LIQUID LIMIT (LL)	68
PLASTIC LIMIT (PL)	36
PLASTICITY INDEX (PI)	32
LIQUIDITY INDEX (LI)	-0.06

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AAP® AASHTO R18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10648/CC-3	Depth/Elev.	-
Location	Lift 2	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	844.30
Mass of Dry Sample & Tare, g	669.30
Mass of Tare, g	155.80
Moisture Content, %	34.1

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	259.70
Mass of Dry Sample & Tare, g	227.30
Mass of Tare, g	60.10
Moisture Content, %	19.4

Mass of Total Sample before separation on #4 sieve & Tare, g	20800.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	17423.65

Mass of Sample used for hydrometer analysis, g	71.00
Dry Mass, g	59.47
% of Total Sample passing #4 sieve	99.0

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"		0.00	0.0	100.0
1.5"		166.47	1.0	99.0
1"		166.47	1.0	99.0
.75"	FINE GRAVEL	166.47	1.0	99.0
.5"		166.47	1.0	99.0
.375"		172.85	1.0	99.0
#4	COARSE SAND	174.36	1.0	99.0

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.50	98.2
#20		1.35	96.8
#40	FINE SAND	2.53	94.8
#60		4.23	92.0
#100		6.83	87.6
#200	FINES	10.03	82.3

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:44

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	3.4
% COARSE GRAVEL	1.0	% FINE SAND	12.5
% FINE GRAVEL	0.0	% FINES	82.3
% COARSE SAND	0.8	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	59.5	% CLAY(<0.002mm)	52.3

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:46	2	53.0	18.5	0.01361	6.5	46.5	8.7	0.99	0.0283	76.6
11/30/10	14:49	5	50.0	18.5	0.01361	6.5	43.5	9.2	0.99	0.0184	71.7
11/30/10	14:59	15	47.5	18.5	0.01361	6.5	41.0	9.6	0.99	0.0109	67.6
11/30/10	15:14	30	46.0	18.5	0.01361	6.5	39.5	9.8	0.99	0.0078	65.1
11/30/10	15:44	60	43.5	18.5	0.01361	6.5	37.0	10.2	0.99	0.0056	61.0
11/30/10	18:54	250	39.5	18.5	0.01361	6.5	33.0	10.9	0.99	0.0028	54.4
12/01/10	14:44	1440	37.0	18.5	0.01361	6.5	30.5	11.3	0.99	0.0012	50.3

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

TIMELY ENGINEERING SOIL TESTS, LLC

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Fax: 770-923-8973

Web: www.test-llc.com

AASHTO R18

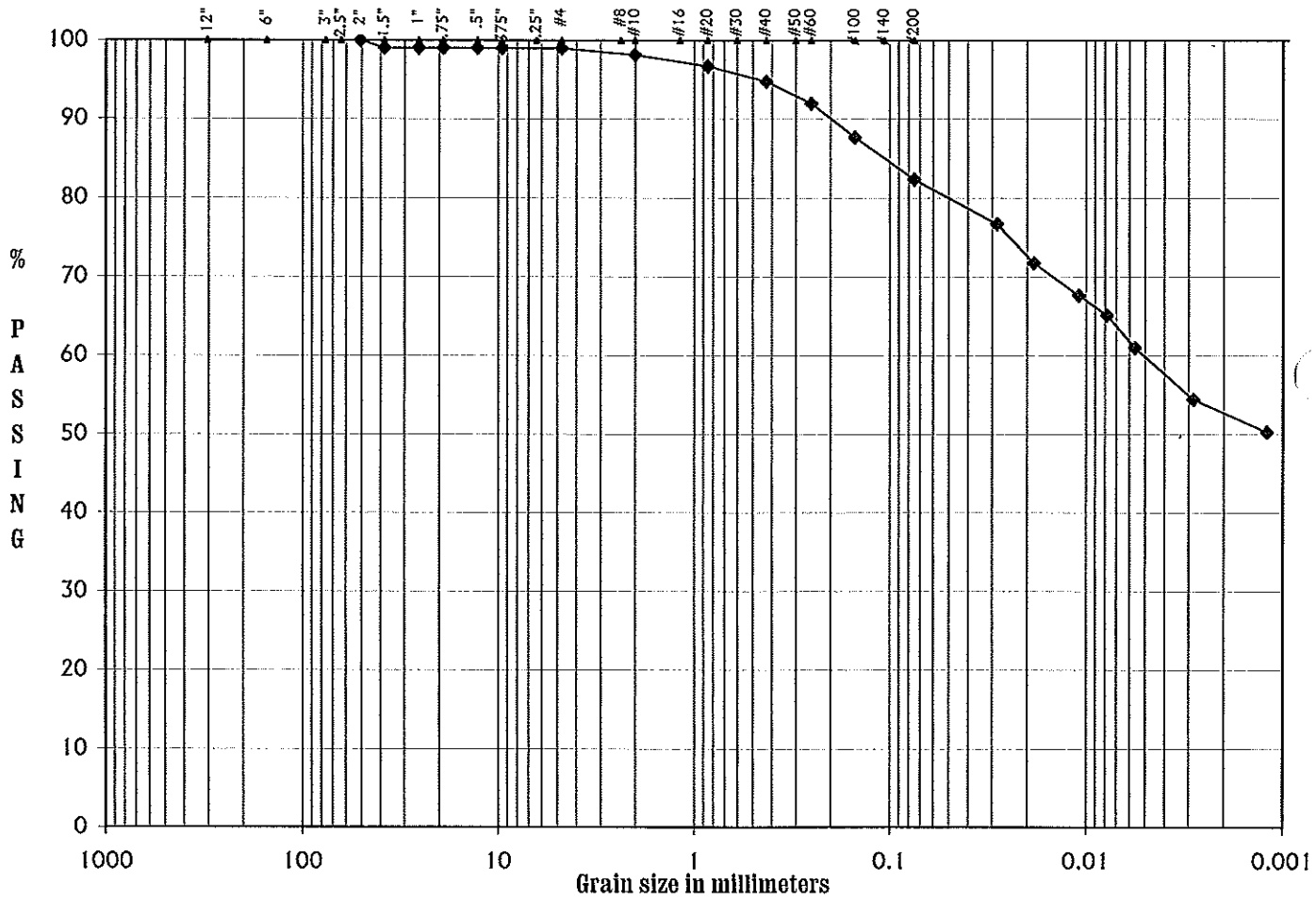
Tested By	RI
Date	1(
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10648/CC-3	Depth/Elev.	-
Location	Lift 2	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

DESCRIPTION: NA

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

USCS (ASTM D2487; D2488): NA

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AAP AASHTO R18

Tested By	RI
Date	11/26/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10648/CC-3	Depth/Elev.	-
Location	Lift 2	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	20800.0	15513.1
Mass of Mat. Retained on No. 4 sieve, g	174.4	174.4
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	1.1
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	1.1

MOISTURE CONTENT

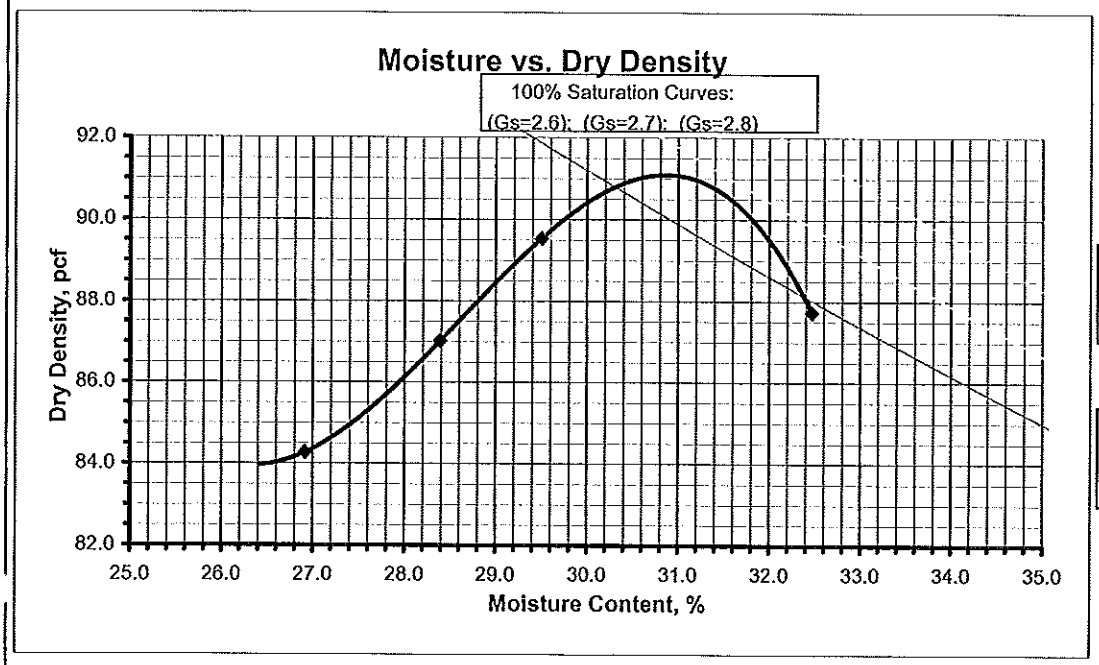
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	844.3	174.4
Mass of Dry Sample & Tare, g	669.3	174.4
Mass of Tare, g	155.8	0.0
Moisture Content, %	34.1	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5866.0	5938.0	6002.0	6006.0	
Mass of Wet Sample & Tare, g	421.5	519.0	501.5	400.0	
Mass of Dry Sample & Tare, g	335.5	438.4	419.6	306.0	
Mass of Tare, g	16.0	154.5	142.0	16.5	
Moisture Content, %	26.9	28.4	29.5	32.5	
Wet Density, pcf	107.0	111.7	116.0	116.2	
Dry Density, pcf	84.3	87.0	89.5	87.7	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	91.2	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	30.9	**Corrected Optimum Moisture Content, %**	NA

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	NK/IN
		Date	11/3
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10649/CC-4	Depth/Elev.	-
Location	Lift 2	Add. Info	-

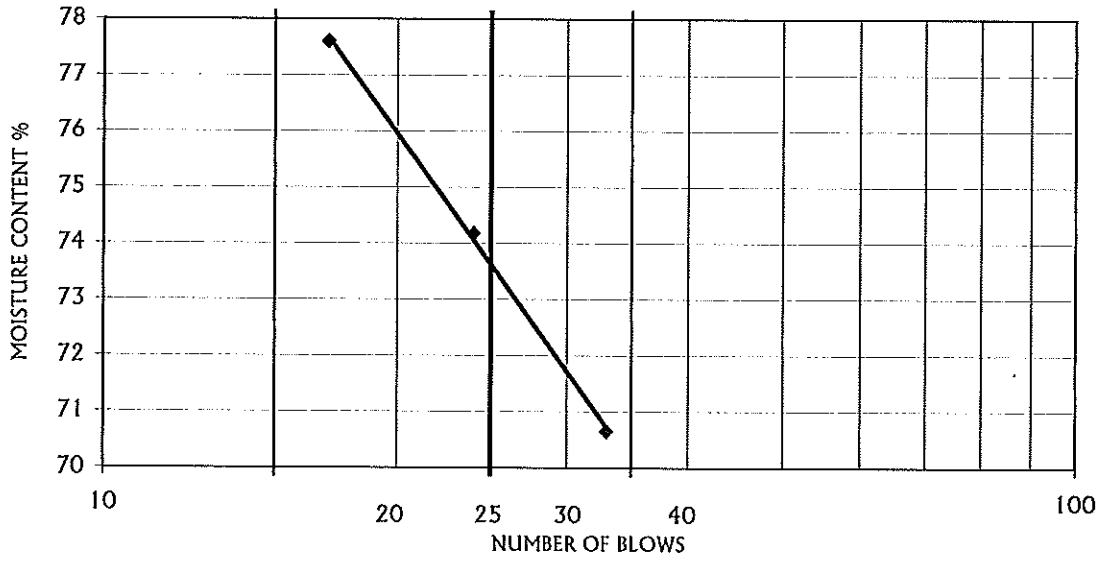
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	33	24	17
Mass of Wet Sample & Tare, g	40.18	40.11	40.60
Mass of Dry Sample & Tare, g	34.50	33.59	33.74
Mass of Tare, g	26.46	24.80	24.90
Moisture Content, %	70.65	74.18	77.60

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	28.17	30.49
Mass of Dry Sample & Tare, g	24.97	28.00
Mass of Tare, g	16.18	21.06
Moisture Content, %	36.41	35.88

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	797.80
Mass of Dry Sample & Tare, g	636.60
Mass of Tare, g	161.40
Moisture Content, %	33.92

LIQUID LIMIT (LL)	74
PLASTIC LIMIT (PL)	36
PLASTICITY INDEX (PI)	38
LIQUIDITY INDEX (LI)	-0.05

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

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AAP AASHTO R18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10649/CC-4	Depth/Elev.	-
Location	Lift 2	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	797.80
Mass of Dry Sample & Tare, g	636.60
Mass of Tare, g	161.40
Moisture Content, %	33.9

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	275.80
Mass of Dry Sample & Tare, g	237.30
Mass of Tare, g	59.40
Moisture Content, %	21.6

Mass of Total Sample before separation on #4 sieve & Tare, g	22800.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	18743.62

Mass of Sample used for hydrometer analysis, g	71.50
Dry Mass, g	58.78
% of Total Sample passing #4 sieve	99.7

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"			0.0	100.0
2.5"	COARSE GRAVEL		0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"		0.00	0.0	100.0
.75"		14.72	0.1	99.9
.5"	FINE GRAVEL	26.57	0.1	99.9
.375"		41.30	0.2	99.8
#4	COARSE SAND	57.18	0.3	99.7

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.41	99.0
#20		1.27	97.5
#40	FINE SAND	2.37	95.7
#60		4.37	92.3
#100		6.91	88.0
#200	FINES	10.23	82.3

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:46

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	3.3
% COARSE GRAVEL	0.1	% FINE SAND	13.3
% FINE GRAVEL	0.2	% FINES	82.3
% COARSE SAND	0.7	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	62.4	% CLAY(<0.002mm)	55.0

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:48	2	52.5	18.5	0.01361	6.5	46.0	8.7	0.99	0.0285	77.2
11/30/10	14:51	5	50.5	18.5	0.01361	6.5	44.0	9.1	0.99	0.0183	73.9
11/30/10	15:01	15	48.0	18.5	0.01361	6.5	41.5	9.5	0.99	0.0108	69.7
11/30/10	15:16	30	46.0	18.5	0.01361	6.5	39.5	9.8	0.99	0.0078	66.3
11/30/10	15:46	60	44.5	18.5	0.01361	6.5	38.0	10.1	0.99	0.0056	63.8
11/30/10	18:56	250	40.5	18.5	0.01361	6.5	34.0	10.7	0.99	0.0028	57.1
12/01/10	14:46	1440	38.0	18.5	0.01361	6.5	31.5	11.2	0.99	0.0012	52.9

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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AASHTO R18

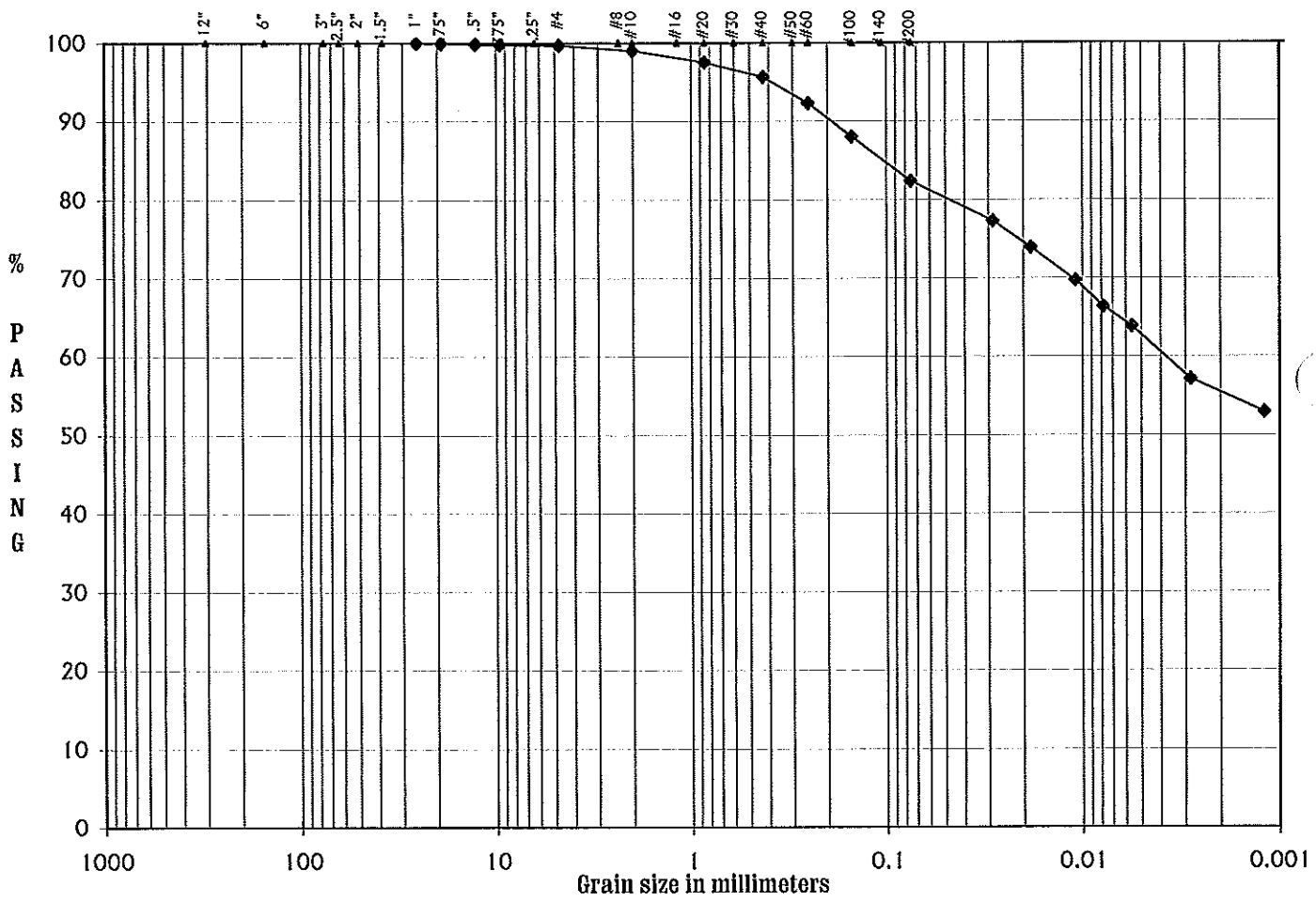
Tested By	RI
Date	1
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10649/CC-4	Depth/Elev.	-
Location	Lift 2	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

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AAP AASHTO R18

Tested By	RI
Date	11/26/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10649/CC-4	Depth/Elev.	-
Location	Lift 2	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	22800.0	17024.8
Mass of Mat. Retained on No. 4 sieve, g	57.2	57.2
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.3
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.3

MOISTURE CONTENT

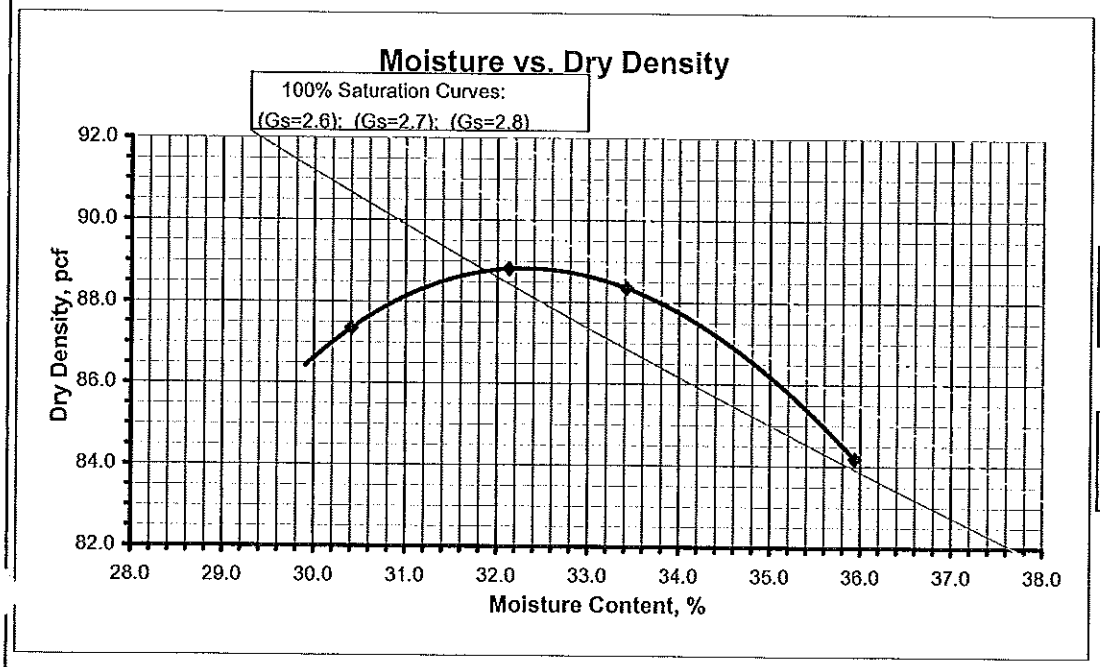
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	797.8	57.2
Mass of Dry Sample & Tare, g	636.6	57.2
Mass of Tare, g	161.4	0.0
Moisture Content, %	33.9	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5971.0	6023.0	6031.0	5979.0	
Mass of Wet Sample & Tare, g	426.5	521.5	422.0	704.5	
Mass of Dry Sample & Tare, g	330.9	432.5	320.3	601.0	
Mass of Tare, g	16.5	155.5	16.0	313.0	
Moisture Content, %	30.4	32.1	33.4	35.9	
Wet Density, pcf	113.9	117.3	117.9	114.4	
Dry Density, pcf	87.3	88.8	88.3	84.2	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	88.8	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	32.4	**Corrected Optimum Moisture Content, %**	NA

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		Date	11/30
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10650/CC-5	Depth/Elev.	-
Location	Lift 3	Add. Info	-

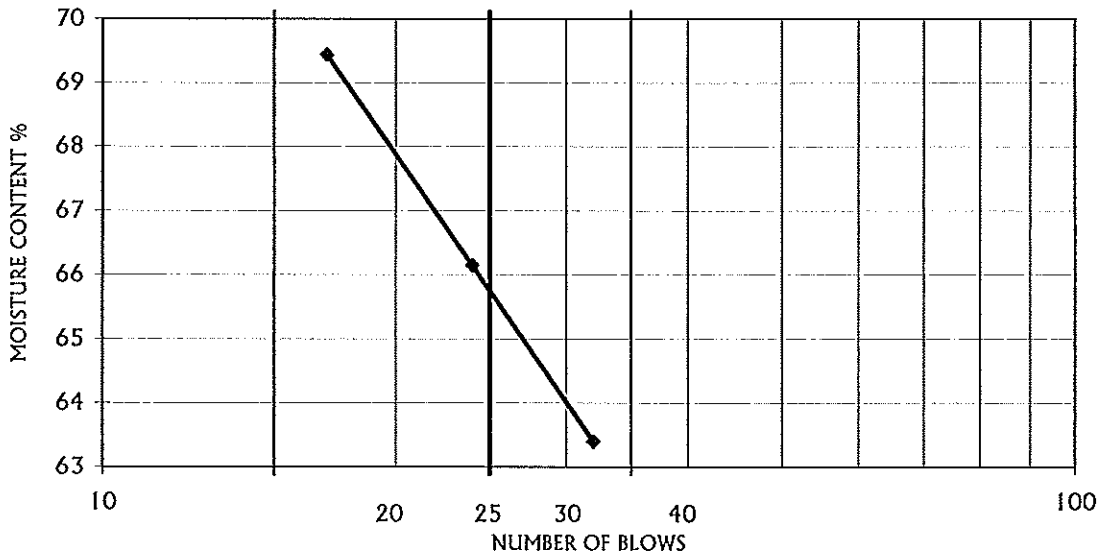
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	32	24	17
Mass of Wet Sample & Tare, g	43.10	36.02	38.43
Mass of Dry Sample & Tare, g	37.09	30.57	32.32
Mass of Tare, g	27.61	22.33	23.52
Moisture Content, %	63.40	66.14	69.43

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	29.87	30.11
Mass of Dry Sample & Tare, g	27.17	27.31
Mass of Tare, g	19.28	19.18
Moisture Content, %	34.22	34.44

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	692.60
Mass of Dry Sample & Tare, g	560.20
Mass of Tare, g	146.60
Moisture Content, %	32.01

LIQUID LIMIT (LL)	66
PLASTIC LIMIT (PL)	34
PLASTICITY INDEX (PI)	32
LIQUIDITY INDEX (LI)	-0.06

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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AAP® AASHTO P18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10650/CC-5	Depth/Elev.	-
Location	Lift 3	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	692.60
Mass of Dry Sample & Tare, g	560.20
Mass of Tare, g	146.60
Moisture Content, %	32.0

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	265.00
Mass of Dry Sample & Tare, g	235.60
Mass of Tare, g	61.00
Moisture Content, %	16.8

Mass of Total Sample before separation on #4 sieve & Tare, g	21200.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	18144.71

Mass of Sample used for hydrometer analysis, g	70.10
Dry Mass, g	60.00
% of Total Sample passing #4 sieve	99.8

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"		0.00	0.0	100.0
.75"	FINE GRAVEL	9.13	0.1	99.9
.5"		25.26	0.1	99.9
.375"		25.26	0.1	99.9
#4	COARSE SAND	33.01	0.2	99.8

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.30	99.3
#20		1.13	97.9
#40	FINE SAND	2.49	95.7
#60		4.42	92.5
#100		6.79	88.5
#200	FINES	10.85	81.8

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:48

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	3.6
% COARSE GRAVEL	0.1	% FINE SAND	13.9
% FINE GRAVEL	0.1	% FINES	81.8
% COARSE SAND	0.5	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	61.2	% CLAY(<0.002mm)	53.9

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:50	2	52.5	18.5	0.01361	6.5	46.0	8.7	0.99	0.0285	75.8
11/30/10	14:53	5	50.0	18.5	0.01361	6.5	43.5	9.2	0.99	0.0184	71.6
11/30/10	15:03	15	48.5	18.5	0.01361	6.5	42.0	9.4	0.99	0.0108	69.2
11/30/10	15:18	30	46.5	18.5	0.01361	6.5	40.0	9.7	0.99	0.0078	65.9
11/30/10	15:48	60	44.5	18.5	0.01361	6.5	38.0	10.1	0.99	0.0056	62.6
11/30/10	18:58	250	40.5	18.5	0.01361	6.5	34.0	10.7	0.99	0.0028	56.0
12/01/10	14:48	1440	38.0	18.5	0.01361	6.5	31.5	11.2	0.99	0.0012	51.9

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

TIMELY ENGINEERING SOIL TESTS, LLC

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Web: www.test-llc.com

AASHTO R18

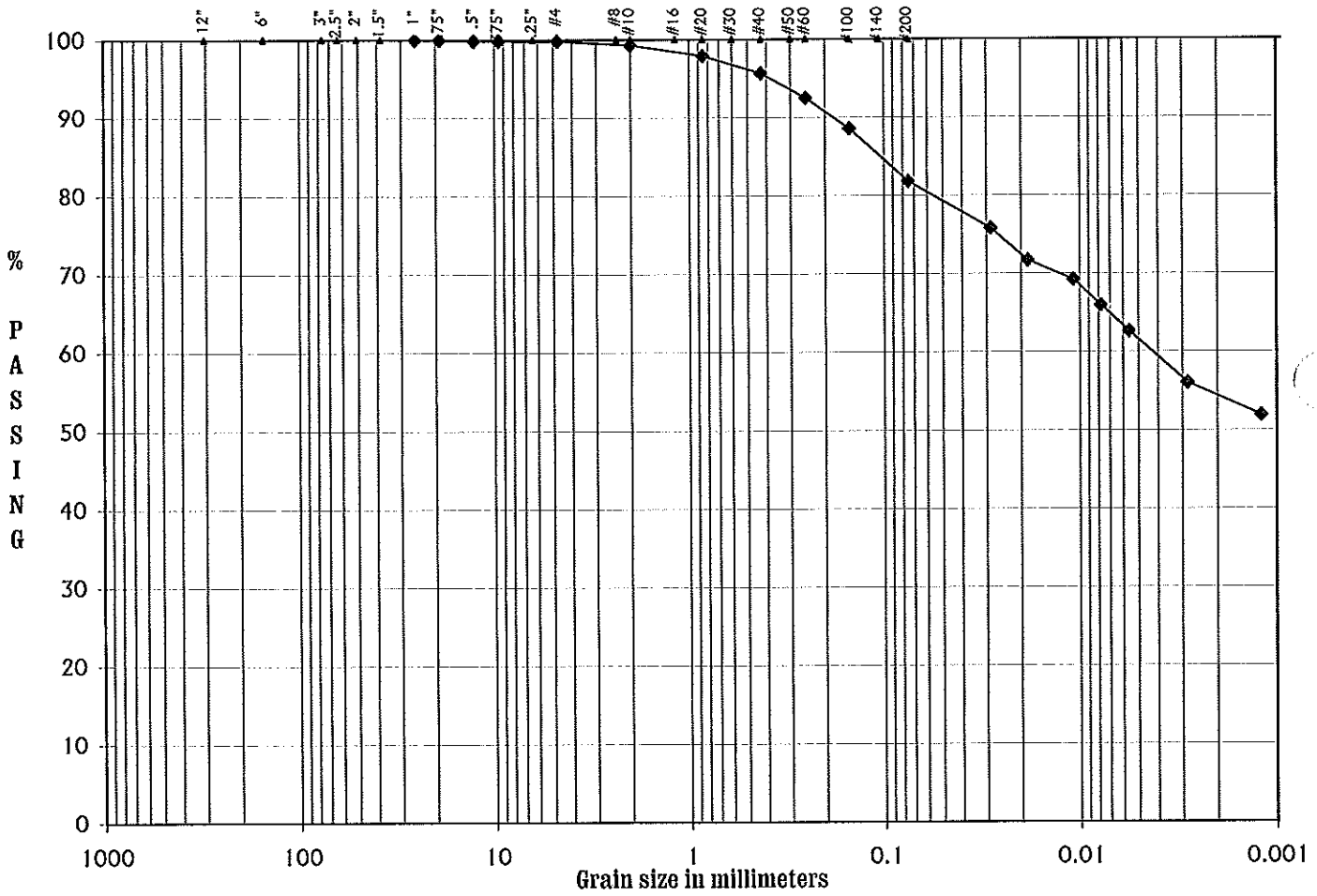
Tested By	RI
Date	1( )0
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10650/CC-5	Depth/Elev.	-
Location	Lift 3	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

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AASHTO R18

Tested By	RI
Date	11/26/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10650/CC-5	Depth/Elev.	-
Location	Lift 3	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	21200.0	16059.2
Mass of Mat. Retained on No. 4 sieve, g	33.0	33.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.2
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.2

MOISTURE CONTENT

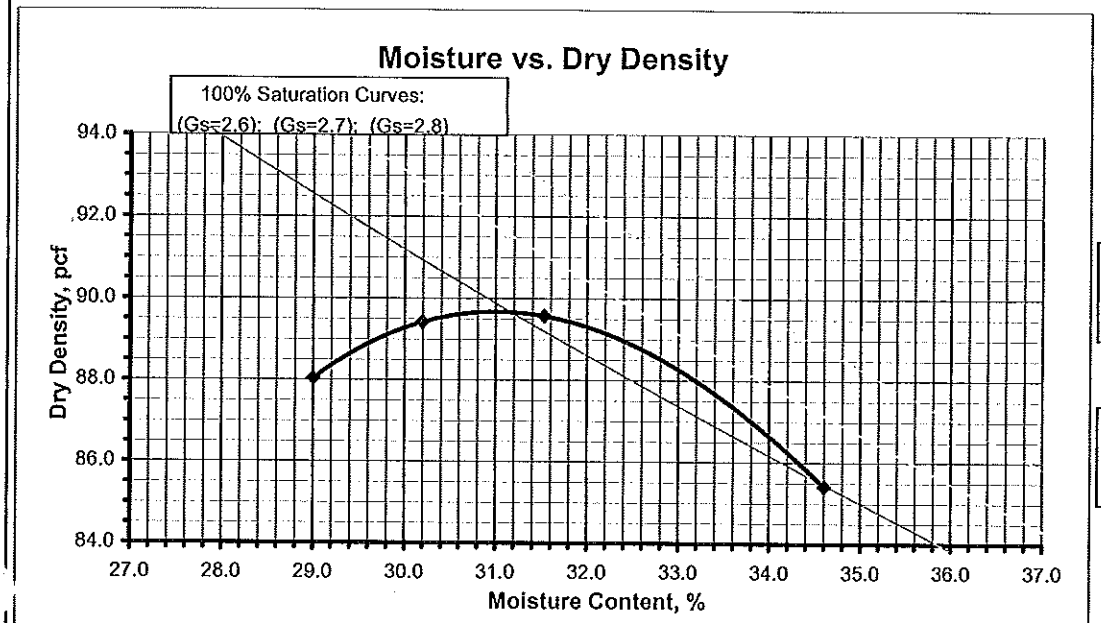
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	692.6	33.0
Mass of Dry Sample & Tare, g	560.2	33.0
Mass of Tare, g	146.6	0.0
Moisture Content, %	32.0	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5966.0	6009.0	6030.0	5987.0	
Mass of Wet Sample & Tare, g	750.0	528.0	724.5	748.0	
Mass of Dry Sample & Tare, g	654.0	443.0	626.1	639.0	
Mass of Tare, g	323.0	161.5	314.0	324.0	
Moisture Content, %	29.0	30.2	31.5	34.6	
Wet Density, pcf	113.6	116.4	117.8	115.0	
Dry Density, pcf	88.0	89.4	89.6	85.4	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	89.7	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	31.0	**Corrected Optimum Moisture Content, %**	NA

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	NK/IN
		Date	11/30/
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10651/CC-6	Depth/Elev.	-
Location	Lift 3	Add. Info	-

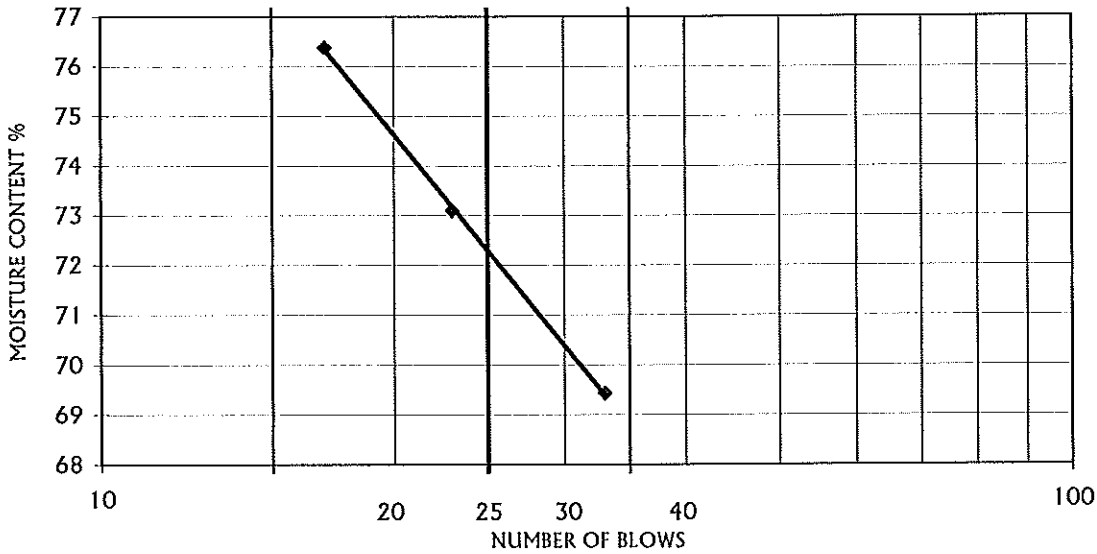
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	33	23	17
Mass of Wet Sample & Tare, g	38.82	39.13	36.89
Mass of Dry Sample & Tare, g	33.03	33.29	30.78
Mass of Tare, g	24.69	25.30	22.78
Moisture Content, %	69.42	73.09	76.38

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	28.04	33.58
Mass of Dry Sample & Tare, g	25.99	30.54
Mass of Tare, g	20.42	22.27
Moisture Content, %	36.80	36.76

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	674.20
Mass of Dry Sample & Tare, g	535.50
Mass of Tare, g	154.80
Moisture Content, %	36.43

LIQUID LIMIT (LL)	72
PLASTIC LIMIT (PL)	37
PLASTICITY INDEX (PI)	35
LIQUIDITY INDEX (LI)	-0.02

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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AAP AASHTO R18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 21	S. Type	Bulk
Sample ID	10651/CC-6	Depth/Elev.	-
Location	Lift 3	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	674.20
Mass of Dry Sample & Tare, g	535.50
Mass of Tare, g	154.80
Moisture Content, %	36.4

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	273.50
Mass of Dry Sample & Tare, g	234.90
Mass of Tare, g	61.10
Moisture Content, %	22.2

Mass of Total Sample before separation on #4 sieve & Tare, g	21300.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	17429.10

Mass of Sample used for hydrometer analysis, g	70.70
Dry Mass, g	57.85
% of Total Sample passing #4 sieve	99.9

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL	0.00	0.0	100.0
.5"		8.21	0.0	100.0
.375"		12.56	0.1	99.9
#4	COARSE SAND	18.91	0.1	99.9

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.30	99.4
#20		0.89	98.4
#40	FINE SAND	1.78	96.8
#60		3.59	93.7
#100		5.81	89.9
#200	FINES	9.18	84.0

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:50

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	2.6
% COARSE GRAVEL	0.0	% FINE SAND	12.8
% FINE GRAVEL	0.1	% FINES	84.0
% COARSE SAND	0.5	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	61.0	% CLAY(<0.002mm)	53.8

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:52	2	51.0	18.5	0.01361	6.5	44.5	9.0	0.99	0.0289	76.1
11/30/10	14:55	5	49.0	18.5	0.01361	6.5	42.5	9.3	0.99	0.0186	72.7
11/30/10	15:05	15	46.5	18.5	0.01361	6.5	40.0	9.7	0.99	0.0110	68.4
11/30/10	15:20	30	45.5	18.5	0.01361	6.5	39.0	9.9	0.99	0.0078	66.7
11/30/10	15:50	60	43.0	18.5	0.01361	6.5	36.5	10.3	0.99	0.0056	62.4
11/30/10	19:00	250	39.5	18.5	0.01361	6.5	33.0	10.9	0.99	0.0028	56.4
12/01/10	14:50	1440	36.5	18.5	0.01361	6.5	30.0	11.4	0.99	0.0012	51.3

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

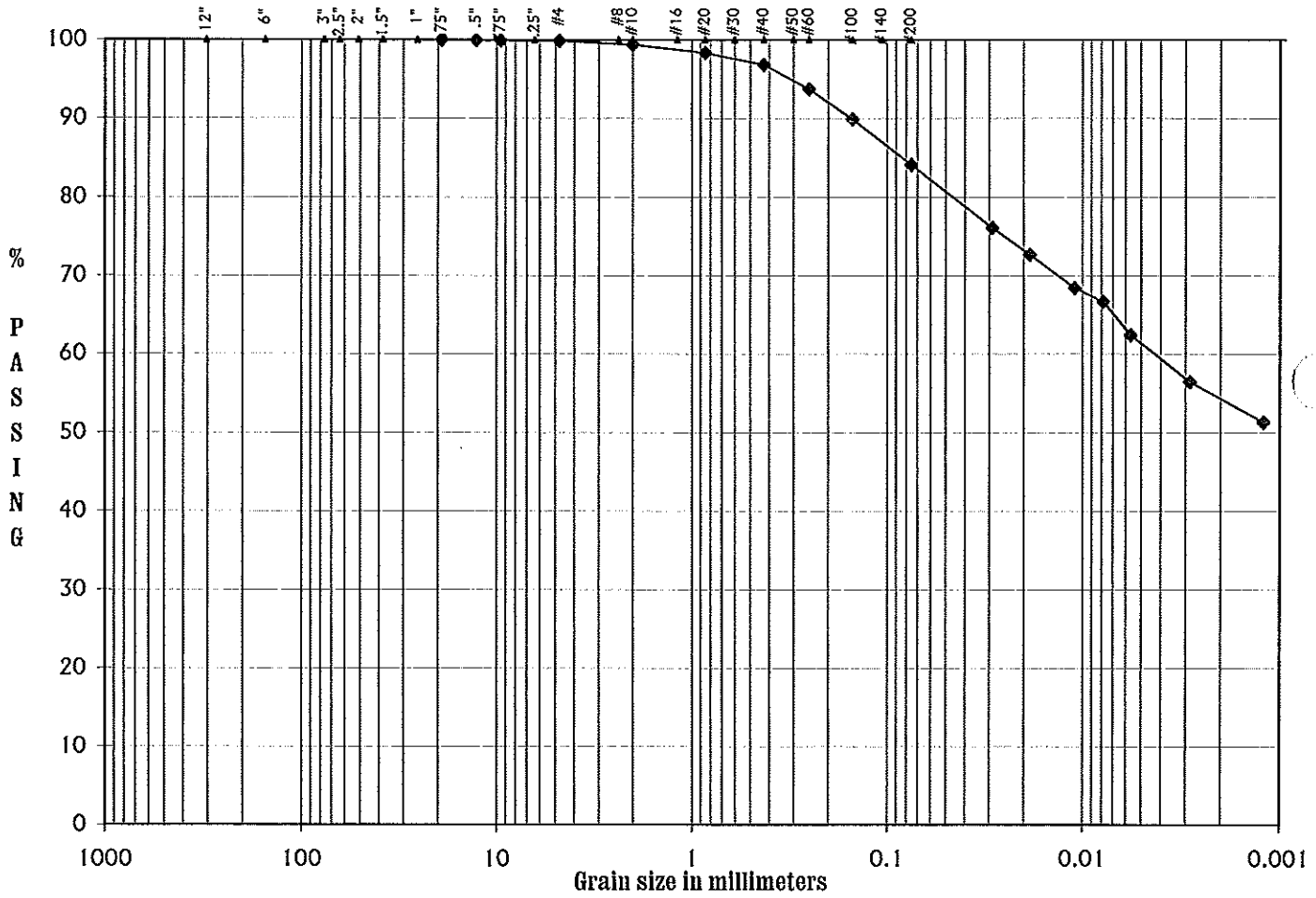
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: RI Date: Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10651/CC-6	Depth/Elev.	-
Location	Lift 3	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Gravel: Coarse	Gravel: Fine	Sand: Coarse	Sand: Medium	Sand: Fine	Fines: Silt or Clay

DESCRIPTION: NA

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

USCS (ASTM D2487; D2488): NA

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AASHTO R18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10651/CC-6	Depth/Elev.	-
Location	Lift 3	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	21300.0	15612.1
Mass of Mat. Retained on No. 4 sieve, g	18.9	18.9
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.1
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.1

MOISTURE CONTENT

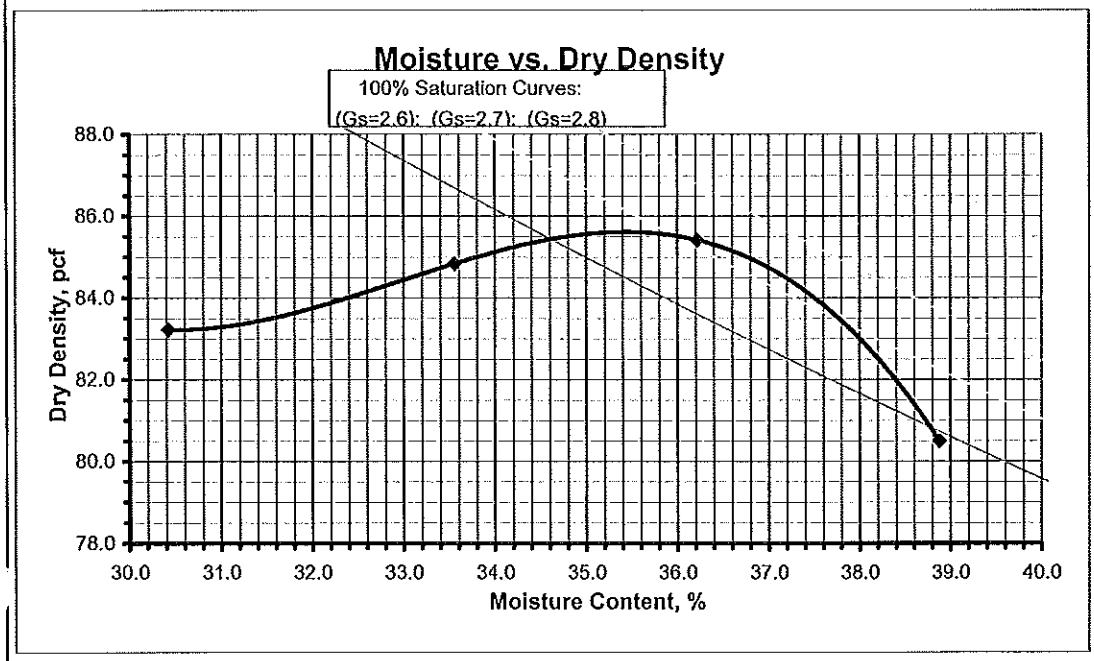
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	674.2	18.9
Mass of Dry Sample & Tare, g	535.5	18.9
Mass of Tare, g	154.8	0.0
Moisture Content, %	36.4	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5890.0	5962.0	6008.0	5939.0	
Mass of Wet Sample & Tare, g	545.5	512.0	524.0	518.0	
Mass of Dry Sample & Tare, g	467.0	387.5	423.5	414.0	
Mass of Tare, g	209.0	16.5	146.0	146.5	
Moisture Content, %	30.4	33.6	36.2	38.9	
Wet Density, pcf	108.5	113.3	116.4	111.8	
Dry Density, pcf	83.2	84.8	85.4	80.5	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	85.7	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	35.5	**Corrected Optimum Moisture Content, %**	NA

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		Date	11/30/1
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10652/CC-7	Depth/Elev.	-
Location	Lift 4	Add. Info	-

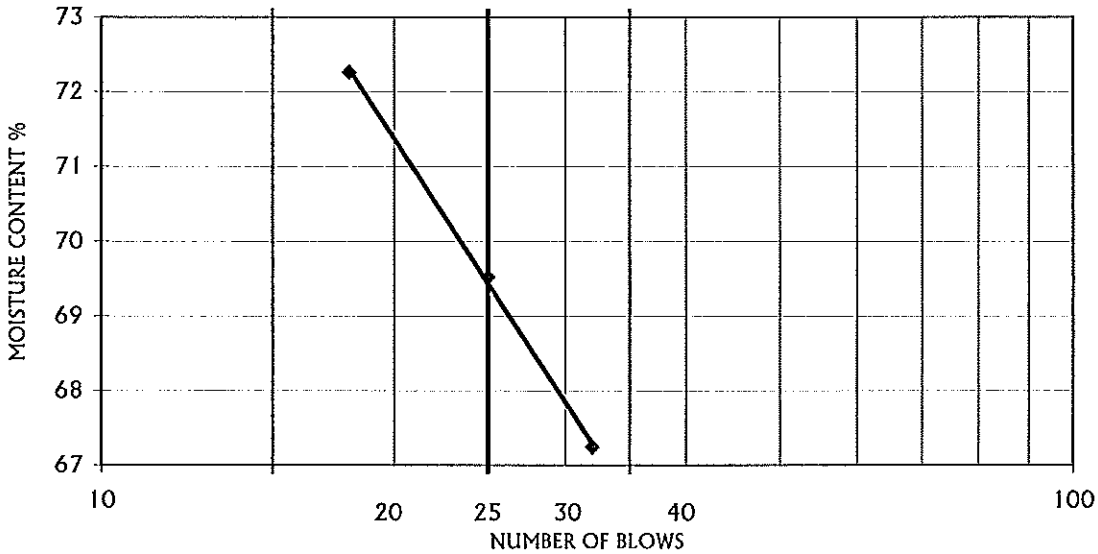
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	32	25	18
Mass of Wet Sample & Tare, g	38.47	39.24	42.54
Mass of Dry Sample & Tare, g	32.62	33.88	35.69
Mass of Tare, g	23.92	26.17	26.21
Moisture Content, %	67.24	69.52	72.26

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	28.21	29.07
Mass of Dry Sample & Tare, g	25.50	26.30
Mass of Tare, g	18.32	18.89
Moisture Content, %	37.74	37.38

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	699.60
Mass of Dry Sample & Tare, g	561.60
Mass of Tare, g	156.60
Moisture Content, %	34.07

LIQUID LIMIT (LL)	69
PLASTIC LIMIT (PL)	38
PLASTICITY INDEX (PI)	31
LIQUIDITY INDEX (LI)	-0.13

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10652/CC-7	Depth/Elev.	-
Location	Lift 4	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	699.60
Mass of Dry Sample & Tare, g	561.60
Mass of Tare, g	156.60
Moisture Content, %	34.1

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	269.50
Mass of Dry Sample & Tare, g	239.80
Mass of Tare, g	60.70
Moisture Content, %	16.6

Mass of Total Sample before separation on #4 sieve & Tare, g	20300.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	17412.50

Mass of Sample used for hydrometer analysis, g	70.90
Dry Mass, g	60.82
% of Total Sample passing #4 sieve	99.6

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"			0.0	100.0
2.5"	COARSE		0.0	100.0
2"	GRAVEL		0.0	100.0
1.5"			0.0	100.0
1"		42.72	0.2	99.8
.75"		42.72	0.2	99.8
.5"	FINE GRAVEL	47.65	0.3	99.7
.375"		58.21	0.3	99.7
#4	COARSE SAND	74.47	0.4	99.6

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM	0.27	99.1
#20	SAND	1.22	97.6
#40		2.64	95.2
#60	FINE SAND	4.23	92.6
#100		6.44	89.0
#200	FINES	9.55	83.9

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:52

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	3.9
% COARSE GRAVEL	0.2	% FINE SAND	11.3
% FINE GRAVEL	0.2	% FINES	83.9
% COARSE SAND	0.4	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	62.8	% CLAY(<0.002mm)	55.6

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:54	2	54.0	18.5	0.01361	6.5	47.5	8.5	0.99	0.0281	77.0
11/30/10	14:57	5	52.5	18.5	0.01361	6.5	46.0	8.7	0.99	0.0180	74.6
11/30/10	15:07	15	50.0	18.5	0.01361	6.5	43.5	9.2	0.99	0.0106	70.5
11/30/10	15:22	30	48.0	18.5	0.01361	6.5	41.5	9.5	0.99	0.0077	67.3
11/30/10	15:52	60	46.0	18.5	0.01361	6.5	39.5	9.8	0.99	0.0055	64.0
11/30/10	19:02	250	42.0	18.5	0.01361	6.5	35.5	10.5	0.99	0.0028	57.5
12/01/10	14:52	1440	39.5	18.5	0.01361	6.5	33.0	10.9	0.99	0.0012	53.5

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

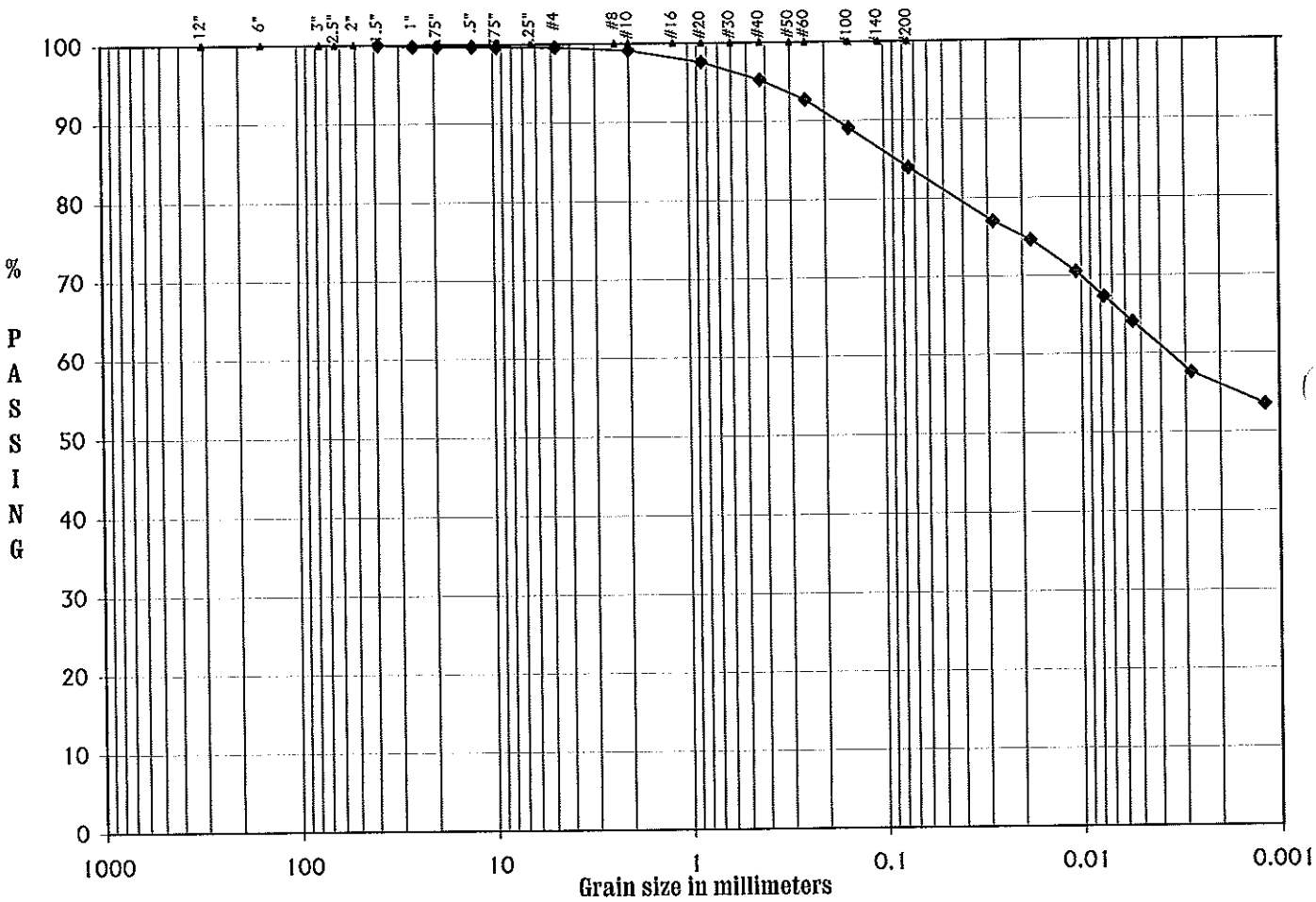
TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO R18	Tested By: RI Date: 11/ Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10652/CC-7	Depth/Elev.	-
Location	Lift 4	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
		Gravel		Sand			Fines

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO P18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10652/CC-7	Depth/Elev.	-
Location	Lift 4	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	20300.0	15140.9
Mass of Mat. Retained on No. 4 sieve, g	74.5	74.5
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.5
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.5

MOISTURE CONTENT

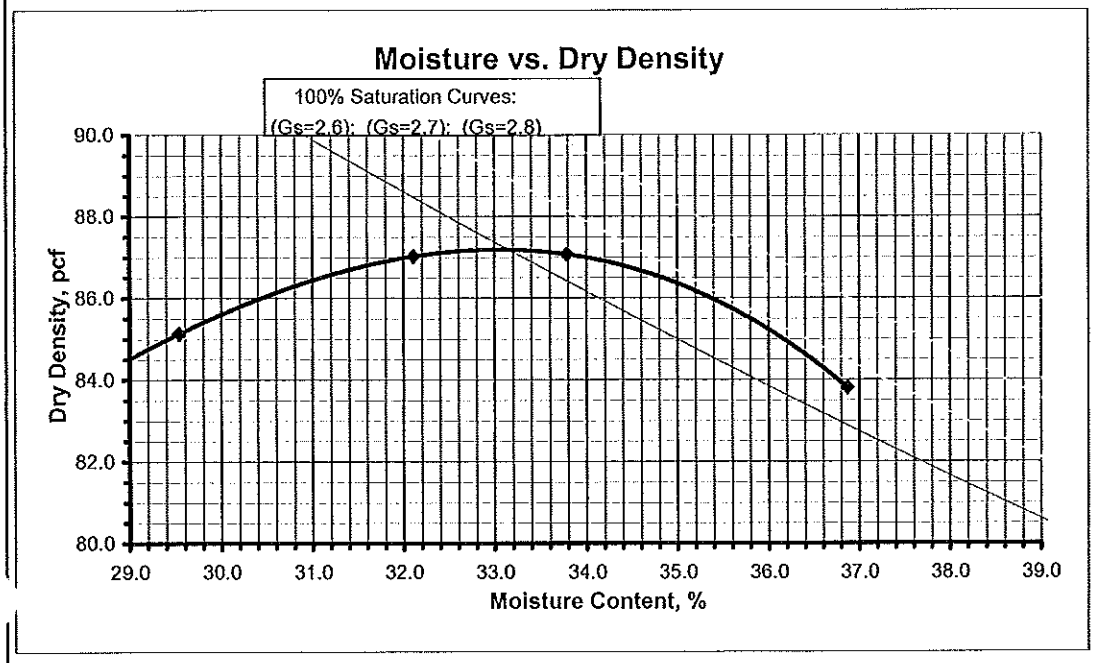
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	699.6	74.5
Mass of Dry Sample & Tare, g	561.6	74.5
Mass of Tare, g	156.6	0.0
Moisture Content, %	34.1	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5916.0	5987.0	6010.0	5983.0	
Mass of Wet Sample & Tare, g	438.5	587.5	598.5	587.5	
Mass of Dry Sample & Tare, g	375.0	482.5	499.5	485.0	
Mass of Tare, g	160.0	155.5	206.5	207.0	
Moisture Content, %	29.5	32.1	33.8	36.9	
Wet Density, pcf	110.3	115.0	116.5	114.7	
Dry Density, pcf	85.1	87.0	87.1	83.8	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	87.2	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	33.2	**Corrected Optimum Moisture Content, %**	NA

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	NK/IN
		Date	11/30
		Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10653/CC-8	Depth/Elev.	-
Location	Lift 4	Add. Info	-

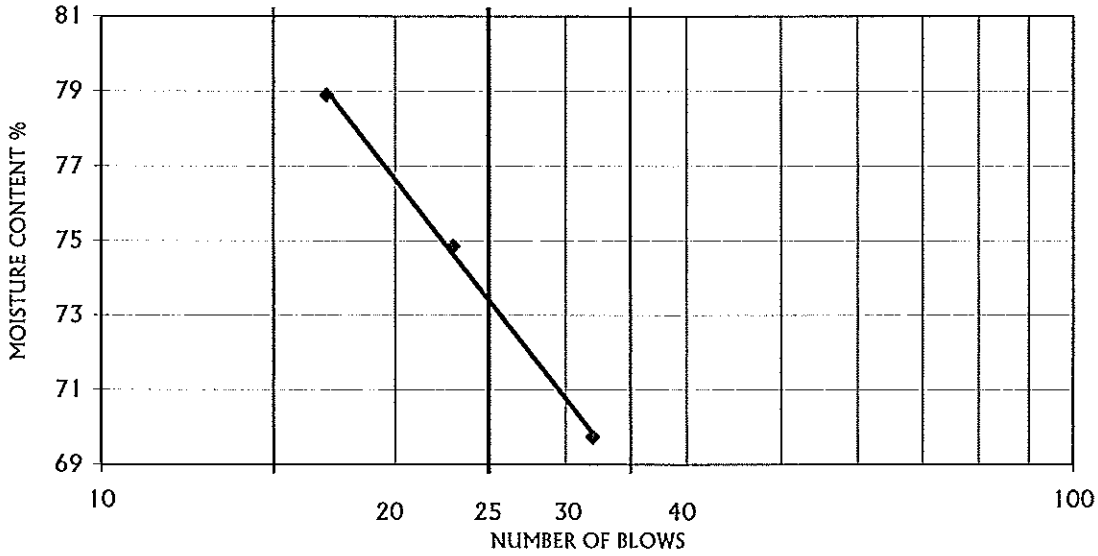
ASTM D 4318/AASHTO T 88, T 89

Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

LIQUID LIMIT

Number of Blows	32	23	17
Mass of Wet Sample & Tare, g	40.34	41.37	39.82
Mass of Dry Sample & Tare, g	34.65	35.39	33.02
Mass of Tare, g	26.49	27.40	24.40
Moisture Content, %	69.73	74.84	78.89

Oven ID #	12/13/14/15
Balance ID #	2
Liquid Limit Device ID #	56



PLASTIC LIMIT

Mass of Wet Sample & Tare, g	35.73	36.50
Mass of Dry Sample & Tare, g	32.98	33.53
Mass of Tare, g	25.87	25.88
Moisture Content, %	38.68	38.82

PREPARATION PROCEDURE: DRY

NOTE: MATERIAL PASSING NO. 40 SIEVE WAS USED FOR TEST

NATURAL MOISTURE

Mass of Wet Sample & Tare, g	881.80
Mass of Dry Sample & Tare, g	688.60
Mass of Tare, g	152.90
Moisture Content, %	36.06

LIQUID LIMIT (LL)	73
PLASTIC LIMIT (PL)	39
PLASTICITY INDEX (PI)	34
LIQUIDITY INDEX (LI)	-0.09

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

TIMELY ENGINEERING SOIL TESTS, LLC

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AASHTO R18

Tested By	RI
Date	11/29/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10653/CC-8	Depth/Elev.	-
Location	Lift 4	Add. Info	-

ASTM D 422/AASHTO T 88
Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

As-Received Moisture Content

Mass of Wet Sample & Tare, g	881.80
Mass of Dry Sample & Tare, g	688.60
Mass of Tare, g	152.90
Moisture Content, %	36.1

Moisture Content of Material Used for Hydrometer Analysis

Mass of Wet Sample & Tare, g	267.90
Mass of Dry Sample & Tare, g	230.20
Mass of Tare, g	60.50
Moisture Content, %	22.2

Mass of Total Sample before separation on #4 sieve & Tare, g	21600.00
Mass of Tare, g	0.00
Total Mass of Dry Sample, g	17673.67

Mass of Sample used for hydrometer analysis, g	68.50
Dry Mass, g	56.05
% of Total Sample passing #4 sieve	99.9

SIEVE ANALYSIS

PORTION OF SAMPLE RETAINED ON #4 SIEVE

Mass of Tare, g: 0.00

Sieve Size		Sample & Tare, g	% RETAINED	%PASSING
12"	COBBLES		0.0	100.0
3"	COARSE GRAVEL		0.0	100.0
2.5"			0.0	100.0
2"			0.0	100.0
1.5"			0.0	100.0
1"			0.0	100.0
.75"	FINE GRAVEL		0.0	100.0
.5"		7.30	0.0	100.0
.375"		7.30	0.0	100.0
#4	COARSE SAND	11.46	0.1	99.9

PORTION OF SAMPLE PASSING #4 SIEVE (Hydrometer Backsieve)

Sieve Size		Cumulative Mass retained, g	% PASSING
#10	MEDIUM SAND	0.61	98.8
#20		1.30	97.6
#40	FINE SAND	2.07	96.2
#60		3.56	93.6
#100		5.59	90.0
#200	FINES	8.87	84.1

Remarks

HYDROMETER ANALYSIS

Length of Dispersion Period	1 Minute
Mechanical Dispersion Device ID #	61
Amount of Dispersing Agent (ml)	125.0
Specific Gravity (assumed)	2.700
Specific Gravity (tested)	
Starting time	14:54

PARTICLE-SIZE ANALYSIS

% COBBLES	0.0	% MEDIUM SAND	2.6
% COARSE GRAVEL	0.0	% FINE SAND	12.1
% FINE GRAVEL	0.1	% FINES	84.1
% COARSE SAND	1.1	% TOTAL SAMPLE	100.0
% CLAY(<0.005mm)	59.1	% CLAY(<0.002mm)	52.4

Date	Time	Testing time (min)	Reading	Temp (°C)	K	Composite Correction	Actual Reading	Effective Depth (cm)	a	Particle Diam. (mm)	Percent Passing
11/30/10	14:56	2	50.0	18.5	0.01361	6.5	43.5	9.2	0.99	0.0291	76.8
11/30/10	14:59	5	47.5	18.5	0.01361	6.5	41.0	9.6	0.99	0.0188	72.4
11/30/10	15:09	15	45.0	18.5	0.01361	6.5	38.5	10.0	0.99	0.0111	68.0
11/30/10	15:24	30	43.0	18.5	0.01361	6.5	36.5	10.3	0.99	0.0080	64.4
11/30/10	15:54	60	41.0	18.5	0.01361	6.5	34.5	10.7	0.99	0.0057	60.9
11/30/10	19:04	250	37.0	18.5	0.01361	6.5	30.5	11.3	0.99	0.0029	53.8
12/01/10	14:54	1440	35.5	18.5	0.01361	6.5	29.0	11.6	0.99	0.0012	51.2

Hydrometer 152H ID #	451190	Oven ID #	12/13/14/15
Sieve Shaker ID #	54/130	Balance ID#	1/6/7

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AASHTO R18

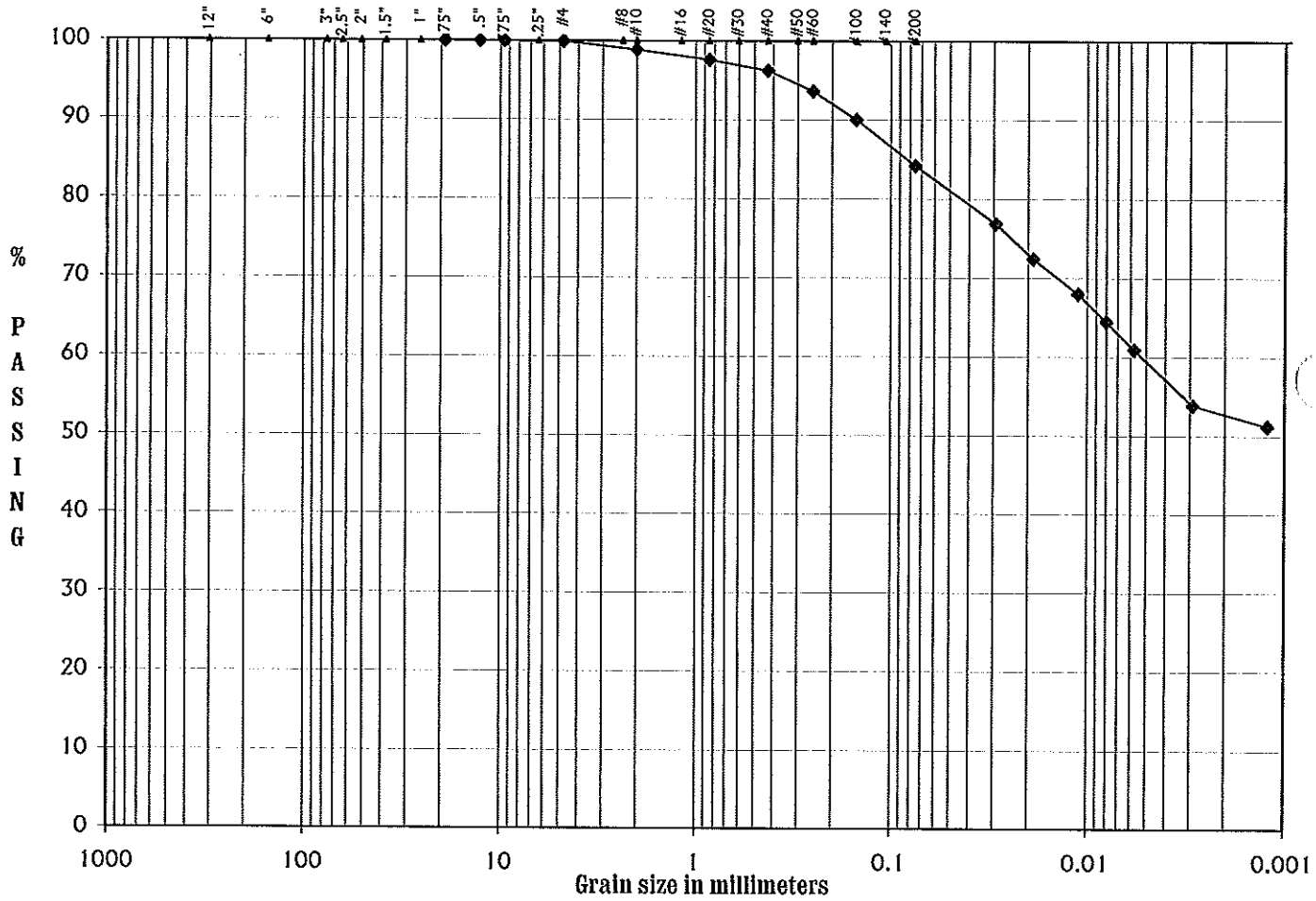
Tested By	RI
Date	1
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10653/CC-8	Depth/Elev.	-
Location	Lift 4	Add. Info	-

ASTM D 422/AASHTO T 88

Standard Test Method for Particle-Size Analysis of Soils (with Hydrometer Analysis)

Particle-Size Analysis



Boulders	Cobbles	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
		Gravel		Sand			Fines

DESCRIPTION: NA

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	NA	mm
Cu	NA	
Cc	NA	

USCS (ASTM D2487; D2488): NA

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AASHTO R18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS/Cell 2I	S. Type	Bulk
Sample ID	10653/CC-8	Depth/Elev.	-
Location	Lift 4	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	21600.0	15874.8
Mass of Mat. Retained on No. 4 sieve, g	11.5	11.5
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	0.1
Material Retained on 3/8" Sieve, %	
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	0.1

MOISTURE CONTENT

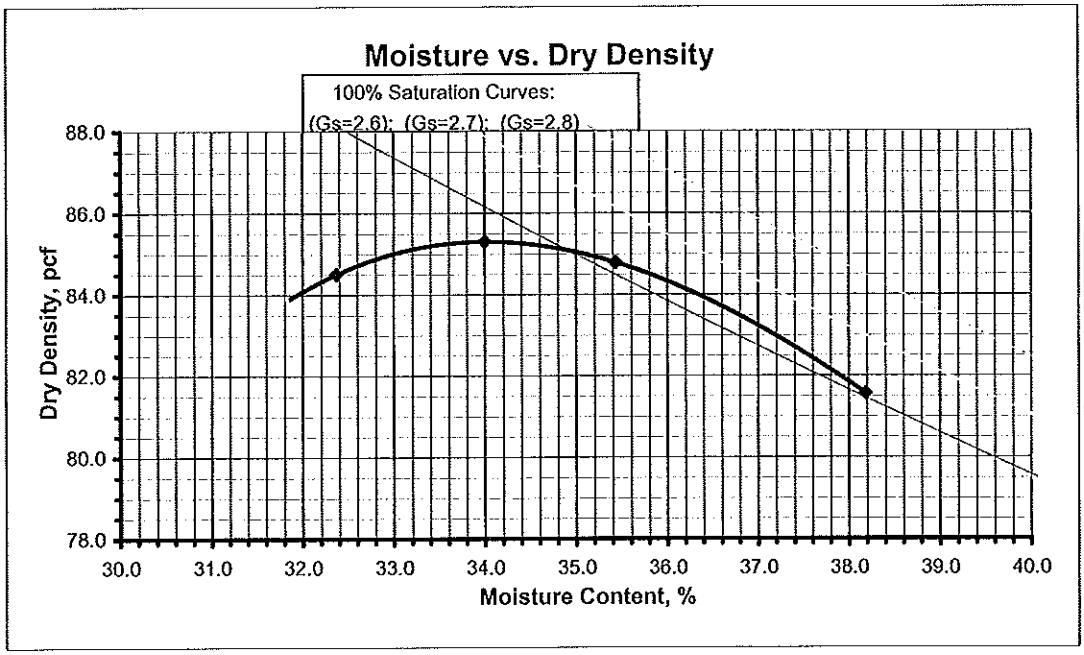
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	881.8	11.5
Mass of Dry Sample & Tare, g	688.6	11.5
Mass of Tare, g	152.9	0.0
Moisture Content, %	36.1	0.0

Procedure: A

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5940.0	5977.0	5985.0	5953.0	
Mass of Wet Sample & Tare, g	594.0	700.0	510.5	556.5	
Mass of Dry Sample & Tare, g	499.0	580.5	417.5	445.0	
Mass of Tare, g	205.5	229.0	155.0	153.0	
Moisture Content, %	32.4	34.0	35.4	38.2	
Wet Density, pcf	111.9	114.3	114.8	112.7	
Dry Density, pcf	84.5	85.3	84.8	81.6	

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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	85.3	**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %	34.0	**Corrected Optimum Moisture Content, %**	NA

of NORTH CAROLINA, PLLC

SECTION G-2

Laboratory Shelby Tube 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 (ST-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution %Finer #4 Sieve	% Finer #200 Sieve	% Finer 0.005mm	Atterberg Limits L.L. %	P.L. %	P.I. %	Proctor Opt. M.C. %	Max.Dry. Density pcf	Hydraulic Conductivity Initial M.C. %	Init.Dry Density pcf	Hydraulic Conduct. cm/sec
10564	ST-1	-	-	-	-	-	-	-	-	-	-	35.9	87.3	3.2E-08
10565	ST-2	-	-	-	-	-	-	-	-	-	-	27.6	98.2	2.5E-08
10566	ST-3	-	-	-	-	-	-	-	-	-	-	35.3	87.9	3.1E-08
10567	ST-4	-	-	-	-	-	-	-	-	-	-	33.6	89.3	4.4E-08
10568	ST-5	-	-	-	-	-	-	-	-	-	-	34.5	88.3	3.4E-08
10569	ST-6	-	-	-	-	-	-	-	-	-	-	31.1	91.9	3.2E-08
10570	ST-7	-	-	-	-	-	-	-	-	-	-	35.8	88.4	3.4E-08
10583	ST-8	-	-	-	-	-	-	-	-	-	-	33.6	90.0	5.1E-08
10584	ST-9	-	-	-	-	-	-	-	-	-	-	33.1	88.8	9.1E-08
10585	ST-10	-	-	-	-	-	-	-	-	-	-	37.8	86.7	5.9E-08
10586	ST-11	-	-	-	-	-	-	-	-	-	-	37.6	86.4	3.9E-08
10587	ST-12	-	-	-	-	-	-	-	-	-	-	35.0	87.3	4.1E-08
10588	ST-13	-	-	-	-	-	-	-	-	-	-	37.1	86.3	4.9E-08
10589	ST-14	-	-	-	-	-	-	-	-	-	-	36.1	87.5	3.8E-08
10590	ST-15	-	-	-	-	-	-	-	-	-	-	27.4	96.8	5.0E-08
10591	ST-16	-	-	-	-	-	-	-	-	-	-	34.8	86.1	7.9E-08
10592	ST-17	-	-	-	-	-	-	-	-	-	-	36.6	85.1	5.1E-08
10593	ST-18	-	-	-	-	-	-	-	-	-	-	36.2	86.0	5.1E-08
10600	ST-19	-	-	-	-	-	-	-	-	-	-	31.7	88.1	8.9E-08
10601	ST-20	-	-	-	-	-	-	-	-	-	-	29.9	91.2	8.0E-08
10602	ST-21	-	-	-	-	-	-	-	-	-	-	29.4	94.8	5.0E-08
10603	ST-22	-	-	-	-	-	-	-	-	-	-	32.2	89.8	6.6E-08
10604	ST-23	-	-	-	-	-	-	-	-	-	-	31.9	89.4	6.1E-08
10605	ST-24	-	-	-	-	-	-	-	-	-	-	37.2	84.7	7.5E-08
10606	ST-25	-	-	-	-	-	-	-	-	-	-	41.4	81.3	8.5E-08
10607	ST-26	-	-	-	-	-	-	-	-	-	-	38.0	84.8	5.3E-08
10608	ST-27	-	-	-	-	-	-	-	-	-	-	32.8	89.6	5.5E-08
10609	ST-28	-	-	-	-	-	-	-	-	-	-	30.9	94.1	4.7E-08

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 (ST-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 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
10610	ST-29	-	-	-	-	-	-	-	-	-	-	37.6	84.7	6.8E-08
10611	ST-30	-	-	-	-	-	-	-	-	-	-	33.5	88.7	8.7E-08
10612	ST-31	-	-	-	-	-	-	-	-	-	-	35.0	87.3	5.9E-08
10613	ST-32	-	-	-	-	-	-	-	-	-	-	34.5	87.7	5.2E-08
10614	ST-33	-	-	-	-	-	-	-	-	-	-	33.0	89.7	6.2E-08
10615	ST-34	-	-	-	-	-	-	-	-	-	-	29.5	94.3	5.1E-08
10616	ST-35	-	-	-	-	-	-	-	-	-	-	35.3	82.7	9.7E-08
10617	ST-36	-	-	-	-	-	-	-	-	-	-	37.9	83.7	6.1E-08
10618	ST-37	-	-	-	-	-	-	-	-	-	-	40.0	82.3	6.3E-08
10619	ST-38	-	-	-	-	-	-	-	-	-	-	36.4	86.2	4.5E-08
10620	ST-39	-	-	-	-	-	-	-	-	-	-	32.3	90.7	6.5E-08
10621	ST-40	-	-	-	-	-	-	-	-	-	-	35.6	86.4	7.5E-08
10622	ST-41	-	-	-	-	-	-	-	-	-	-	38.1	85.0	3.9E-08
10645	ST-42	-	-	-	-	-	-	-	-	-	-	39.3	82.8	4.9E-08
10625	ST-43	-	-	-	-	-	-	-	-	-	-	35.5	86.9	6.0E-08
10626	ST-44	-	-	-	-	-	-	-	-	-	-	37.1	82.3	6.5E-08
10627	ST-45	-	-	-	-	-	-	-	-	-	-	33.5	86.1	4.8E-08
10628	ST-46	-	-	-	-	-	-	-	-	-	-	38.5	81.4	7.1E-08
10629	ST-47	-	-	-	-	-	-	-	-	-	-	39.6	82.1	5.2E-08
10630	ST-48	-	-	-	-	-	-	-	-	-	-	36.2	86.1	6.6E-08
10631	ST-49	-	-	-	-	-	-	-	-	-	-	38.1	81.3	7.3E-08
10632	ST-50	-	-	-	-	-	-	-	-	-	-	38.1	83.3	5.4E-08
10633	ST-51	-	-	-	-	-	-	-	-	-	-	34.6	87.2	5.1E-08
10634	ST-52	-	-	-	-	-	-	-	-	-	-	38.6	83.2	4.6E-08
10635	ST-53	-	-	-	-	-	-	-	-	-	-	37.4	84.0	4.3E-08
10636	ST-54	-	-	-	-	-	-	-	-	-	-	40.8	80.1	5.6E-08
10857	ST-55	-	-	-	-	-	-	-	-	-	-	32.5	88.8	5.0E-08
10858	ST-56	-	-	-	-	-	-	-	-	-	-	36.7	82.4	5.1E-08

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Web: www.test-llc.com

Summary of Soil Testing (ST-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 Siev	% 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
10859	ST-57	-	-	-	-	-	-	-	-	-	-	37.8	82.6	8.5E-08
10860	ST-58	-	-	-	-	-	-	-	-	-	-	37.4	84.5	3.8E-08
10861	ST-59	-	-	-	-	-	-	-	-	-	-	34.2	87.5	4.6E-08
10862	ST-60	-	-	-	-	-	-	-	-	-	-	33.9	87.5	4.7E-08
10863	ST-61	-	-	-	-	-	-	-	-	-	-	34.4	87.3	4.5E-08
10864	ST-62	-	-	-	-	-	-	-	-	-	-	31.5	86.2	4.8E-08
10865	ST-63	-	-	-	-	-	-	-	-	-	-	33.7	87.7	8.7E-08
10866	ST-64	-	-	-	-	-	-	-	-	-	-	38.4	83.4	6.5E-08
10867	ST-65	-	-	-	-	-	-	-	-	-	-	38.2	83.3	5.0E-08
10868	ST-66	-	-	-	-	-	-	-	-	-	-	32.9	88.8	9.8E-08
10869	ST-67	-	-	-	-	-	-	-	-	-	-	36.0	85.7	9.6E-08
10870	ST-68	-	-	-	-	-	-	-	-	-	-	33.7	88.5	5.1E-08
10871	ST-69	-	-	-	-	-	-	-	-	-	-	35.8	86.1	9.4E-08
10872	ST-70	-	-	-	-	-	-	-	-	-	-	34.2	87.8	6.9E-08
10873	ST-71	-	-	-	-	-	-	-	-	-	-	33.3	89.1	4.7E-08
10874	ST-72	-	-	-	-	-	-	-	-	-	-	38.2	83.4	7.7E-08

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Tested By	VG
Date	11/19/10
Checked By	VA

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10564/ST-1	Depth/Elev.	-
Location	-	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	3.051	in	7.75	cm
Diameter	2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2
Volume	320.07	cm^3	0.0113	ft^3
Mass	608.70	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.3	pcf		

Moisture Content

Mass of wet sample & tare	608.70	g
Mass of dry sample & tare	447.90	g
Mass of tare	0.00	g
% Moisture	35.9	

Test Data

Speed	13	
Board Number	5	
Cell Number	5	
Flow Pump Number	2A	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	163.19	cm
Min Head	162.49	cm
Maximum Gradient	21.20	
Minimum Gradient	21.11	

Final Data (After Test)

Average Height of Sample			3.030	in	7.70	cm
Average Diameter of Sample			2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2		
Volume	317.64	cm^3	0.0112	ft^3		
Mass	610.10	g	1.35	lb		

Dry Density	88.0	pcf
Vol. of Voids	154.69	cm^3
Vol. of Solids	162.95	cm^3
Void Ratio	0.95	
Saturation	104.7	%

Moisture Content

Mass of wet sample & tare	679.20	g
Mass of dry sample & tare	517.30	g
Mass of tare	69.40	g
% Moisture	36.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/19/10	16	40	-	2.31	162.49	21.11	19.7	-	-	-	
11/19/10	16	45	300	2.32	163.19	21.20	19.7	3.21E-08	1.008	3.23E-08	
11/19/10	16	50	300	2.31	162.49	21.11	19.7	3.21E-08	1.008	3.23E-08	
11/19/10	16	55	300	2.32	163.19	21.20	19.7	3.21E-08	1.008	3.23E-08	*
11/19/10	17	0	300	2.31	162.49	21.11	19.7	3.21E-08	1.008	3.23E-08	*
11/19/10	17	5	300	2.31	162.49	21.11	19.7	3.21E-08	1.008	3.24E-08	*
11/19/10	17	10	300	2.32	163.19	21.20	19.7	3.21E-08	1.008	3.23E-08	*

Reported Average Hydraulic Conductivity* 3.2E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Tested By	VG
Date	11/19/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10565/ST-2	Depth/Elev.	-
Location	-	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	3.037	in	7.71	cm
Diameter	2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2
Volume	319.05	cm^3	0.0113	ft^3
Mass	640.70	g	1.41	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	98.2	pcf		

Moisture Content

Mass of wet sample & tare	640.70	g
Mass of dry sample & tare	502.00	g
Mass of tare	0.00	g
% Moisture	27.6	

Test Data

Speed	13	
Board Number	6	
Cell Number	3	
Flow Pump Number	2B	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	209.61	cm
Min Head	208.91	cm
Maximum Gradient	27.26	
Minimum Gradient	27.17	

Final Data (After Test)

Average Height of Sample		3.027	in	7.69 cm
Average Diameter of Sample		2.852	in	7.24 cm
Area	6.39 in^2	41.22	cm^2	
Volume	316.89 cm^3	0.0112	ft^3	
Mass	643.30 g	1.42	lb	

Dry Density	98.9	pcf
Vol. of Voids	134.17	cm^3
Vol. of Solids	182.72	cm^3
Void Ratio	0.73	
Saturation	105.0	%

Moisture Content

Mass of wet sample & tare	720.80	g
Mass of dry sample & tare	580.10	g
Mass of tare	78.10	g
% Moisture	28.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/19/10	16	40	-	2.97	208.91	27.17	19.8	-	-	-	
11/19/10	16	45	300	2.98	209.61	27.26	19.8	2.50E-08	1.005	2.51E-08	
11/19/10	16	50	300	2.98	209.61	27.26	19.8	2.49E-08	1.005	2.50E-08	
11/19/10	16	55	300	2.97	208.91	27.17	19.8	2.50E-08	1.005	2.51E-08	*
11/19/10	17	0	300	2.97	208.91	27.17	19.8	2.50E-08	1.005	2.51E-08	*
11/19/10	17	5	300	2.97	208.91	27.17	19.8	2.50E-08	1.005	2.51E-08	*
11/19/10	17	10	300	2.97	208.91	27.17	19.8	2.50E-08	1.005	2.51E-08	*

Reported Average Hydraulic Conductivity* 2.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/19/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 21	S. Type	UD
Sample ID	10566/ST-3	Depth/Elev.	-
Location	-	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	3.036	in	7.71	cm
Diameter	2.861	in	7.27	cm
Area	6.43	in^2	41.48	cm^2
Volume	319.84	cm^3	0.0113	ft^3
Mass	609.30	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.9	pcf		

Moisture Content

Mass of wet sample & tare	609.30	g
Mass of dry sample & tare	450.40	g
Mass of tare	0.00	g
% Moisture	35.3	

Test Data

Speed	13	
Board Number	1	
Cell Number	4	
Flow Pump Number	1A	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	169.52	cm
Min Head	168.82	cm
Maximum Gradient	22.03	
Minimum Gradient	21.94	

Final Data (After Test)

Average Height of Sample			3.029	in	7.69 cm
Average Diameter of Sample			2.864	in	7.27 cm
Area	6.44	in^2	41.56	cm^2	
Volume	319.77	cm^3	0.0113	ft^3	
Mass	612.50	g	1.35	lb	

Dry Density	88.0	pcf
Vol. of Voids	155.83	cm^3
Vol. of Solids	163.94	cm^3
Void Ratio	0.95	
Saturation	103.7	%

Moisture Content

Mass of wet sample & tare	675.30	g
Mass of dry sample & tare	513.80	g
Mass of tare	63.40	g
% Moisture	35.9	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/19/10	16	45	-	2.41	169.52	22.03	19.8	-	-	-	
11/19/10	16	50	300	2.40	168.82	21.94	19.8	3.06E-08	1.005	3.08E-08	
11/19/10	16	55	300	2.40	168.82	21.94	19.8	3.07E-08	1.005	3.09E-08	
11/19/10	17	0	300	2.41	169.52	22.03	19.8	3.06E-08	1.005	3.08E-08	*
11/19/10	17	5	300	2.41	169.52	22.03	19.8	3.06E-08	1.005	3.07E-08	*
11/19/10	17	10	300	2.40	168.82	21.94	19.8	3.06E-08	1.005	3.08E-08	*
11/19/10	17	15	300	2.41	169.52	22.03	19.8	3.06E-08	1.005	3.08E-08	*

Reported Average Hydraulic Conductivity* 3.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Date	11/19/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10567/ST-4	Depth/Elev.	-
Location	-	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	3.034	in	7.71	cm
Diameter	2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2
Volume	318.29	cm^3	0.0112	ft^3
Mass	608.90	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	89.3	pcf		

Moisture Content

Mass of wet sample & tare	608.90	g
Mass of dry sample & tare	455.70	g
Mass of tare	0.00	g
% Moisture	33.6	

Test Data

Speed	13	
Board Number	2	
Cell Number	18	
Flow Pump Number	1A	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	121.69	cm
Min Head	120.98	cm
Maximum Gradient	15.81	
Minimum Gradient	15.72	

Final Data (After Test)

Average Height of Sample			3.030	in	7.70	cm
Average Diameter of Sample			2.842	in	7.22	cm
Area	6.34	in^2	40.93	cm^2		
Volume	314.98	cm^3	0.0111	ft^3		
Mass	611.20	g	1.35	lb		

Dry Density	90.3	pcf
Vol. of Voids	149.16	cm^3
Vol. of Solids	165.82	cm^3
Void Ratio	0.90	
Saturation	104.0	%

Moisture Content

Mass of wet sample & tare	684.20	g
Mass of dry sample & tare	529.10	g
Mass of tare	73.40	g
% Moisture	34.0	

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	
11/19/10	19	30	-	1.72	120.98	15.72	19.8	-	-	-	
11/19/10	19	35	300	1.73	121.69	15.81	19.8	4.34E-08	1.005	4.36E-08	
11/19/10	19	40	300	1.73	121.69	15.81	19.8	4.33E-08	1.005	4.35E-08	
11/19/10	19	45	300	1.72	120.98	15.72	19.8	4.34E-08	1.005	4.36E-08	*
11/19/10	19	50	300	1.72	120.98	15.72	19.8	4.35E-08	1.005	4.37E-08	*
11/19/10	19	55	300	1.73	121.69	15.81	19.8	4.34E-08	1.005	4.36E-08	*
11/19/10	20	0	300	1.73	121.69	15.81	19.8	4.33E-08	1.005	4.35E-08	*

Reported Average Hydraulic Conductivity* 4.4E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/19/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10568/ST-5	Depth/Elev.	-
Location	-	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	3.044	in	7.73	cm
Diameter	2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2
Volume	317.99	cm^3	0.0112	ft^3
Mass	605.20	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.3	pcf		

Moisture Content

Mass of wet sample & tare	605.20	g
Mass of dry sample & tare	449.90	g
Mass of tare	0.00	g
% Moisture	34.5	

Test Data

Speed	13	
Board Number	3	
Cell Number	10	
Flow Pump Number	1A	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	158.27	cm
Min Head	157.56	cm
Maximum Gradient	20.49	
Minimum Gradient	20.40	

Final Data (After Test)

Average Height of Sample			3.041	in	7.72 cm
Average Diameter of Sample			2.846	in	7.23 cm
Area	6.36	in^2	41.04	cm^2	
Volume	317.01	cm^3	0.0112	ft^3	
Mass	609.10	g	1.34	lb	

Dry Density	88.6	pcf
Vol. of Voids	153.28	cm^3
Vol. of Solids	163.73	cm^3
Void Ratio	0.94	
Saturation	103.6	%

Moisture Content

Mass of wet sample & tare	679.10	g
Mass of dry sample & tare	520.40	g
Mass of tare	70.50	g
% Moisture	35.3	

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	
11/19/10	17	55	-	2.25	158.27	20.49	19.8	-	-	-	
11/19/10	18	0	300	2.24	157.56	20.40	19.8	3.34E-08	1.005	3.35E-08	
11/19/10	18	5	300	2.25	158.27	20.49	19.8	3.34E-08	1.005	3.35E-08	
11/19/10	18	10	300	2.24	157.56	20.40	19.8	3.34E-08	1.005	3.35E-08	*
11/19/10	18	15	300	2.24	157.56	20.40	19.8	3.34E-08	1.005	3.36E-08	*
11/19/10	18	20	300	2.25	158.27	20.49	19.8	3.34E-08	1.005	3.35E-08	*
11/19/10	18	25	300	2.24	157.56	20.40	19.8	3.34E-08	1.005	3.35E-08	*

Reported Average Hydraulic Conductivity* 3.4E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/19/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10569/ST-6	Depth/Elev.	-
Location	-	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	3.054	in	7.76	cm
Diameter	2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2
Volume	320.16	cm^3	0.0113	ft^3
Mass	617.70	g	1.36	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	91.9	pcf		

Moisture Content

Mass of wet sample & tare	617.70	g
Mass of dry sample & tare	471.30	g
Mass of tare	0.00	g
% Moisture	31.1	

Test Data

Speed	13	
Board Number	4	
Cell Number	6	
Flow Pump Number	1B	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	165.30	cm
Min Head	164.60	cm
Maximum Gradient	21.40	
Minimum Gradient	21.31	

Final Data (After Test)

Average Height of Sample			3.041	in	7.72	cm
Average Diameter of Sample			2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2		
Volume	319.24	cm^3	0.0113	ft^3		
Mass	629.30	g	1.39	lb		

Dry Density	93.5	pcf
Vol. of Voids	145.32	cm^3
Vol. of Solids	173.92	cm^3
Void Ratio	0.84	
Saturation	103.9	%

Moisture Content

Mass of wet sample & tare	699.40	g
Mass of dry sample & tare	550.60	g
Mass of tare	79.30	g
% Moisture	31.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/19/10	17	55	-	2.34	164.60	21.31	19.8	-	-	-	
11/19/10	18	0	300	2.34	164.60	21.31	19.8	3.18E-08	1.005	3.20E-08	
11/19/10	18	5	300	2.34	164.60	21.31	19.8	3.18E-08	1.005	3.20E-08	
11/19/10	18	10	300	2.34	164.60	21.31	19.8	3.18E-08	1.005	3.20E-08	*
11/19/10	18	15	300	2.34	164.60	21.31	19.8	3.18E-08	1.005	3.20E-08	*
11/19/10	18	20	300	2.35	165.30	21.40	19.8	3.17E-08	1.005	3.19E-08	*
11/19/10	18	25	300	2.34	164.60	21.31	19.8	3.17E-08	1.005	3.19E-08	*

Reported Average Hydraulic Conductivity* 3.2E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/19/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10570/ST-7	Depth/Elev.	-
Location	-	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	3.052	in	7.75	cm
Diameter	2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2
Volume	322.20	cm^3	0.0114	ft^3
Mass	619.70	g	1.37	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.4	pcf		

Moisture Content

Mass of wet sample & tare	619.70	g
Mass of dry sample & tare	456.20	g
Mass of tare	0.00	g
% Moisture	35.8	

Test Data

Speed	13	
Board Number	11	
Cell Number	12	
Flow Pump Number	1B	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	153.34	cm
Min Head	151.93	cm
Maximum Gradient	19.90	
Minimum Gradient	19.72	

Final Data (After Test)

Average Height of Sample			3.033	in	7.70	cm
Average Diameter of Sample			2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2		
Volume	317.96	cm^3	0.0112	ft^3		
Mass	613.10	g	1.35	lb		

Dry Density	89.5	pcf
Vol. of Voids	152.04	cm^3
Vol. of Solids	165.92	cm^3
Void Ratio	0.92	
Saturation	103.1	%

Moisture Content

Mass of wet sample & tare	921.00	g
Mass of dry sample & tare	764.20	g
Mass of tare	308.00	g
% Moisture	34.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/19/10	19	30	-	2.16	151.93	19.72	19.8	-	-	-	
11/19/10	19	35	300	2.16	151.93	19.72	19.8	3.44E-08	1.005	3.46E-08	
11/19/10	19	40	300	2.17	152.64	19.81	19.8	3.43E-08	1.005	3.45E-08	
11/19/10	19	45	300	2.18	153.34	19.90	19.8	3.42E-08	1.005	3.43E-08	*
11/19/10	19	50	300	2.18	153.34	19.90	19.8	3.41E-08	1.005	3.43E-08	*
11/19/10	19	55	300	2.17	152.64	19.81	19.8	3.42E-08	1.005	3.43E-08	*
11/19/10	20	0	300	2.18	153.34	19.90	19.8	3.42E-08	1.005	3.43E-08	*

Reported Average Hydraulic Conductivity* 3.4E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/21/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10583/ST-8	Depth/Elev.	-
Location	-	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	3.069	in	7.80	cm
Diameter	2.839	in	7.21	cm
Area	6.33	in^2	40.84	cm^2
Volume	318.36	cm^3	0.0112	ft^3
Mass	613.00	g	1.35	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	90.0	pcf		

Moisture Content

Mass of wet sample & tare	613.00	g
Mass of dry sample & tare	459.00	g
Mass of tare	0.00	g
% Moisture	33.6	

Test Data

Speed	12	
Board Number	8	
Cell Number	11	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	208.91	cm
Min Head	207.50	cm
Maximum Gradient	27.02	
Minimum Gradient	26.84	

Final Data (After Test)

Average Height of Sample			3.044	in	7.73	cm
Average Diameter of Sample			2.844	in	7.22	cm
Area	6.35	in^2	40.98	cm^2		
Volume	316.88	cm^3	0.0112	ft^3		
Mass	615.50	g	1.36	lb		

Dry Density	90.4	pcf
Vol. of Voids	149.92	cm^3
Vol. of Solids	166.96	cm^3
Void Ratio	0.90	
Saturation	104.3	%

Moisture Content

Mass of wet sample & tare	920.70	g
Mass of dry sample & tare	764.40	g
Mass of tare	305.40	g
% Moisture	34.1	

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	
11/21/10	9	15	-	2.95	207.50	26.84	19.5	-	-	-	
11/21/10	9	20	300	2.96	208.21	26.93	19.5	5.08E-08	1.013	5.15E-08	
11/21/10	9	25	300	2.96	208.21	26.93	19.5	5.07E-08	1.013	5.14E-08	
11/21/10	9	30	300	2.97	208.91	27.02	19.5	5.07E-08	1.013	5.13E-08	*
11/21/10	9	35	300	2.97	208.91	27.02	19.5	5.06E-08	1.013	5.12E-08	*
11/21/10	9	40	300	2.97	208.91	27.02	19.5	5.06E-08	1.013	5.12E-08	*
11/21/10	9	45	300	2.97	208.91	27.02	19.5	5.06E-08	1.013	5.12E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/21/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 21	S. Type	UD
Sample ID	10584/ST-9	Depth/Elev.	-
Location	-	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	3.031	in	7.70	cm
Diameter	2.868	in	7.28	cm
Area	6.46	in^2	41.68	cm^2
Volume	320.87	cm^3	0.0113	ft^3
Mass	607.70	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.8	pcf		

Moisture Content

Mass of wet sample & tare	607.70	g
Mass of dry sample & tare	456.60	g
Mass of tare	0.00	g
% Moisture	33.1	

Test Data

Speed	12	
Board Number	5	
Cell Number	4	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	116.06	cm
Min Head	116.06	cm
Maximum Gradient	15.01	
Minimum Gradient	15.01	

Final Data (After Test)

Average Height of Sample			3.045	in	7.73	cm
Average Diameter of Sample			2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2		
Volume	319.66	cm^3	0.0113	ft^3		
Mass	617.80	g	1.36	lb		

Dry Density	89.2	pcf
Vol. of Voids	153.55	cm^3
Vol. of Solids	166.12	cm^3
Void Ratio	0.92	
Saturation	104.8	%

Moisture Content

Mass of wet sample & tare	918.00	g
Mass of dry sample & tare	757.10	g
Mass of tare	300.50	g
% Moisture	35.2	

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	
11/21/10	8	5	-	1.65	116.06	15.01	19.5	-	-	-	
11/21/10	8	10	300	1.65	116.06	15.01	19.5	9.03E-08	1.013	9.14E-08	
11/21/10	8	15	300	1.65	116.06	15.01	19.5	9.03E-08	1.013	9.14E-08	
11/21/10	8	20	300	1.65	116.06	15.01	19.5	9.03E-08	1.013	9.14E-08	*
11/21/10	8	25	300	1.65	116.06	15.01	19.5	9.03E-08	1.013	9.14E-08	*
11/21/10	8	30	300	1.65	116.06	15.01	19.5	9.03E-08	1.013	9.14E-08	*
11/21/10	8	35	300	1.65	116.06	15.01	19.5	9.03E-08	1.013	9.14E-08	*

Reported Average Hydraulic Conductivity* 9.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Tested By	VG
Date	11/21/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10585/ST-10	Depth/Elev.	-
Location	-	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	3.009	in	7.64	cm
Diameter	2.815	in	7.15	cm
Area	6.22	in^2	40.15	cm^2
Volume	306.88	cm^3	0.0108	ft^3
Mass	587.40	g	1.29	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.7	pcf		

Moisture Content

Mass of wet sample & tare	587.40	g
Mass of dry sample & tare	426.40	g
Mass of tare	0.00	g
% Moisture	37.8	

Test Data

Speed	12	
Board Number	6	
Cell Number	8	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	181.48	cm
Min Head	180.07	cm
Maximum Gradient	23.74	
Minimum Gradient	23.55	

Final Data (After Test)

Average Height of Sample			3.010	in	7.65 cm
Average Diameter of Sample			2.820	in	7.16 cm
Area	6.25	in^2	40.30	cm^2	
Volume	308.07	cm^3	0.0109	ft^3	
Mass	586.50	g	1.29	lb	

Dry Density	86.4	pcf
Vol. of Voids	152.94	cm^3
Vol. of Solids	155.13	cm^3
Void Ratio	0.99	
Saturation	104.5	%

Moisture Content

Mass of wet sample & tare	742.00	g
Mass of dry sample & tare	582.20	g
Mass of tare	155.80	g
% Moisture	37.5	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/21/10	8	5	-	2.57	180.77	23.64	19.5	-	-	-	
11/21/10	8	10	300	2.56	180.07	23.55	19.5	5.89E-08	1.013	5.96E-08	
11/21/10	8	15	300	2.58	181.48	23.74	19.5	5.88E-08	1.013	5.95E-08	
11/21/10	8	20	300	2.57	180.77	23.64	19.5	5.87E-08	1.013	5.94E-08	*
11/21/10	8	25	300	2.58	181.48	23.74	19.5	5.87E-08	1.013	5.94E-08	*
11/21/10	8	30	300	2.58	181.48	23.74	19.5	5.85E-08	1.013	5.93E-08	*
11/21/10	8	35	300	2.58	181.48	23.74	19.5	5.85E-08	1.013	5.93E-08	*

Reported Average Hydraulic Conductivity* 5.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/21/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2l	S. Type	UD
Sample ID	10586/ST-11	Depth/Elev.	-
Location	-	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	3.029	in	7.69	cm
Diameter	2.826	in	7.18	cm
Area	6.27	in^2	40.47	cm^2
Volume	311.34	cm^3	0.0110	ft^3
Mass	593.40	g	1.31	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.4	pcf		

Moisture Content

Mass of wet sample & tare	593.40	g
Mass of dry sample & tare	431.10	g
Mass of tare	0.00	g
% Moisture	37.6	

Test Data

Speed	13	
Board Number	1	
Cell Number	5	
Flow Pump Number	1B	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	139.27	cm
Min Head	137.87	cm
Maximum Gradient	18.04	
Minimum Gradient	17.85	

Final Data (After Test)

Average Height of Sample		3.040	in	7.72	cm
Average Diameter of Sample		2.837	in	7.21	cm
Area	6.32	in^2	40.78	cm^2	
Volume	314.91	cm^3	0.0111	ft^3	
Mass	596.80	g	1.32	lb	

Dry Density	85.5	pcf
Vol. of Voids	158.09	cm^3
Vol. of Solids	156.82	cm^3
Void Ratio	1.01	
Saturation	104.7	%

Moisture Content

Mass of wet sample & tare	751.40	g
Mass of dry sample & tare	585.90	g
Mass of tare	154.80	g
% Moisture	38.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/21/10	8	5	-	1.97	138.57	17.95	19.5	-	-	-	
11/21/10	8	10	300	1.98	139.27	18.04	19.5	3.82E-08	1.013	3.86E-08	
11/21/10	8	15	300	1.97	138.57	17.95	19.5	3.82E-08	1.013	3.86E-08	
11/21/10	8	20	300	1.96	137.87	17.85	19.5	3.84E-08	1.013	3.88E-08	*
11/21/10	8	25	300	1.98	139.27	18.04	19.5	3.83E-08	1.013	3.87E-08	*
11/21/10	8	30	300	1.98	139.27	18.04	19.5	3.81E-08	1.013	3.85E-08	*
11/21/10	8	35	300	1.98	139.27	18.04	19.5	3.81E-08	1.013	3.85E-08	*

Reported Average Hydraulic Conductivity* 3.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/21/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10587/ST-12	Depth/Elev.	-
Location	-	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	3.045	in	7.73	cm
Diameter	2.840	in	7.21	cm
Area	6.33	in^2	40.87	cm^2
Volume	316.09	cm^3	0.0112	ft^3
Mass	596.90	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.3	pcf		

Moisture Content

Mass of wet sample & tare	596.90	g
Mass of dry sample & tare	442.20	g
Mass of tare	0.00	g
% Moisture	35.0	

Test Data

Speed	13	
Board Number	2	
Cell Number	18	
Flow Pump Number	1A	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	130.83	cm
Min Head	129.43	cm
Maximum Gradient	17.02	
Minimum Gradient	16.83	

Final Data (After Test)

Average Height of Sample		3.027 in	7.69	cm
Average Diameter of Sample		2.827 in	7.18	cm
Area	6.28 in^2	40.50 cm^2		
Volume	311.35 cm^3	0.0110 ft^3		
Mass	600.40 g	1.32 lb		

Dry Density	88.7	pcf
Vol. of Voids	150.50	cm^3
Vol. of Solids	160.85	cm^3
Void Ratio	0.94	
Saturation	105.0	%

Moisture Content

Mass of wet sample & tare	673.20	g
Mass of dry sample & tare	515.20	g
Mass of tare	73.00	g
% Moisture	35.7	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/21/10	8	5	-	1.85	130.13	16.92	19.5	-	-	-	
11/21/10	8	10	300	1.84	129.43	16.83	19.5	4.10E-08	1.013	4.15E-08	
11/21/10	8	15	300	1.85	130.13	16.92	19.5	4.10E-08	1.013	4.15E-08	
11/21/10	8	20	300	1.86	130.83	17.02	19.5	4.07E-08	1.013	4.13E-08	*
11/21/10	8	25	300	1.86	130.83	17.02	19.5	4.06E-08	1.013	4.11E-08	*
11/21/10	8	30	300	1.86	130.83	17.02	19.5	4.06E-08	1.013	4.11E-08	*
11/21/10	8	35	300	1.86	130.83	17.02	19.5	4.06E-08	1.013	4.11E-08	*

Reported Average Hydraulic Conductivity* 4.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/21/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10588/ST-13	Depth/Elev.	-
Location	-	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	3.048	in	7.74	cm
Diameter	2.812	in	7.14	cm
Area	6.21	in^2	40.07	cm^2
Volume	310.20	cm^3	0.0110	ft^3
Mass	588.50	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.3	pcf		

Moisture Content

Mass of wet sample & tare	588.50	g
Mass of dry sample & tare	429.20	g
Mass of tare	0.00	g
% Moisture	37.1	

Test Data

Speed	12	
Board Number	3	
Cell Number	10	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	218.05	cm
Min Head	216.65	cm
Maximum Gradient	28.14	
Minimum Gradient	27.96	

Final Data (After Test)

Average Height of Sample			3.051	in	7.75	cm
Average Diameter of Sample			2.839	in	7.21	cm
Area	6.33	in^2	40.84	cm^2		
Volume	316.49	cm^3	0.0112	ft^3		
Mass	592.70	g	1.31	lb		

Dry Density	84.6	pcf
Vol. of Voids	160.39	cm^3
Vol. of Solids	156.10	cm^3
Void Ratio	1.03	
Saturation	101.9	%

Moisture Content

Mass of wet sample & tare	894.70	g
Mass of dry sample & tare	731.30	g
Mass of tare	302.10	g
% Moisture	38.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/21/10	9	15	-	3.08	216.65	27.96	19.5	-	-	-	
11/21/10	9	20	300	3.09	217.35	28.05	19.5	4.90E-08	1.013	4.96E-08	
11/21/10	9	25	300	3.10	218.05	28.14	19.5	4.88E-08	1.013	4.94E-08	
11/21/10	9	30	300	3.10	218.05	28.14	19.5	4.87E-08	1.013	4.93E-08	*
11/21/10	9	35	300	3.10	218.05	28.14	19.5	4.87E-08	1.013	4.93E-08	*
11/21/10	9	40	300	3.10	218.05	28.14	19.5	4.87E-08	1.013	4.93E-08	*
11/21/10	9	45	300	3.10	218.05	28.14	19.5	4.87E-08	1.013	4.93E-08	*

Reported Average Hydraulic Conductivity* 4.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAP AASHTO R18

Tested By	VG
Date	11/21/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10589/ST-14	Depth/Elev.	-
Location	-	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	3.045	in	7.73	cm
Diameter	2.824	in	7.17	cm
Area	6.26	in^2	40.41	cm^2
Volume	312.54	cm^3	0.0110	ft^3
Mass	596.50	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.5	pcf		

Moisture Content

Mass of wet sample & tare	596.50	g
Mass of dry sample & tare	438.20	g
Mass of tare	0.00	g
% Moisture	36.1	

Test Data

Speed	13	
Board Number	11	
Cell Number	7	
Flow Pump Number	1B	
Flow Pump Rate	2.80E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	143.49	cm
Min Head	141.38	cm
Maximum Gradient	18.58	
Minimum Gradient	18.31	

Final Data (After Test)

Average Height of Sample			3.040	in	7.72 cm
Average Diameter of Sample			2.840	in	7.21 cm
Area	6.33	in^2	40.87	cm^2	
Volume	315.57	cm^3	0.0111	ft^3	
Mass	601.40	g	1.33	lb	

Dry Density	86.7	pcf
Vol. of Voids	156.20	cm^3
Vol. of Solids	159.37	cm^3
Void Ratio	0.98	
Saturation	104.4	%

Moisture Content

Mass of wet sample & tare	677.00	g
Mass of dry sample & tare	513.90	g
Mass of tare	75.70	g
% Moisture	37.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/21/10	11	10	-	2.02	142.09	18.40	19.5	-	-	-	
11/21/10	11	15	300	2.01	141.38	18.31	19.5	3.73E-08	1.013	3.78E-08	
11/21/10	11	20	300	2.03	142.79	18.49	19.5	3.72E-08	1.013	3.77E-08	
11/21/10	11	25	300	2.04	143.49	18.58	19.5	3.70E-08	1.013	3.74E-08	*
11/21/10	11	30	300	2.02	142.09	18.40	19.5	3.70E-08	1.013	3.75E-08	*
11/21/10	11	35	300	2.02	142.09	18.40	19.5	3.72E-08	1.013	3.77E-08	*
11/21/10	11	40	300	2.02	142.09	18.40	19.5	3.72E-08	1.013	3.77E-08	*

Reported Average Hydraulic Conductivity* 3.8E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/21/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10590/ST-15	Depth/Elev.	-
Location	-	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	3.009	in	7.64	cm
Diameter	2.838	in	7.21	cm
Area	6.33	in^2	40.81	cm^2
Volume	311.92	cm^3	0.0110	ft^3
Mass	616.50	g	1.36	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	96.8	pcf		

Moisture Content

Mass of wet sample & tare	616.50	g
Mass of dry sample & tare	484.00	g
Mass of tare	0.00	g
% Moisture	27.4	

Test Data

Speed	12	
Board Number	4	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	213.13	cm
Min Head	211.72	cm
Maximum Gradient	27.69	
Minimum Gradient	27.51	

Final Data (After Test)

Average Height of Sample			3.030	in	7.70	cm
Average Diameter of Sample			2.843	in	7.22	cm
Area	6.35	in^2	40.96	cm^2		
Volume	315.20	cm^3	0.0111	ft^3		
Mass	629.70	g	1.39	lb		

Dry Density	95.8	pcf
Vol. of Voids	139.20	cm^3
Vol. of Solids	176.00	cm^3
Void Ratio	0.79	
Saturation	104.7	%

Moisture Content

Mass of wet sample & tare	938.20	g
Mass of dry sample & tare	792.50	g
Mass of tare	308.50	g
% Moisture	30.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/21/10	9	15	-	3.02	212.43	27.60	19.5	-	-	-	
11/21/10	9	20	300	3.03	213.13	27.69	19.5	4.95E-08	1.013	5.01E-08	
11/21/10	9	25	300	3.01	211.72	27.51	19.5	4.95E-08	1.013	5.02E-08	
11/21/10	9	30	300	3.01	211.72	27.51	19.5	4.97E-08	1.013	5.03E-08	*
11/21/10	9	35	300	3.01	211.72	27.51	19.5	4.97E-08	1.013	5.03E-08	*
11/21/10	9	40	300	3.01	211.72	27.51	19.5	4.97E-08	1.013	5.03E-08	*
11/21/10	9	45	300	3.01	211.72	27.51	19.5	4.97E-08	1.013	5.03E-08	*

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Reported Average Hydraulic Conductivity* 5.0E-08 cm/sec

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10591/ST-16	Depth/Elev.	-
Location	-	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	3.036	in	7.71	cm
Diameter	2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2
Volume	317.16	cm^3	0.0112	ft^3
Mass	589.40	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.1	pcf		

Moisture Content

Mass of wet sample & tare	589.40	g
Mass of dry sample & tare	437.40	g
Mass of tare	0.00	g
% Moisture	34.8	

Test Data

Speed	12	
Board Number	7	
Cell Number	11	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	135.05	cm
Min Head	134.35	cm
Maximum Gradient	17.46	
Minimum Gradient	17.37	

Final Data (After Test)

Average Height of Sample			3.045	in	7.73	cm
Average Diameter of Sample			2.837	in	7.21	cm
Area	6.32	in^2	40.78	cm^2		
Volume	315.43	cm^3	0.0111	ft^3		
Mass	599.50	g	1.32	lb		

Dry Density	86.5	pcf
Vol. of Voids	156.37	cm^3
Vol. of Solids	159.05	cm^3
Void Ratio	0.98	
Saturation	103.7	%

Moisture Content

Mass of wet sample & tare	693.30	g
Mass of dry sample & tare	531.20	g
Mass of tare	93.80	g
% Moisture	37.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	9	55	-	1.92	135.05	17.46	20.0	-	-	-	
11/23/10	10	0	300	1.91	134.35	17.37	20.0	7.88E-08	1.000	7.89E-08	
11/23/10	10	5	300	1.91	134.35	17.37	20.0	7.90E-08	1.000	7.91E-08	
11/23/10	10	10	300	1.92	135.05	17.46	20.0	7.88E-08	1.000	7.89E-08	*
11/23/10	10	15	300	1.91	134.35	17.37	20.0	7.88E-08	1.000	7.89E-08	*
11/23/10	10	20	300	1.92	135.05	17.46	20.0	7.88E-08	1.000	7.89E-08	*
11/23/10	10	25	300	1.92	135.05	17.46	20.0	7.86E-08	1.000	7.87E-08	*

Reported Average Hydraulic Conductivity* 7.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	262
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	245			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/23/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2l	S. Type	UD
Sample ID	10592/ST-17	Depth/Elev.	-
Location	-	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	3.045	in	7.73	cm
Diameter	2.851	in	7.24	cm
Area	6.38	in^2	41.19	cm^2
Volume	318.55	cm^3	0.0112	ft^3
Mass	593.30	g	1.31	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	85.1	pcf		

Moisture Content

Mass of wet sample & tare	593.30	g
Mass of dry sample & tare	434.40	g
Mass of tare	0.00	g
% Moisture	36.6	

Test Data

Speed	12	
Board Number	8	
Cell Number	12	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	206.10	cm
Min Head	205.39	cm
Maximum Gradient	26.79	
Minimum Gradient	26.70	

Final Data (After Test)

Average Height of Sample			3.029	in	7.69	cm
Average Diameter of Sample			2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2		
Volume	316.65	cm^3	0.0112	ft^3		
Mass	597.10	g	1.32	lb		

Dry Density	85.7	pcf
Vol. of Voids	158.58	cm^3
Vol. of Solids	158.07	cm^3
Void Ratio	1.00	
Saturation	102.4	%

Moisture Content

Mass of wet sample & tare	709.20	g
Mass of dry sample & tare	546.90	g
Mass of tare	112.50	g
% Moisture	37.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	9	55	-	2.93	206.10	26.79	20.0	-	-	-	
11/23/10	10	0	300	2.92	205.39	26.70	20.0	5.09E-08	1.000	5.09E-08	
11/23/10	10	5	300	2.92	205.39	26.70	20.0	5.10E-08	1.000	5.10E-08	
11/23/10	10	10	300	2.93	206.10	26.79	20.0	5.09E-08	1.000	5.09E-08	*
11/23/10	10	15	300	2.93	206.10	26.79	20.0	5.08E-08	1.000	5.08E-08	*
11/23/10	10	20	300	2.92	205.39	26.70	20.0	5.09E-08	1.000	5.09E-08	*
11/23/10	10	25	300	2.93	206.10	26.79	20.0	5.09E-08	1.000	5.09E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/23/10
Checked By	VS

Client Pr. #	-	Lab. PR. #	1008-16-4
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10593/ST-18	Depth/Elev.	-
Location	-	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	3.046	in	7.74	cm
Diameter	2.842	in	7.22	cm
Area	6.34	in^2	40.93	cm^2
Volume	316.64	cm^3	0.0112	ft^3
Mass	594.00	g	1.31	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.0	pcf		

Moisture Content

Mass of wet sample & tare	594.00	g
Mass of dry sample & tare	436.20	g
Mass of tare	0.00	g
% Moisture	36.2	

Test Data

Speed	12	
Board Number	2	
Cell Number	4	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	208.21	cm
Min Head	207.50	cm
Maximum Gradient	27.05	
Minimum Gradient	26.96	

Final Data (After Test)

Average Height of Sample			3.030	in	7.70	cm
Average Diameter of Sample			2.842	in	7.22	cm
Area	6.34	in^2	40.93	cm^2		
Volume	314.98	cm^3	0.0111	ft^3		
Mass	598.60	g	1.32	lb		

Dry Density	86.5	pcf
Vol. of Voids	156.23	cm^3
Vol. of Solids	158.75	cm^3
Void Ratio	0.98	
Saturation	103.7	%

Moisture Content

Mass of wet sample & tare	670.90	g
Mass of dry sample & tare	509.00	g
Mass of tare	72.80	g
% Moisture	37.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	8	55	-	2.96	208.21	27.05	20.0	-	-	-	
11/23/10	9	0	300	2.96	208.21	27.05	20.0	5.06E-08	1.000	5.06E-08	
11/23/10	9	5	300	2.95	207.50	26.96	20.0	5.07E-08	1.000	5.07E-08	
11/23/10	9	10	300	2.96	208.21	27.05	20.0	5.07E-08	1.000	5.07E-08	*
11/23/10	9	15	300	2.95	207.50	26.96	20.0	5.07E-08	1.000	5.07E-08	*
11/23/10	9	20	300	2.95	207.50	26.96	20.0	5.07E-08	1.000	5.08E-08	*
11/23/10	9	25	300	2.96	208.21	27.05	20.0	5.07E-08	1.000	5.07E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	262
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	245			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10600/ST-19	Depth/Elev.	-
Location	-	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	3.044	in	7.73	cm
Diameter	2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2
Volume	317.99	cm^3	0.0112	ft^3
Mass	591.50	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.1	pcf		

Moisture Content

Mass of wet sample & tare	591.50	g
Mass of dry sample & tare	449.10	g
Mass of tare	0.00	g
% Moisture	31.7	

Test Data

Speed	12	
Board Number	8	
Cell Number	12	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	114.65	cm
Min Head	113.95	cm
Maximum Gradient	14.59	
Minimum Gradient	14.50	

Final Data (After Test)

Average Height of Sample			3.093	in	7.86	cm
Average Diameter of Sample			2.877	in	7.31	cm
Area	6.50	in^2	41.94	cm^2		
Volume	329.50	cm^3	0.0116	ft^3		
Mass	611.10	g	1.35	lb		

Dry Density	85.1	pcf
Vol. of Voids	166.19	cm^3
Vol. of Solids	163.31	cm^3
Void Ratio	1.02	
Saturation	97.5	%

Moisture Content

Mass of wet sample & tare	715.20	g
Mass of dry sample & tare	553.20	g
Mass of tare	104.10	g
% Moisture	36.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	14	50	-	1.62	113.95	14.50	21.4	-	-	-	
11/23/10	14	55	300	1.63	114.65	14.59	21.4	9.18E-08	0.967	8.87E-08	
11/23/10	15	0	300	1.62	113.95	14.50	21.4	9.18E-08	0.967	8.87E-08	
11/23/10	15	5	300	1.62	113.95	14.50	21.4	9.21E-08	0.967	8.90E-08	*
11/23/10	15	10	300	1.62	113.95	14.50	21.4	9.21E-08	0.967	8.90E-08	*
11/23/10	15	15	300	1.62	113.95	14.50	21.4	9.21E-08	0.967	8.90E-08	*
11/23/10	15	20	300	1.62	113.95	14.50	21.4	9.21E-08	0.967	8.90E-08	*

Reported Average Hydraulic Conductivity* 8.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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AAR AASHTO R18

Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10601/ST-20	Depth/Elev.	-
Location	-	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	3.054	in	7.76	cm
Diameter	2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2
Volume	322.41	cm^3	0.0114	ft^3
Mass	612.40	g	1.35	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	91.2	pcf		

Moisture Content

Mass of wet sample & tare	612.40	g
Mass of dry sample & tare	471.30	g
Mass of tare	0.00	g
% Moisture	29.9	

Test Data

Speed	12	
Board Number	5	
Cell Number	4	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	128.02	cm
Min Head	127.32	cm
Maximum Gradient	16.45	
Minimum Gradient	16.36	

Final Data (After Test)

Average Height of Sample			3.064	in	7.78	cm
Average Diameter of Sample			2.860	in	7.26	cm
Area	6.42	in^2	41.45	cm^2		
Volume	322.56	cm^3	0.0114	ft^3		
Mass	621.50	g	1.37	lb		

Dry Density	91.2	pcf
Vol. of Voids	151.18	cm^3
Vol. of Solids	171.38	cm^3
Void Ratio	0.88	
Saturation	99.4	%

Moisture Content

Mass of wet sample & tare	723.30	g
Mass of dry sample & tare	573.10	g
Mass of tare	101.80	g
% Moisture	31.9	

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	
11/23/10	16	30	-	1.81	127.32	16.36	21.4	-	-	-	
11/23/10	16	35	300	1.82	128.02	16.45	21.4	8.24E-08	0.967	7.96E-08	
11/23/10	16	40	300	1.82	128.02	16.45	21.4	8.21E-08	0.967	7.94E-08	
11/23/10	16	45	300	1.82	128.02	16.45	21.4	8.21E-08	0.967	7.94E-08	*
11/23/10	16	50	300	1.81	127.32	16.36	21.4	8.24E-08	0.967	7.96E-08	*
11/23/10	16	55	300	1.82	128.02	16.45	21.4	8.24E-08	0.967	7.96E-08	*
11/23/10	17	0	300	1.81	127.32	16.36	21.4	8.24E-08	0.967	7.96E-08	*

Reported Average Hydraulic Conductivity* 8.0E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Tested By	VG
Date	11/23/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10602/ST-21	Depth/Elev.	-
Location	-	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	3.033	in	7.70	cm
Diameter	2.842	in	7.22	cm
Area	6.34	in^2	40.93	cm^2
Volume	315.29	cm^3	0.0111	ft^3
Mass	619.80	g	1.37	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	94.8	pcf		

Moisture Content

Mass of wet sample & tare	619.80	g
Mass of dry sample & tare	479.10	g
Mass of tare	0.00	g
% Moisture	29.4	

Test Data

Speed	12	
Board Number	6	
Cell Number	8	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	203.28	cm
Min Head	202.58	cm
Maximum Gradient	26.28	
Minimum Gradient	26.19	

Final Data (After Test)

Average Height of Sample			3.045	in	7.73 cm
Average Diameter of Sample			2.856	in	7.25 cm
Area	6.41	in^2	41.33	cm^2	
Volume	319.66	cm^3	0.0113	ft^3	
Mass	624.00	g	1.38	lb	

Dry Density	93.5	pcf
Vol. of Voids	145.45	cm^3
Vol. of Solids	174.22	cm^3
Void Ratio	0.83	
Saturation	99.6	%

Moisture Content

Mass of wet sample & tare	700.90	g
Mass of dry sample & tare	556.00	g
Mass of tare	76.90	g
% Moisture	30.2	

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	
11/23/10	16	30	-	2.88	202.58	26.19	21.4	-	-	-	
11/23/10	16	35	300	2.89	203.28	26.28	21.4	5.16E-08	0.967	4.99E-08	
11/23/10	16	40	300	2.88	202.58	26.19	21.4	5.16E-08	0.967	4.99E-08	
11/23/10	16	45	300	2.89	203.28	26.28	21.4	5.16E-08	0.967	4.99E-08	*
11/23/10	16	50	300	2.89	203.28	26.28	21.4	5.16E-08	0.967	4.98E-08	*
11/23/10	16	55	300	2.88	202.58	26.19	21.4	5.16E-08	0.967	4.99E-08	*
11/23/10	17	0	300	2.88	202.58	26.19	21.4	5.17E-08	0.967	5.00E-08	*

Reported Average Hydraulic Conductivity* 5.0E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2l	S. Type	UD
Sample ID	10603/ST-22	Depth/Elev.	-
Location	-	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	3.047	in	7.74	cm
Diameter	2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2
Volume	319.87	cm^3	0.0113	ft^3
Mass	608.20	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	89.8	pcf		

Moisture Content

Mass of wet sample & tare	608.20	g
Mass of dry sample & tare	460.20	g
Mass of tare	0.00	g
% Moisture	32.2	

Test Data

Speed	12	
Board Number	1	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	156.86	cm
Min Head	156.15	cm
Maximum Gradient	20.30	
Minimum Gradient	20.21	

Final Data (After Test)

Average Height of Sample			3.042	in	7.73	cm
Average Diameter of Sample			2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2		
Volume	321.14	cm^3	0.0113	ft^3		
Mass	612.70	g	1.35	lb		

Dry Density	89.4	pcf
Vol. of Voids	153.77	cm^3
Vol. of Solids	167.37	cm^3
Void Ratio	0.92	
Saturation	99.1	%

Moisture Content

Mass of wet sample & tare	718.50	g
Mass of dry sample & tare	566.10	g
Mass of tare	105.90	g
% Moisture	33.1	

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	
11/23/10	14	25	-	2.22	156.15	20.21	20.0	-	-	-	
11/23/10	14	30	300	2.23	156.86	20.30	20.0	6.65E-08	1.000	6.65E-08	
11/23/10	14	35	300	2.23	156.86	20.30	20.0	6.64E-08	1.000	6.64E-08	
11/23/10	14	40	300	2.23	156.86	20.30	20.0	6.64E-08	1.000	6.64E-08	*
11/23/10	14	45	300	2.22	156.15	20.21	20.0	6.65E-08	1.000	6.65E-08	*
11/23/10	14	50	300	2.23	156.86	20.30	20.0	6.65E-08	1.000	6.65E-08	*
11/23/10	14	55	300	2.22	156.15	20.21	20.0	6.65E-08	1.000	6.65E-08	*

Reported Average Hydraulic Conductivity* 6.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2l	S. Type	UD
Sample ID	10604/ST-23	Depth/Elev.	-
Location	-	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	3.045	in	7.73	cm
Diameter	2.842	in	7.22	cm
Area	6.34	in^2	40.93	cm^2
Volume	316.54	cm^3	0.0112	ft^3
Mass	598.30	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	89.4	pcf		

Moisture Content

Mass of wet sample & tare	598.30	g
Mass of dry sample & tare	453.60	g
Mass of tare	0.00	g
% Moisture	31.9	

Test Data

Speed	12	
Board Number	2	
Cell Number	18	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	167.41	cm
Min Head	165.30	cm
Maximum Gradient	21.55	
Minimum Gradient	21.28	

Final Data (After Test)

Average Height of Sample			3.058 in	7.77 cm
Average Diameter of Sample			2.853 in	7.25 cm
Area	6.39	in^2	41.24 cm^2	
Volume	320.36	cm^3	0.0113 ft^3	
Mass	607.80	g	1.34 lb	

Dry Density	88.4	pcf
Vol. of Voids	155.38	cm^3
Vol. of Solids	164.97	cm^3
Void Ratio	0.94	
Saturation	99.2	%

Moisture Content

Mass of wet sample & tare	703.10	g
Mass of dry sample & tare	549.00	g
Mass of tare	95.40	g
% Moisture	34.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	14	25	-	2.36	166.00	21.37	21.4	-	-	-	
11/23/10	14	30	300	2.35	165.30	21.28	21.4	6.37E-08	0.967	6.16E-08	
11/23/10	14	35	300	2.36	166.00	21.37	21.4	6.37E-08	0.967	6.16E-08	
11/23/10	14	40	300	2.35	165.30	21.28	21.4	6.37E-08	0.967	6.16E-08	*
11/23/10	14	45	300	2.38	167.41	21.55	21.4	6.34E-08	0.967	6.13E-08	*
11/23/10	14	50	300	2.38	167.41	21.55	21.4	6.30E-08	0.967	6.09E-08	*
11/23/10	14	55	300	2.36	166.00	21.37	21.4	6.33E-08	0.967	6.12E-08	*

Reported Average Hydraulic Conductivity* 6.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10605/ST-24	Depth/Elev.	-
Location	-	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	3.042	in	7.73	cm
Diameter	2.843	in	7.22	cm
Area	6.35	in^2	40.96	cm^2
Volume	316.45	cm^3	0.0112	ft^3
Mass	589.10	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	84.7	pcf		

Moisture Content

Mass of wet sample & tare	589.10	g
Mass of dry sample & tare	429.50	g
Mass of tare	0.00	g
% Moisture	37.2	

Test Data

Speed	12	
Board Number	3	
Cell Number	9	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	134.35	cm
Min Head	132.94	cm
Maximum Gradient	17.35	
Minimum Gradient	17.17	

Final Data (After Test)

Average Height of Sample			3.048	in	7.74	cm
Average Diameter of Sample			2.858	in	7.26	cm
Area	6.42	in^2	41.39	cm^2		
Volume	320.43	cm^3	0.0113	ft^3		
Mass	592.10	g	1.31	lb		

Dry Density	83.6	pcf
Vol. of Voids	164.25	cm^3
Vol. of Solids	156.18	cm^3
Void Ratio	1.05	
Saturation	99.0	%

Moisture Content

Mass of wet sample & tare	699.40	g
Mass of dry sample & tare	536.80	g
Mass of tare	107.30	g
% Moisture	37.9	

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	
11/23/10	15	20	-	1.89	132.94	17.17	21.4	-	-	-	
11/23/10	15	25	300	1.90	133.65	17.26	21.4	7.86E-08	0.967	7.60E-08	
11/23/10	15	30	300	1.91	134.35	17.35	21.4	7.82E-08	0.967	7.56E-08	
11/23/10	15	35	300	1.91	134.35	17.35	21.4	7.80E-08	0.967	7.54E-08	*
11/23/10	15	40	300	1.91	134.35	17.35	21.4	7.80E-08	0.967	7.54E-08	*
11/23/10	15	45	300	1.91	134.35	17.35	21.4	7.80E-08	0.967	7.54E-08	*
11/23/10	15	50	300	1.91	134.35	17.35	21.4	7.80E-08	0.967	7.54E-08	*

Reported Average Hydraulic Conductivity* 7.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10606/ST-25	Depth/Elev.	-
Location	-	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	3.040	in	7.72	cm
Diameter	2.841	in	7.22	cm
Area	6.34	in^2	40.90	cm^2
Volume	315.80	cm^3	0.0112	ft^3
Mass	581.30	g	1.28	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	81.3	pcf		

Moisture Content

Mass of wet sample & tare	581.30	g
Mass of dry sample & tare	411.20	g
Mass of tare	0.00	g
% Moisture	41.4	

Test Data

Speed	12	
Board Number	4	
Cell Number	10	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	120.28	cm
Min Head	118.87	cm
Maximum Gradient	15.47	
Minimum Gradient	15.28	

Final Data (After Test)

Average Height of Sample			3.062	in	7.78 cm
Average Diameter of Sample			2.865	in	7.28 cm
Area	6.45	in^2	41.59	cm^2	
Volume	323.48	cm^3	0.0114	ft^3	
Mass	585.00	g	1.29	lb	

Dry Density	79.3	pcf
Vol. of Voids	173.93	cm^3
Vol. of Solids	149.55	cm^3
Void Ratio	1.16	
Saturation	99.9	%

Moisture Content

Mass of wet sample & tare	693.30	g
Mass of dry sample & tare	519.60	g
Mass of tare	108.40	g
% Moisture	42.2	

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	
11/23/10	15	20	-	1.69	118.87	15.28	21.4	-	-	-	
11/23/10	15	25	300	1.70	119.58	15.37	21.4	8.78E-08	0.967	8.49E-08	
11/23/10	15	30	300	1.71	120.28	15.47	21.4	8.73E-08	0.967	8.44E-08	
11/23/10	15	35	300	1.70	119.58	15.37	21.4	8.73E-08	0.967	8.44E-08	*
11/23/10	15	40	300	1.70	119.58	15.37	21.4	8.76E-08	0.967	8.47E-08	*
11/23/10	15	45	300	1.70	119.58	15.37	21.4	8.76E-08	0.967	8.47E-08	*
11/23/10	15	50	300	1.70	119.58	15.37	21.4	8.76E-08	0.967	8.47E-08	*

Reported Average Hydraulic Conductivity* 8.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	246			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10607/ST-26	Depth/Elev.	-
Location	-	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	3.034	in	7.71	cm
Diameter	2.847	in	7.23	cm
Area	6.37	in^2	41.07	cm^2
Volume	316.51	cm^3	0.0112	ft^3
Mass	593.50	g	1.31	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	84.8	pcf		

Moisture Content

Mass of wet sample & tare	593.50	g
Mass of dry sample & tare	430.10	g
Mass of tare	0.00	g
% Moisture	38.0	

Test Data

Speed	12	
Board Number	11	
Cell Number	6	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	192.03	cm
Min Head	191.32	cm
Maximum Gradient	24.88	
Minimum Gradient	24.79	

Final Data (After Test)

Average Height of Sample		3.039	in	7.72	cm
Average Diameter of Sample		2.851	in	7.24	cm
Area	6.38	in^2	41.19	cm^2	
Volume	317.92	cm^3	0.0112	ft^3	
Mass	595.70	g	1.31	lb	

Dry Density	85.1	pcf
Vol. of Voids	160.19	cm^3
Vol. of Solids	157.72	cm^3
Void Ratio	1.02	
Saturation	101.1	%

Moisture Content

Mass of wet sample & tare	669.80	g
Mass of dry sample & tare	509.20	g
Mass of tare	79.10	g
% Moisture	37.3	

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	
11/23/10	16	40	-	2.72	191.32	24.79	21.4	-	-	-	
11/23/10	16	45	300	2.73	192.03	24.88	21.4	5.48E-08	0.967	5.29E-08	
11/23/10	16	50	300	2.72	191.32	24.79	21.4	5.48E-08	0.967	5.29E-08	
11/23/10	16	55	300	2.72	191.32	24.79	21.4	5.49E-08	0.967	5.30E-08	*
11/23/10	17	0	300	2.73	192.03	24.88	21.4	5.48E-08	0.967	5.29E-08	*
11/23/10	17	5	300	2.73	192.03	24.88	21.4	5.47E-08	0.967	5.29E-08	*
11/23/10	17	10	300	2.73	192.03	24.88	21.4	5.47E-08	0.967	5.29E-08	*

Reported Average Hydraulic Conductivity* 5.3E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	140			Pore Pressure Transducer ID #	28

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AAP AASHTO R18

Tested By	VG
Date	11/23/10
Checked By	CB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10608/ST-27	Depth/Elev.	-
Location	-	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	3.043	in	7.73	cm
Diameter	2.837	in	7.21	cm
Area	6.32	in^2	40.78	cm^2
Volume	315.22	cm^3	0.0111	ft^3
Mass	601.10	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	89.6	pcf		

Moisture Content

Mass of wet sample & tare	601.10	g
Mass of dry sample & tare	452.70	g
Mass of tare	0.00	g
% Moisture	32.8	

Test Data

Speed	12	
Board Number	12	
Cell Number	7	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	186.40	cm
Min Head	185.70	cm
Maximum Gradient	24.07	
Minimum Gradient	23.98	

Final Data (After Test)

Average Height of Sample			3.049	in	7.74 cm
Average Diameter of Sample			2.842	in	7.22 cm
Area	6.34	in^2	40.93	cm^2	
Volume	316.95	cm^3	0.0112	ft^3	
Mass	604.80	g	1.33	lb	

Dry Density	89.1	pcf
Vol. of Voids	152.31	cm^3
Vol. of Solids	164.65	cm^3
Void Ratio	0.93	
Saturation	99.8	%

Moisture Content

Mass of wet sample & tare	674.50	g
Mass of dry sample & tare	522.50	g
Mass of tare	69.80	g
% Moisture	33.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	16	40	-	2.64	185.70	23.98	21.4	-	-	-	
11/23/10	16	45	300	2.64	185.70	23.98	21.4	5.71E-08	0.967	5.52E-08	
11/23/10	16	50	300	2.64	185.70	23.98	21.4	5.71E-08	0.967	5.52E-08	
11/23/10	16	55	300	2.65	186.40	24.07	21.4	5.70E-08	0.967	5.51E-08	*
11/23/10	17	0	300	2.64	185.70	23.98	21.4	5.70E-08	0.967	5.51E-08	*
11/23/10	17	5	300	2.65	186.40	24.07	21.4	5.70E-08	0.967	5.51E-08	*
11/23/10	17	10	300	2.65	186.40	24.07	21.4	5.68E-08	0.967	5.50E-08	*

Reported Average Hydraulic Conductivity* 5.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10609/ST-28	Depth/Elev.	-
Location	-	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	3.034	in	7.71	cm
Diameter	2.847	in	7.23	cm
Area	6.37	in^2	41.07	cm^2
Volume	316.51	cm^3	0.0112	ft^3
Mass	625.20	g	1.38	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	94.1	pcf		

Moisture Content

Mass of wet sample & tare	625.20	g
Mass of dry sample & tare	477.50	g
Mass of tare	0.00	g
% Moisture	30.9	

Test Data

Speed	12	
Board Number	1	
Cell Number	3	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	213.13	cm
Min Head	211.72	cm
Maximum Gradient	27.67	
Minimum Gradient	27.48	

Final Data (After Test)

Average Height of Sample			3.033	in	7.70	cm
Average Diameter of Sample			2.866	in	7.28	cm
Area	6.45	in^2	41.62	cm^2		
Volume	320.64	cm^3	0.0113	ft^3		
Mass	626.20	g	1.38	lb		

Dry Density	92.9	pcf
Vol. of Voids	146.97	cm^3
Vol. of Solids	173.66	cm^3
Void Ratio	0.85	
Saturation	101.1	%

Moisture Content

Mass of wet sample & tare	700.10	g
Mass of dry sample & tare	551.50	g
Mass of tare	74.00	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	
11/23/10	18	10	-	3.02	212.43	27.57	21.5	-	-	-	
11/23/10	18	15	300	3.03	213.13	27.67	21.5	4.87E-08	0.965	4.70E-08	
11/23/10	18	20	300	3.01	211.72	27.48	21.5	4.88E-08	0.965	4.71E-08	
11/23/10	18	25	300	3.01	211.72	27.48	21.5	4.90E-08	0.965	4.72E-08	*
11/23/10	18	30	300	3.01	211.72	27.48	21.5	4.90E-08	0.965	4.72E-08	*
11/23/10	18	35	300	3.01	211.72	27.48	21.5	4.90E-08	0.965	4.72E-08	*
11/23/10	18	40	300	3.01	211.72	27.48	21.5	4.90E-08	0.965	4.72E-08	*

Reported Average Hydraulic Conductivity* 4.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10610/ST-29	Depth/Elev.	-
Location	-	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	3.035	in	7.71	cm
Diameter	2.862	in	7.27	cm
Area	6.43	in^2	41.50	cm^2
Volume	319.95	cm^3	0.0113	ft^3
Mass	597.60	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	84.7	pcf		

Moisture Content

Mass of wet sample & tare	597.60	g
Mass of dry sample & tare	434.40	g
Mass of tare	0.00	g
% Moisture	37.6	

Test Data

Speed	12	
Board Number	2	
Cell Number	18	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	147.01	cm
Min Head	144.90	cm
Maximum Gradient	19.20	
Minimum Gradient	18.92	

Final Data (After Test)

Average Height of Sample			3.015	in	7.66	cm
Average Diameter of Sample			2.859	in	7.26	cm
Area	6.42	in^2	41.42	cm^2		
Volume	317.18	cm^3	0.0112	ft^3		
Mass	598.40	g	1.32	lb		

Dry Density	85.5	pcf
Vol. of Voids	159.19	cm^3
Vol. of Solids	157.99	cm^3
Void Ratio	1.01	
Saturation	103.0	%

Moisture Content

Mass of wet sample & tare	697.00	g
Mass of dry sample & tare	533.10	g
Mass of tare	98.70	g
% Moisture	37.7	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	18	10	-	2.06	144.90	18.92	21.5	-	-	-	
11/23/10	18	15	300	2.07	145.60	19.01	21.5	7.13E-08	0.965	6.88E-08	
11/23/10	18	20	300	2.08	146.31	19.10	21.5	7.09E-08	0.965	6.84E-08	
11/23/10	18	25	300	2.08	146.31	19.10	21.5	7.08E-08	0.965	6.83E-08	*
11/23/10	18	30	300	2.07	145.60	19.01	21.5	7.09E-08	0.965	6.84E-08	*
11/23/10	18	35	300	2.08	146.31	19.10	21.5	7.09E-08	0.965	6.84E-08	*
11/23/10	18	40	300	2.09	147.01	19.20	21.5	7.06E-08	0.965	6.81E-08	*

Reported Average Hydraulic Conductivity* 6.8E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10611/ST-30	Depth/Elev.	-
Location	-	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	3.043	in	7.73	cm
Diameter	2.845	in	7.23	cm
Area	6.36	in^2	41.01	cm^2
Volume	317.00	cm^3	0.0112	ft^3
Mass	601.70	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.7	pcf		

Moisture Content

Mass of wet sample & tare	601.70	g
Mass of dry sample & tare	450.80	g
Mass of tare	0.00	g
% Moisture	33.5	

Test Data

Speed	12	
Board Number	7	
Cell Number	12	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	116.76	cm
Min Head	115.36	cm
Maximum Gradient	15.19	
Minimum Gradient	15.01	

Final Data (After Test)

Average Height of Sample			3.026	in	7.69	cm
Average Diameter of Sample			2.837	in	7.21	cm
Area	6.32	in^2	40.78	cm^2		
Volume	313.46	cm^3	0.0111	ft^3		
Mass	604.00	g	1.33	lb		

Dry Density	89.7	pcf
Vol. of Voids	149.53	cm^3
Vol. of Solids	163.93	cm^3
Void Ratio	0.91	
Saturation	102.5	%

Moisture Content

Mass of wet sample & tare	694.10	g
Mass of dry sample & tare	540.90	g
Mass of tare	90.10	g
% Moisture	34.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	18	15	-	1.64	115.36	15.01	21.5	-	-	-	
11/23/10	18	20	300	1.65	116.06	15.10	21.5	9.12E-08	0.965	8.80E-08	
11/23/10	18	25	300	1.66	116.76	15.19	21.5	9.07E-08	0.965	8.75E-08	
11/23/10	18	30	300	1.66	116.76	15.19	21.5	9.04E-08	0.965	8.72E-08	*
11/23/10	18	35	300	1.66	116.76	15.19	21.5	9.04E-08	0.965	8.72E-08	*
11/23/10	18	40	300	1.66	116.76	15.19	21.5	9.04E-08	0.965	8.72E-08	*
11/23/10	18	45	300	1.66	116.76	15.19	21.5	9.04E-08	0.965	8.72E-08	*

Reported Average Hydraulic Conductivity* 8.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	262
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	245			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/23/10
Checked By	CS

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10612/ST-31	Depth/Elev.	-
Location	-	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	3.040	in	7.72	cm
Diameter	2.839	in	7.21	cm
Area	6.33	in^2	40.84	cm^2
Volume	315.35	cm^3	0.0111	ft^3
Mass	595.20	g	1.31	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.3	pcf		

Moisture Content

Mass of wet sample & tare	595.20	g
Mass of dry sample & tare	441.00	g
Mass of tare	0.00	g
% Moisture	35.0	

Test Data

Speed	12	
Board Number	8	
Cell Number	11	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	174.44	cm
Min Head	172.33	cm
Maximum Gradient	22.67	
Minimum Gradient	22.39	

Final Data (After Test)

Average Height of Sample			3.030	in	7.70	cm
Average Diameter of Sample			2.839	in	7.21	cm
Area	6.33	in^2	40.84	cm^2		
Volume	314.31	cm^3	0.0111	ft^3		
Mass	596.10	g	1.31	lb		

Dry Density	87.6	pcf
Vol. of Voids	153.95	cm^3
Vol. of Solids	160.36	cm^3
Void Ratio	0.96	
Saturation	100.7	%

Moisture Content

Mass of wet sample & tare	693.10	g
Mass of dry sample & tare	538.00	g
Mass of tare	97.00	g
% Moisture	35.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/23/10	18	15	-	2.45	172.33	22.39	21.5	-	-	-	
11/23/10	18	20	300	2.47	173.74	22.57	21.5	6.10E-08	0.965	5.88E-08	
11/23/10	18	25	300	2.46	173.04	22.48	21.5	6.09E-08	0.965	5.87E-08	
11/23/10	18	30	300	2.48	174.44	22.67	21.5	6.07E-08	0.965	5.86E-08	*
11/23/10	18	35	300	2.47	173.74	22.57	21.5	6.06E-08	0.965	5.85E-08	*
11/23/10	18	40	300	2.48	174.44	22.67	21.5	6.06E-08	0.965	5.85E-08	*
11/23/10	18	45	300	2.46	173.04	22.48	21.5	6.07E-08	0.965	5.86E-08	*

Reported Average Hydraulic Conductivity* 5.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/24/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 21	S. Type	UD
Sample ID	10613/ST-32	Depth/Elev.	-
Location	-	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	3.038	in	7.72	cm
Diameter	2.853	in	7.25	cm
Area	6.39	in^2	41.24	cm^2
Volume	318.26	cm^3	0.0112	ft^3
Mass	601.30	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.7	pcf		

Moisture Content

Mass of wet sample & tare	601.30	g
Mass of dry sample & tare	447.20	g
Mass of tare	0.00	g
% Moisture	34.5	

Test Data

Speed	12	
Board Number	3	
Cell Number	10	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	203.28	cm
Min Head	202.58	cm
Maximum Gradient	26.44	
Minimum Gradient	26.35	

Final Data (After Test)

Average Height of Sample			3.027	in	7.69	cm
Average Diameter of Sample			2.844	in	7.22	cm
Area	6.35	in^2	40.98	cm^2		
Volume	315.11	cm^3	0.0111	ft^3		
Mass	603.90	g	1.33	lb		

Dry Density	88.6	pcf
Vol. of Voids	152.41	cm^3
Vol. of Solids	162.70	cm^3
Void Ratio	0.94	
Saturation	102.7	%

Moisture Content

Mass of wet sample & tare	692.80	g
Mass of dry sample & tare	536.40	g
Mass of tare	89.20	g
% Moisture	35.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	8	0	-	2.89	203.28	26.44	19.8	-	-	-	
11/24/10	8	5	300	2.88	202.58	26.35	19.8	5.18E-08	1.005	5.20E-08	
11/24/10	8	10	300	2.89	203.28	26.44	19.8	5.18E-08	1.005	5.20E-08	
11/24/10	8	15	300	2.89	203.28	26.44	19.8	5.17E-08	1.005	5.19E-08	*
11/24/10	8	20	300	2.89	203.28	26.44	19.8	5.17E-08	1.005	5.19E-08	*
11/24/10	8	25	300	2.88	202.58	26.35	19.8	5.18E-08	1.005	5.20E-08	*
11/24/10	8	30	300	2.89	203.28	26.44	19.8	5.18E-08	1.005	5.20E-08	*

Reported Average Hydraulic Conductivity* 5.2E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAP AASHTO R18

Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10614/ST-33	Depth/Elev.	-
Location	-	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	3.041	in	7.72	cm
Diameter	2.863	in	7.27	cm
Area	6.44	in^2	41.53	cm^2
Volume	320.81	cm^3	0.0113	ft^3
Mass	613.30	g	1.35	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	89.7	pcf		

Moisture Content

Mass of wet sample & tare	613.30	g
Mass of dry sample & tare	461.20	g
Mass of tare	0.00	g
% Moisture	33.0	

Test Data

Speed	12	
Board Number	4	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	170.93	cm
Min Head	170.22	cm
Maximum Gradient	22.19	
Minimum Gradient	22.10	

Final Data (After Test)

Average Height of Sample			3.032	in	7.70 cm
Average Diameter of Sample			2.844	in	7.22 cm
Area	6.35	in^2	40.98	cm^2	
Volume	315.63	cm^3	0.0111	ft^3	
Mass	616.00	g	1.36	lb	

Dry Density	91.2	pcf
Vol. of Voids	147.81	cm^3
Vol. of Solids	167.82	cm^3
Void Ratio	0.88	
Saturation	104.5	%

Moisture Content

Mass of wet sample & tare	686.00	g
Mass of dry sample & tare	531.60	g
Mass of tare	70.40	g
% Moisture	33.5	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	8	0	-	2.43	170.93	22.19	19.8	-	-	-	
11/24/10	8	5	300	2.42	170.22	22.10	19.8	6.17E-08	1.005	6.20E-08	
11/24/10	8	10	300	2.42	170.22	22.10	19.8	6.18E-08	1.005	6.21E-08	
11/24/10	8	15	300	2.43	170.93	22.19	19.8	6.17E-08	1.005	6.20E-08	*
11/24/10	8	20	300	2.42	170.22	22.10	19.8	6.17E-08	1.005	6.20E-08	*
11/24/10	8	25	300	2.42	170.22	22.10	19.8	6.18E-08	1.005	6.21E-08	*
11/24/10	8	30	300	2.43	170.93	22.19	19.8	6.17E-08	1.005	6.20E-08	*

Reported Average Hydraulic Conductivity* 6.2E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/24/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10615/ST-34	Depth/Elev.	-
Location	-	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	3.043	in	7.73	cm
Diameter	2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2
Volume	317.89	cm^3	0.0112	ft^3
Mass	622.20	g	1.37	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	94.3	pcf		

Moisture Content

Mass of wet sample & tare	622.20	g
Mass of dry sample & tare	480.30	g
Mass of tare	0.00	g
% Moisture	29.5	

Test Data

Speed	12	
Board Number	5	
Cell Number	5	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	205.39	cm
Min Head	203.99	cm
Maximum Gradient	26.67	
Minimum Gradient	26.49	

Final Data (After Test)

Average Height of Sample			3.032	in	7.70	cm
Average Diameter of Sample			2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2		
Volume	318.30	cm^3	0.0112	ft^3		
Mass	625.80	g	1.38	lb		

Dry Density	94.2	pcf
Vol. of Voids	143.56	cm^3
Vol. of Solids	174.74	cm^3
Void Ratio	0.82	
Saturation	101.2	%

Moisture Content

Mass of wet sample & tare	703.50	g
Mass of dry sample & tare	558.30	g
Mass of tare	78.00	g
% Moisture	30.2	

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	
11/24/10	10	45	-	2.92	205.39	26.67	20.2	-	-	-	
11/24/10	10	50	300	2.91	204.69	26.58	20.2	5.09E-08	0.995	5.07E-08	
11/24/10	10	55	300	2.90	203.99	26.49	20.2	5.11E-08	0.995	5.08E-08	
11/24/10	11	0	300	2.92	205.39	26.67	20.2	5.10E-08	0.995	5.07E-08	*
11/24/10	11	5	300	2.92	205.39	26.67	20.2	5.08E-08	0.995	5.06E-08	*
11/24/10	11	10	300	2.91	204.69	26.58	20.2	5.09E-08	0.995	5.07E-08	*
11/24/10	11	15	300	2.92	205.39	26.67	20.2	5.09E-08	0.995	5.07E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10616/ST-35	Depth/Elev.	-
Location	-	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	3.047	in	7.74	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	318.53	cm^3	0.0112	ft^3
Mass	571.70	g	1.26	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.7	pcf		

Moisture Content

Mass of wet sample & tare	571.70	g
Mass of dry sample & tare	422.40	g
Mass of tare	0.00	g
% Moisture	35.3	

Test Data

Speed	12	
Board Number	6	
Cell Number	17	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	109.03	cm
Min Head	108.32	cm
Maximum Gradient	13.97	
Minimum Gradient	13.88	

Final Data (After Test)

Average Height of Sample			3.072	in	7.80 cm
Average Diameter of Sample			2.850	in	7.24 cm
Area	6.38	in^2	41.16	cm^2	
Volume	321.15	cm^3	0.0113	ft^3	
Mass	592.30	g	1.31	lb	

Dry Density	82.1	pcf
Vol. of Voids	167.47	cm^3
Vol. of Solids	153.68	cm^3
Void Ratio	1.09	
Saturation	101.3	%

Moisture Content

Mass of wet sample & tare	667.80	g
Mass of dry sample & tare	498.20	g
Mass of tare	75.80	g
% Moisture	40.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	10	45	-	1.55	109.03	13.97	20.2	-	-	-	
11/24/10	10	50	300	1.54	108.32	13.88	20.2	9.77E-08	0.995	9.72E-08	
11/24/10	10	55	300	1.55	109.03	13.97	20.2	9.77E-08	0.995	9.72E-08	
11/24/10	11	0	300	1.54	108.32	13.88	20.2	9.77E-08	0.995	9.72E-08	*
11/24/10	11	5	300	1.54	108.32	13.88	20.2	9.80E-08	0.995	9.76E-08	*
11/24/10	11	10	300	1.54	108.32	13.88	20.2	9.80E-08	0.995	9.76E-08	*
11/24/10	11	15	300	1.55	109.03	13.97	20.2	9.77E-08	0.995	9.72E-08	*

Reported Average Hydraulic Conductivity* 9.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/24/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10617/ST-36	Depth/Elev.	-
Location	-	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	3.049	in	7.74	cm
Diameter	2.848	in	7.23	cm
Area	6.37	in^2	41.10	cm^2
Volume	318.29	cm^3	0.0112	ft^3
Mass	588.60	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	83.7	pcf		

Moisture Content

Mass of wet sample & tare	588.60	g
Mass of dry sample & tare	426.80	g
Mass of tare	0.00	g
% Moisture	37.9	

Test Data

Speed	12	
Board Number	11	
Cell Number	4	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	172.33	cm
Min Head	171.63	cm
Maximum Gradient	22.37	
Minimum Gradient	22.28	

Final Data (After Test)

Average Height of Sample			3.033	in	7.70	cm
Average Diameter of Sample			2.844	in	7.22	cm
Area	6.35	in^2	40.98	cm^2		
Volume	315.73	cm^3	0.0112	ft^3		
Mass	591.50	g	1.30	lb		

Dry Density	84.4	pcf
Vol. of Voids	160.51	cm^3
Vol. of Solids	155.23	cm^3
Void Ratio	1.03	
Saturation	102.6	%

Moisture Content

Mass of wet sample & tare	680.70	g
Mass of dry sample & tare	516.10	g
Mass of tare	89.30	g
% Moisture	38.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	10	50	-	2.45	172.33	22.37	20.4	-	-	-	
11/24/10	10	55	300	2.45	172.33	22.37	20.4	6.11E-08	0.991	6.05E-08	
11/24/10	11	0	300	2.45	172.33	22.37	20.4	6.11E-08	0.991	6.05E-08	
11/24/10	11	5	300	2.45	172.33	22.37	20.4	6.11E-08	0.991	6.05E-08	*
11/24/10	11	10	300	2.44	171.63	22.28	20.4	6.12E-08	0.991	6.06E-08	*
11/24/10	11	15	300	2.44	171.63	22.28	20.4	6.13E-08	0.991	6.08E-08	*
11/24/10	11	20	300	2.45	172.33	22.37	20.4	6.12E-08	0.991	6.06E-08	*

Reported Average Hydraulic Conductivity* 6.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	140			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 21	S. Type	UD
Sample ID	10618/ST-37	Depth/Elev.	-
Location	-	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	3.037	in	7.71	cm
Diameter	2.858	in	7.26	cm
Area	6.42	in^2	41.39	cm^2
Volume	319.27	cm^3	0.0113	ft^3
Mass	589.20	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.3	pcf		

Moisture Content

Mass of wet sample & tare	589.20	g
Mass of dry sample & tare	421.00	g
Mass of tare	0.00	g
% Moisture	40.0	

Test Data

Speed	12	
Board Number	12	
Cell Number	8	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	163.19	cm
Min Head	161.78	cm
Maximum Gradient	21.31	
Minimum Gradient	21.13	

Final Data (After Test)

Average Height of Sample			3.015	in	7.66 cm
Average Diameter of Sample			2.864	in	7.27 cm
Area	6.44	in^2	41.56	cm^2	
Volume	318.29	cm^3	0.0112	ft^3	
Mass	591.60	g	1.30	lb	

Dry Density	82.6	pcf
Vol. of Voids	165.10	cm^3
Vol. of Solids	153.19	cm^3
Void Ratio	1.08	
Saturation	103.2	%

Moisture Content

Mass of wet sample & tare	687.70	g
Mass of dry sample & tare	517.50	g
Mass of tare	96.50	g
% Moisture	40.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	10	50	-	2.32	163.19	21.31	20.4	-	-	-	
11/24/10	10	55	300	2.31	162.49	21.22	20.4	6.34E-08	0.991	6.28E-08	
11/24/10	11	0	300	2.30	161.78	21.13	20.4	6.36E-08	0.991	6.30E-08	
11/24/10	11	5	300	2.32	163.19	21.31	20.4	6.35E-08	0.991	6.29E-08	*
11/24/10	11	10	300	2.31	162.49	21.22	20.4	6.34E-08	0.991	6.28E-08	*
11/24/10	11	15	300	2.32	163.19	21.31	20.4	6.34E-08	0.991	6.28E-08	*
11/24/10	11	20	300	2.32	163.19	21.31	20.4	6.32E-08	0.991	6.26E-08	*

Reported Average Hydraulic Conductivity* 6.3E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10619/ST-38	Depth/Elev.	-
Location	-	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	3.056	in	7.76	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	319.47	cm^3	0.0113	ft^3
Mass	601.80	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.2	pcf		

Moisture Content

Mass of wet sample & tare	601.80	g
Mass of dry sample & tare	441.10	g
Mass of tare	0.00	g
% Moisture	36.4	

Test Data

Speed	12	
Board Number	1	
Cell Number	6	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	192.03	cm
Min Head	191.32	cm
Maximum Gradient	24.90	
Minimum Gradient	24.81	

Final Data (After Test)

Average Height of Sample			3.036	in	7.71	cm
Average Diameter of Sample			2.840	in	7.21	cm
Area	6.33	in^2	40.87	cm^2		
Volume	315.16	cm^3	0.0111	ft^3		
Mass	603.40	g	1.33	lb		

Dry Density	87.2	pcf
Vol. of Voids	154.92	cm^3
Vol. of Solids	160.24	cm^3
Void Ratio	0.97	
Saturation	105.0	%

Moisture Content

Mass of wet sample & tare	676.90	g
Mass of dry sample & tare	514.00	g
Mass of tare	72.90	g
% Moisture	36.9	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	9	30	-	2.73	192.03	24.90	29.0	-	-	-	
11/24/10	9	35	300	2.72	191.32	24.81	29.0	5.51E-08	0.814	4.48E-08	
11/24/10	9	40	300	2.73	192.03	24.90	29.0	5.51E-08	0.814	4.48E-08	
11/24/10	9	45	300	2.73	192.03	24.90	29.0	5.50E-08	0.814	4.48E-08	*
11/24/10	9	50	300	2.73	192.03	24.90	29.0	5.50E-08	0.814	4.48E-08	*
11/24/10	9	55	300	2.72	191.32	24.81	29.0	5.51E-08	0.814	4.48E-08	*
11/24/10	10	0	300	2.72	191.32	24.81	29.0	5.52E-08	0.814	4.49E-08	*

Reported Average Hydraulic Conductivity* 4.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAR AASHTO R18

Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10620/ST-39	Depth/Elev.	-
Location	-	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	3.044	in	7.73	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	318.22	cm^3	0.0112	ft^3
Mass	611.90	g	1.35	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	90.7	pcf		

Moisture Content

Mass of wet sample & tare	611.90	g
Mass of dry sample & tare	462.40	g
Mass of tare	0.00	g
% Moisture	32.3	

Test Data

Speed	12	
Board Number	2	
Cell Number	18	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	163.19	cm
Min Head	161.78	cm
Maximum Gradient	21.02	
Minimum Gradient	20.84	

Final Data (After Test)

Average Height of Sample			3.056	in	7.76 cm
Average Diameter of Sample			2.856	in	7.25 cm
Area	6.41	in^2	41.33	cm^2	
Volume	320.82	cm^3	0.0113	ft^3	
Mass	616.90	g	1.36	lb	

Dry Density	90.1	pcf
Vol. of Voids	152.46	cm^3
Vol. of Solids	168.36	cm^3
Void Ratio	0.91	
Saturation	100.9	%

Moisture Content

Mass of wet sample & tare	689.90	g
Mass of dry sample & tare	536.20	g
Mass of tare	73.80	g
% Moisture	33.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	9	30	-	2.32	163.19	21.02	20.0	-	-	-	
11/24/10	9	35	300	2.32	163.19	21.02	20.0	6.44E-08	1.000	6.45E-08	
11/24/10	9	40	300	2.31	162.49	20.93	20.0	6.46E-08	1.000	6.46E-08	
11/24/10	9	45	300	2.30	161.78	20.84	20.0	6.49E-08	1.000	6.49E-08	*
11/24/10	9	50	300	2.32	163.19	21.02	20.0	6.47E-08	1.000	6.47E-08	*
11/24/10	9	55	300	2.30	161.78	20.84	20.0	6.47E-08	1.000	6.47E-08	*
11/24/10	10	0	300	2.30	161.78	20.84	20.0	6.50E-08	1.000	6.50E-08	*

Reported Average Hydraulic Conductivity* 6.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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AAP AASHTO R18

Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 21	S. Type	UD
Sample ID	10621/ST-40	Depth/Elev.	-
Location	-	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	3.041	in	7.72	cm
Diameter	2.876	in	7.31	cm
Area	6.50	in^2	41.91	cm^2
Volume	323.73	cm^3	0.0114	ft^3
Mass	607.40	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.4	pcf		

Moisture Content

Mass of wet sample & tare	607.40	g
Mass of dry sample & tare	448.00	g
Mass of tare	0.00	g
% Moisture	35.6	

Test Data

Speed	12	
Board Number	7	
Cell Number	12	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	138.57	cm
Min Head	137.16	cm
Maximum Gradient	18.02	
Minimum Gradient	17.83	

Final Data (After Test)

Average Height of Sample			3.028	in	7.69	cm
Average Diameter of Sample			2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2		
Volume	319.66	cm^3	0.0113	ft^3		
Mass	609.30	g	1.34	lb		

Dry Density	87.5	pcf
Vol. of Voids	156.70	cm^3
Vol. of Solids	162.96	cm^3
Void Ratio	0.96	
Saturation	102.8	%

Moisture Content

Mass of wet sample & tare	677.80	g
Mass of dry sample & tare	516.70	g
Mass of tare	68.70	g
% Moisture	36.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	8	20	-	1.96	137.87	17.93	20.0	-	-	-	
11/24/10	8	25	300	1.96	137.87	17.93	20.0	7.52E-08	1.000	7.52E-08	
11/24/10	8	30	300	1.95	137.16	17.83	20.0	7.54E-08	1.000	7.54E-08	
11/24/10	8	35	300	1.95	137.16	17.83	20.0	7.56E-08	1.000	7.56E-08	*
11/24/10	8	40	300	1.96	137.87	17.93	20.0	7.54E-08	1.000	7.54E-08	*
11/24/10	8	45	300	1.97	138.57	18.02	20.0	7.50E-08	1.000	7.50E-08	*
11/24/10	8	50	300	1.96	137.87	17.93	20.0	7.50E-08	1.000	7.50E-08	*

Reported Average Hydraulic Conductivity* 7.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	262
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	245			Pore Pressure Transducer ID #	28

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AAP AASHTO R18

Tested By	VG
Date	11/24/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10622/ST-41	Depth/Elev.	-
Location	-	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	2.327	in	5.91	cm
Diameter	2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2
Volume	244.29	cm^3	0.0086	ft^3
Mass	459.70	g	1.01	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	85.0	pcf		

Moisture Content

Mass of wet sample & tare	459.70	g
Mass of dry sample & tare	332.80	g
Mass of tare	0.00	g
% Moisture	38.1	

Test Data

Speed	12	
Board Number	8	
Cell Number	11	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	206.10	cm
Min Head	204.69	cm
Maximum Gradient	34.84	
Minimum Gradient	34.60	

Final Data (After Test)

Average Height of Sample			2.329	in	5.92 cm
Average Diameter of Sample			2.848	in	7.23 cm
Area	6.37	in^2	41.10	cm^2	
Volume	243.13	cm^3	0.0086	ft^3	
Mass	460.90	g	1.02	lb	

Dry Density	85.5	pcf
Vol. of Voids	122.06	cm^3
Vol. of Solids	121.07	cm^3
Void Ratio	1.01	
Saturation	104.8	%

Moisture Content

Mass of wet sample & tare	568.90	g
Mass of dry sample & tare	441.00	g
Mass of tare	108.20	g
% Moisture	38.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	8	20	-	2.92	205.39	34.72	20.0	-	-	-	
11/24/10	8	25	300	2.93	206.10	34.84	20.0	3.92E-08	1.000	3.92E-08	
11/24/10	8	30	300	2.92	205.39	34.72	20.0	3.92E-08	1.000	3.92E-08	
11/24/10	8	35	300	2.92	205.39	34.72	20.0	3.92E-08	1.000	3.93E-08	*
11/24/10	8	40	300	2.92	205.39	34.72	20.0	3.92E-08	1.000	3.93E-08	*
11/24/10	8	45	300	2.91	204.69	34.60	20.0	3.93E-08	1.000	3.93E-08	*
11/24/10	8	50	300	2.93	206.10	34.84	20.0	3.92E-08	1.000	3.93E-08	*

Reported Average Hydraulic Conductivity* 3.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG/KI
Date	11/25/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10645/ST-42	Depth/Elev.	-
Location	-	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	2.573	in	6.54	cm
Diameter	2.842	in	7.22	cm
Area	6.34	in^2	40.93	cm^2
Volume	267.47	cm^3	0.0094	ft^3
Mass	494.20	g	1.09	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.8	pcf		

Moisture Content

Mass of wet sample & tare	494.20	g
Mass of dry sample & tare	354.80	g
Mass of tare	0.00	g
% Moisture	39.3	

Test Data

Speed	12	
Board Number	11	
Cell Number	4	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	180.07	cm
Min Head	178.66	cm
Maximum Gradient	27.57	
Minimum Gradient	27.36	

Final Data (After Test)

Average Height of Sample			2.571	in	6.53	cm
Average Diameter of Sample			2.859	in	7.26	cm
Area	6.42	in^2	41.42	cm^2		
Volume	270.47	cm^3	0.0096	ft^3		
Mass	498.90	g	1.10	lb		

Dry Density	81.9	pcf
Vol. of Voids	141.43	cm^3
Vol. of Solids	129.04	cm^3
Void Ratio	1.10	
Saturation	101.8	%

Moisture Content

Mass of wet sample & tare	565.80	g
Mass of dry sample & tare	421.80	g
Mass of tare	67.00	g
% Moisture	40.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/25/10	10	10	-	2.55	179.37	27.47	20.2	-	-	-	
11/25/10	10	20	600	2.56	180.07	27.57	20.2	4.91E-08	0.995	4.89E-08	
11/25/10	10	30	600	2.54	178.66	27.36	20.2	4.92E-08	0.995	4.90E-08	
11/25/10	10	40	600	2.56	180.07	27.57	20.2	4.92E-08	0.995	4.90E-08	*
11/25/10	10	50	600	2.54	178.66	27.36	20.2	4.92E-08	0.995	4.90E-08	*
11/25/10	11	0	600	2.55	179.37	27.47	20.2	4.93E-08	0.995	4.91E-08	*
11/25/10	11	10	600	2.55	179.37	27.47	20.2	4.92E-08	0.995	4.90E-08	*

Reported Average Hydraulic Conductivity* 4.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10625/ST-43	Depth/Elev.	-
Location	-	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	2.950	in	7.49	cm
Diameter	2.847	in	7.23	cm
Area	6.37	in^2	41.07	cm^2
Volume	307.74	cm^3	0.0109	ft^3
Mass	580.70	g	1.28	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.9	pcf		

Moisture Content

Mass of wet sample & tare	580.70	g
Mass of dry sample & tare	428.50	g
Mass of tare	0.00	g
% Moisture	35.5	

Test Data

Speed	12	
Board Number	8	
Cell Number	12	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	165.30	cm
Min Head	164.60	cm
Maximum Gradient	22.01	
Minimum Gradient	21.91	

Final Data (After Test)

Average Height of Sample		2.957	in	7.51	cm
Average Diameter of Sample		2.841	in	7.22	cm
Area	6.34 in^2	40.90	cm^2		
Volume	307.17 cm^3	0.0108	ft^3		
Mass	586.10 g	1.29	lb		

Dry Density	87.1	pcf
Vol. of Voids	151.28	cm^3
Vol. of Solids	155.90	cm^3
Void Ratio	0.97	
Saturation	104.0	%

Moisture Content

Mass of wet sample & tare	687.60	g
Mass of dry sample & tare	530.30	g
Mass of tare	101.80	g
% Moisture	36.7	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	14	50	-	2.34	164.60	21.91	21.5	-	-	-	
11/24/10	14	55	300	2.34	164.60	21.91	21.5	6.25E-08	0.965	6.03E-08	
11/24/10	15	0	300	2.35	165.30	22.01	21.5	6.23E-08	0.965	6.01E-08	
11/24/10	15	5	300	2.35	165.30	22.01	21.5	6.22E-08	0.965	6.00E-08	*
11/24/10	15	10	300	2.34	164.60	21.91	21.5	6.23E-08	0.965	6.01E-08	*
11/24/10	15	15	300	2.35	165.30	22.01	21.5	6.23E-08	0.965	6.01E-08	*
11/24/10	15	20	300	2.34	164.60	21.91	21.5	6.23E-08	0.965	6.01E-08	*

Reported Average Hydraulic Conductivity* 6.0E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10626/ST-44	Depth/Elev.	-
Location	-	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	2.760	in	7.01	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	288.53	cm^3	0.0102	ft^3
Mass	521.70	g	1.15	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.3	pcf		

Moisture Content

Mass of wet sample & tare	521.70	g
Mass of dry sample & tare	380.60	g
Mass of tare	0.00	g
% Moisture	37.1	

Test Data

Speed	12	
Board Number	5	
Cell Number	17	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	141.38	cm
Min Head	140.68	cm
Maximum Gradient	20.09	
Minimum Gradient	19.99	

Final Data (After Test)

Average Height of Sample			2.771	in	7.04	cm
Average Diameter of Sample			2.853	in	7.25	cm
Area	6.39	in^2	41.24	cm^2		
Volume	290.29	cm^3	0.0103	ft^3		
Mass	528.20	g	1.16	lb		

Dry Density	81.8	pcf
Vol. of Voids	151.86	cm^3
Vol. of Solids	138.43	cm^3
Void Ratio	1.10	
Saturation	97.1	%

Moisture Content

Mass of wet sample & tare	626.60	g
Mass of dry sample & tare	479.10	g
Mass of tare	98.50	g
% Moisture	38.8	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	16	30	-	2.01	141.38	20.09	22.0	-	-	-	
11/24/10	16	35	300	2.01	141.38	20.09	22.0	6.76E-08	0.953	6.44E-08	
11/24/10	16	40	300	2.00	140.68	19.99	22.0	6.78E-08	0.953	6.46E-08	
11/24/10	16	45	300	2.01	141.38	20.09	22.0	6.78E-08	0.953	6.46E-08	*
11/24/10	16	50	300	2.01	141.38	20.09	22.0	6.76E-08	0.953	6.44E-08	*
11/24/10	16	55	300	2.00	140.68	19.99	22.0	6.78E-08	0.953	6.46E-08	*
11/24/10	17	0	300	2.01	141.38	20.09	22.0	6.78E-08	0.953	6.46E-08	*

Reported Average Hydraulic Conductivity* 6.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10627/ST-45	Depth/Elev.	-
Location	-	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	2.478	in	6.29	cm
Diameter	2.848	in	7.23	cm
Area	6.37	in^2	41.10	cm^2
Volume	258.69	cm^3	0.0091	ft^3
Mass	476.60	g	1.05	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.1	pcf		

Moisture Content

Mass of wet sample & tare	476.60	g
Mass of dry sample & tare	357.00	g
Mass of tare	0.00	g
% Moisture	33.5	

Test Data

Speed	12	
Board Number	6	
Cell Number	5	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	171.63	cm
Min Head	168.82	cm
Maximum Gradient	27.29	
Minimum Gradient	26.84	

Final Data (After Test)

Average Height of Sample			2.476	in	6.29 cm
Average Diameter of Sample			2.861	in	7.27 cm
Area	6.43	in^2	41.48	cm^2	
Volume	260.84	cm^3	0.0092	ft^3	
Mass	487.80	g	1.08	lb	

Dry Density	85.5	pcf
Vol. of Voids	130.94	cm^3
Vol. of Solids	129.90	cm^3
Void Ratio	1.01	
Saturation	99.7	%

Moisture Content

Mass of wet sample & tare	580.10	g
Mass of dry sample & tare	449.60	g
Mass of tare	92.60	g
% Moisture	36.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	16	30	-	2.44	171.63	27.29	22.0	-	-	-	
11/24/10	16	35	300	2.44	171.63	27.29	22.0	4.95E-08	0.953	4.72E-08	
11/24/10	16	40	300	2.44	171.63	27.29	22.0	4.95E-08	0.953	4.72E-08	
11/24/10	16	45	300	2.44	171.63	27.29	22.0	4.95E-08	0.953	4.72E-08	*
11/24/10	16	50	300	2.41	169.52	26.95	22.0	4.98E-08	0.953	4.75E-08	*
11/24/10	16	55	300	2.42	170.22	27.07	22.0	5.00E-08	0.953	4.77E-08	*
11/24/10	17	0	300	2.40	168.82	26.84	22.0	5.01E-08	0.953	4.78E-08	*

Reported Average Hydraulic Conductivity* 4.8E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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AASHTO R18

Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10628/ST-46	Depth/Elev.	-
Location	-	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	2.419	in	6.14	cm
Diameter	2.839	in	7.21	cm
Area	6.33	in^2	40.84	cm^2
Volume	250.93	cm^3	0.0089	ft^3
Mass	453.30	g	1.00	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	81.4	pcf		

Moisture Content

Mass of wet sample & tare	453.30	g
Mass of dry sample & tare	327.40	g
Mass of tare	0.00	g
% Moisture	38.5	

Test Data

Speed	12	
Board Number	1	
Cell Number	6	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	114.65	cm
Min Head	113.95	cm
Maximum Gradient	18.68	
Minimum Gradient	18.57	

Final Data (After Test)

Average Height of Sample		2.416	in	6.14	cm	
Average Diameter of Sample		2.851	in	7.24	cm	
Area	6.38	in^2	41.19	cm^2		
Volume	252.74	cm^3	0.0089	ft^3	Dry Density	80.9 pcf
Mass	463.40	g	1.02	lb	Vol. of Voids	133.59 cm^3
					Vol. of Solids	119.16 cm^3
					Void Ratio	1.12
					Saturation	101.6 %

Moisture Content

Mass of wet sample & tare	564.60	g
Mass of dry sample & tare	429.00	g
Mass of tare	101.60	g
% Moisture	41.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	15	15	-	1.62	113.95	18.57	21.4	-	-	-	
11/24/10	15	20	300	1.62	113.95	18.57	21.4	7.32E-08	0.967	7.08E-08	
11/24/10	15	25	300	1.63	114.65	18.68	21.4	7.30E-08	0.967	7.06E-08	
11/24/10	15	30	300	1.62	113.95	18.57	21.4	7.30E-08	0.967	7.06E-08	*
11/24/10	15	35	300	1.62	113.95	18.57	21.4	7.32E-08	0.967	7.08E-08	*
11/24/10	15	40	300	1.63	114.65	18.68	21.4	7.30E-08	0.967	7.06E-08	*
11/24/10	15	45	300	1.63	114.65	18.68	21.4	7.28E-08	0.967	7.04E-08	*

Reported Average Hydraulic Conductivity* 7.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10629/ST-47	Depth/Elev.	-
Location	-	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	2.449	in	6.22	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	256.02	cm^3	0.0090	ft^3
Mass	470.60	g	1.04	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.1	pcf		

Moisture Content

Mass of wet sample & tare	470.60	g
Mass of dry sample & tare	337.00	g
Mass of tare	0.00	g
% Moisture	39.6	

Test Data

Speed	12	
Board Number	2	
Cell Number	18	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.98	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	158.97	cm
Min Head	156.86	cm
Maximum Gradient	25.64	
Minimum Gradient	25.30	

Final Data (After Test)

Average Height of Sample		2.441	in	6.20	cm
Average Diameter of Sample		2.846	in	7.23	cm
Area	6.36	in^2	41.04	cm^2	
Volume	254.47	cm^3	0.0090	ft^3	
Mass	473.50	g	1.04	lb	

Dry Density	82.7	pcf
Vol. of Voids	131.84	cm^3
Vol. of Solids	122.62	cm^3
Void Ratio	1.08	
Saturation	103.4	%

Moisture Content

Mass of wet sample & tare	558.50	g
Mass of dry sample & tare	422.30	g
Mass of tare	85.30	g
% Moisture	40.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	15	15	-	2.23	156.86	25.30	21.4	-	-	-	
11/24/10	15	20	300	2.24	157.56	25.41	21.4	5.38E-08	0.967	5.20E-08	
11/24/10	15	25	300	2.26	158.97	25.64	21.4	5.35E-08	0.967	5.17E-08	
11/24/10	15	30	300	2.26	158.97	25.64	21.4	5.32E-08	0.967	5.15E-08	*
11/24/10	15	35	300	2.26	158.97	25.64	21.4	5.32E-08	0.967	5.15E-08	*
11/24/10	15	40	300	2.25	158.27	25.53	21.4	5.33E-08	0.967	5.16E-08	*
11/24/10	15	45	300	2.25	158.27	25.53	21.4	5.35E-08	0.967	5.17E-08	*

Reported Average Hydraulic Conductivity* 5.2E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10630/ST-48	Depth/Elev.	-
Location	-	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	2.810	in	7.14	cm
Diameter	2.858	in	7.26	cm
Area	6.42	in^2	41.39	cm^2
Volume	295.41	cm^3	0.0104	ft^3
Mass	554.70	g	1.22	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.1	pcf		

Moisture Content

Mass of wet sample & tare	554.70	g
Mass of dry sample & tare	407.40	g
Mass of tare	0.00	g
% Moisture	36.2	

Test Data

Speed	12	
Board Number	3	
Cell Number	9	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	139.27	cm
Min Head	137.16	cm
Maximum Gradient	19.40	
Minimum Gradient	19.10	

Final Data (After Test)

Average Height of Sample			2.827	in	7.18	cm
Average Diameter of Sample			2.866	in	7.28	cm
Area	6.45	in^2	41.62	cm^2		
Volume	298.86	cm^3	0.0106	ft^3		
Mass	564.20	g	1.24	lb		

Dry Density	85.1	pcf
Vol. of Voids	150.58	cm^3
Vol. of Solids	148.28	cm^3
Void Ratio	1.02	
Saturation	103.9	%

Moisture Content

Mass of wet sample & tare	665.10	g
Mass of dry sample & tare	508.80	g
Mass of tare	101.40	g
% Moisture	38.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	18	0	-	1.96	137.87	19.20	22.2	-	-	-	
11/24/10	18	5	300	1.97	138.57	19.30	22.2	6.99E-08	0.949	6.63E-08	
11/24/10	18	10	300	1.95	137.16	19.10	22.2	7.01E-08	0.949	6.65E-08	
11/24/10	18	15	300	1.98	139.27	19.40	22.2	6.99E-08	0.949	6.63E-08	*
11/24/10	18	20	300	1.96	137.87	19.20	22.2	6.97E-08	0.949	6.62E-08	*
11/24/10	18	25	300	1.97	138.57	19.30	22.2	6.99E-08	0.949	6.63E-08	*
11/24/10	18	30	300	1.97	138.57	19.30	22.2	6.97E-08	0.949	6.62E-08	*

Reported Average Hydraulic Conductivity* 6.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/24/10
Checked By	UB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10631/ST-49	Depth/Elev.	-
Location	-	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	2.603	in	6.61	cm
Diameter	2.861	in	7.27	cm
Area	6.43	in^2	41.48	cm^2
Volume	274.22	cm^3	0.0097	ft^3
Mass	493.20	g	1.09	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	81.3	pcf		

Moisture Content

Mass of wet sample & tare	493.20	g
Mass of dry sample & tare	357.10	g
Mass of tare	0.00	g
% Moisture	38.1	

Test Data

Speed	12	
Board Number	4	
Cell Number	10	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	118.87	cm
Min Head	115.36	cm
Maximum Gradient	17.89	
Minimum Gradient	17.36	

Final Data (After Test)

Average Height of Sample		2.616	in	6.64 cm
Average Diameter of Sample		2.854	in	7.25 cm
Area	6.40 in^2	41.27	cm^2	
Volume	274.24 cm^3	0.0097	ft^3	
Mass	503.20 g	1.11	lb	

Dry Density	81.2	pcf
Vol. of Voids	144.47	cm^3
Vol. of Solids	129.78	cm^3
Void Ratio	1.11	
Saturation	101.3	%

Moisture Content

Mass of wet sample & tare	596.40	g
Mass of dry sample & tare	450.00	g
Mass of tare	92.90	g
% Moisture	41.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	18	0	-	1.67	117.47	17.68	22.2	-	-	-	
11/24/10	18	5	300	1.67	117.47	17.68	22.2	7.67E-08	0.949	7.28E-08	
11/24/10	18	10	300	1.66	116.76	17.57	22.2	7.70E-08	0.949	7.30E-08	
11/24/10	18	15	300	1.69	118.87	17.89	22.2	7.65E-08	0.949	7.26E-08	*
11/24/10	18	20	300	1.64	115.36	17.36	22.2	7.70E-08	0.949	7.30E-08	*
11/24/10	18	25	300	1.65	116.06	17.47	22.2	7.79E-08	0.949	7.39E-08	*
11/24/10	18	30	300	1.65	116.06	17.47	22.2	7.77E-08	0.949	7.37E-08	*

Reported Average Hydraulic Conductivity* 7.3E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	VG
Date	11/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10632/ST-50	Depth/Elev.	-
Location	-	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	2.745	in	6.97	cm
Diameter	2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2
Volume	287.97	cm^3	0.0102	ft^3
Mass	531.10	g	1.17	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	83.3	pcf		

Moisture Content

Mass of wet sample & tare	531.10	g
Mass of dry sample & tare	384.50	g
Mass of tare	0.00	g
% Moisture	38.1	

Test Data

Speed	12	
Board Number	11	
Cell Number	8	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	165.30	cm
Min Head	164.60	cm
Maximum Gradient	23.75	
Minimum Gradient	23.65	

Final Data (After Test)

Average Height of Sample			2.740	in	6.96	cm
Average Diameter of Sample			2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2		
Volume	286.44	cm^3	0.0101	ft^3		
Mass	537.40	g	1.18	lb		

Dry Density	83.8	pcf
Vol. of Voids	146.59	cm^3
Vol. of Solids	139.84	cm^3
Void Ratio	1.05	
Saturation	104.3	%

Moisture Content

Mass of wet sample & tare	632.30	g
Mass of dry sample & tare	479.50	g
Mass of tare	95.00	g
% Moisture	39.7	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/24/10	19	0	-	2.34	164.60	23.65	22.3	-	-	-	
11/24/10	19	5	300	2.34	164.60	23.65	22.3	5.75E-08	0.947	5.45E-08	
11/24/10	19	10	300	2.35	165.30	23.75	22.3	5.74E-08	0.947	5.43E-08	
11/24/10	19	15	300	2.34	164.60	23.65	22.3	5.74E-08	0.947	5.43E-08	*
11/24/10	19	20	300	2.34	164.60	23.65	22.3	5.75E-08	0.947	5.45E-08	*
11/24/10	19	25	300	2.35	165.30	23.75	22.3	5.74E-08	0.947	5.43E-08	*
11/24/10	19	30	300	2.35	165.30	23.75	22.3	5.73E-08	0.947	5.42E-08	*

Reported Average Hydraulic Conductivity* 5.4E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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AAR AASHTO R18

Tested By	VG/KI
Date	11/25/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10633/ST-51	Depth/Elev.	-
Location	-	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	2.881	in	7.32	cm
Diameter	2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2
Volume	302.45	cm^3	0.0107	ft^3
Mass	569.10	g	1.25	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.2	pcf		

Moisture Content

Mass of wet sample & tare	569.10	g
Mass of dry sample & tare	422.80	g
Mass of tare	0.00	g
% Moisture	34.6	

Test Data

Speed	12	
Board Number	5	
Cell Number	17	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.98	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	194.14	cm
Min Head	192.73	cm
Maximum Gradient	26.42	
Minimum Gradient	26.23	

Final Data (After Test)

Average Height of Sample			2.893	in	7.35 cm
Average Diameter of Sample			2.862	in	7.27 cm
Area	6.43	in^2	41.50	cm^2	
Volume	304.98	cm^3	0.0108	ft^3	
Mass	575.70	g	1.27	lb	

Dry Density	86.5	pcf
Vol. of Voids	151.24	cm^3
Vol. of Solids	153.75	cm^3
Void Ratio	0.98	
Saturation	101.1	%

Moisture Content

Mass of wet sample & tare	640.00	g
Mass of dry sample & tare	487.10	g
Mass of tare	64.30	g
% Moisture	36.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/25/10	7	50	-	2.75	193.44	26.32	20.1	-	-	-	
11/25/10	8	0	600	2.74	192.73	26.23	20.1	5.13E-08	0.998	5.12E-08	
11/25/10	8	10	600	2.74	192.73	26.23	20.1	5.14E-08	0.998	5.13E-08	
11/25/10	8	20	600	2.76	194.14	26.42	20.1	5.13E-08	0.998	5.11E-08	*
11/25/10	8	30	600	2.75	193.44	26.32	20.1	5.12E-08	0.998	5.10E-08	*
11/25/10	8	40	600	2.75	193.44	26.32	20.1	5.13E-08	0.998	5.11E-08	*
11/25/10	8	50	600	2.74	192.73	26.23	20.1	5.13E-08	0.998	5.12E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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AAR AASHTO R18

Tested By	VG/KI
Date	11/25/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10634/ST-52	Depth/Elev.	-
Location	-	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	2.510	in	6.38	cm
Diameter	2.844	in	7.22	cm
Area	6.35	in^2	40.98	cm^2
Volume	261.29	cm^3	0.0092	ft^3
Mass	482.90	g	1.06	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	83.2	pcf		

Moisture Content

Mass of wet sample & tare	482.90	g
Mass of dry sample & tare	348.30	g
Mass of tare	0.00	g
% Moisture	38.6	

Test Data

Speed	12	
Board Number	6	
Cell Number	5	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	189.21	cm
Min Head	187.81	cm
Maximum Gradient	29.66	
Minimum Gradient	29.43	

Final Data (After Test)

Average Height of Sample			2.512	in	6.38	cm
Average Diameter of Sample			2.859	in	7.26	cm
Area	6.42	in^2	41.42	cm^2		
Volume	264.26	cm^3	0.0093	ft^3		
Mass	486.30	g	1.07	lb		

Dry Density	82.3	pcf
Vol. of Voids	137.58	cm^3
Vol. of Solids	126.68	cm^3
Void Ratio	1.09	
Saturation	100.3	%

Moisture Content

Mass of wet sample & tare	563.10	g
Mass of dry sample & tare	425.20	g
Mass of tare	76.90	g
% Moisture	39.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/25/10	7	50	-	2.68	188.51	29.54	20.1	-	-	-	
11/25/10	8	0	600	2.67	187.81	29.43	20.1	4.58E-08	0.998	4.57E-08	
11/25/10	8	10	600	2.69	189.21	29.66	20.1	4.58E-08	0.998	4.57E-08	
11/25/10	8	20	600	2.69	189.21	29.66	20.1	4.56E-08	0.998	4.55E-08	*
11/25/10	8	30	600	2.68	188.51	29.54	20.1	4.57E-08	0.998	4.56E-08	*
11/25/10	8	40	600	2.67	187.81	29.43	20.1	4.58E-08	0.998	4.57E-08	*
11/25/10	8	50	600	2.68	188.51	29.54	20.1	4.58E-08	0.998	4.57E-08	*

Reported Average Hydraulic Conductivity* 4.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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AAP AASHTO R18

Tested By	VG/KI
Date	11/25/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10635/ST-53	Depth/Elev.	-
Location	-	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	2.883	in	7.32	cm
Diameter	2.848	in	7.23	cm
Area	6.37	in^2	41.10	cm^2
Volume	300.96	cm^3	0.0106	ft^3
Mass	556.50	g	1.23	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	84.0	pcf		

Moisture Content

Mass of wet sample & tare	556.50	g
Mass of dry sample & tare	405.10	g
Mass of tare	0.00	g
% Moisture	37.4	

Test Data

Speed	12	
Board Number	3	
Cell Number	10	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	232.83	cm
Min Head	231.42	cm
Maximum Gradient	31.76	
Minimum Gradient	31.57	

Final Data (After Test)

Average Height of Sample	2.886	in	7.33	cm
Average Diameter of Sample	2.847	in	7.23	cm
Area	6.37 in^2		41.07	cm^2
Volume	301.07	cm^3	0.0106	ft^3
Mass	562.00	g	1.24	lb

Dry Density	84.0	pcf
Vol. of Voids	153.76	cm^3
Vol. of Solids	147.31	cm^3
Void Ratio	1.04	
Saturation	102.0	%

Moisture Content

Mass of wet sample & tare	637.70	g
Mass of dry sample & tare	480.80	g
Mass of tare	75.70	g
% Moisture	38.7	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/25/10	8	20	-	3.31	232.83	31.76	20.1	-	-	-	
11/25/10	8	30	600	3.30	232.12	31.67	20.1	4.30E-08	0.998	4.29E-08	
11/25/10	8	40	600	3.31	232.83	31.76	20.1	4.30E-08	0.998	4.29E-08	
11/25/10	8	50	600	3.31	232.83	31.76	20.1	4.29E-08	0.998	4.28E-08	*
11/25/10	9	0	600	3.29	231.42	31.57	20.1	4.31E-08	0.998	4.30E-08	*
11/25/10	9	10	600	3.31	232.83	31.76	20.1	4.31E-08	0.998	4.30E-08	*
11/25/10	9	20	600	3.30	232.12	31.67	20.1	4.30E-08	0.998	4.29E-08	*

Reported Average Hydraulic Conductivity* 4.3E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAP AASHTO R18

Tested By	VG/KI
Date	11/25/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10636/ST-54	Depth/Elev.	-
Location	-	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	2.851	in	7.24	cm
Diameter	2.852	in	7.24	cm
Area	6.39	in^2	41.22	cm^2
Volume	298.46	cm^3	0.0105	ft^3
Mass	539.20	g	1.19	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	80.1	pcf		

Moisture Content

Mass of wet sample & tare	539.20	g
Mass of dry sample & tare	382.90	g
Mass of tare	0.00	g
% Moisture	40.8	

Test Data

Speed	12	
Board Number	4	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	174.44	cm
Min Head	173.04	cm
Maximum Gradient	24.09	
Minimum Gradient	23.89	

Final Data (After Test)

Average Height of Sample		2.851	in	7.24	cm
Average Diameter of Sample		2.854	in	7.25	cm
Area	6.40 in^2	41.27	cm^2		
Volume	298.88 cm^3	0.0106	ft^3		
Mass	543.60 g	1.20	lb		

Dry Density	80.0	pcf
Vol. of Voids	159.62	cm^3
Vol. of Solids	139.26	cm^3
Void Ratio	1.15	
Saturation	100.6	%

Moisture Content

Mass of wet sample & tare	616.40	g
Mass of dry sample & tare	455.80	g
Mass of tare	72.90	g
% Moisture	41.9	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/25/10	8	20	-	2.46	173.04	23.89	20.1	-	-	-	
11/25/10	8	30	600	2.48	174.44	24.09	20.1	5.66E-08	0.998	5.64E-08	
11/25/10	8	40	600	2.47	173.74	23.99	20.1	5.64E-08	0.998	5.63E-08	
11/25/10	8	50	600	2.47	173.74	23.99	20.1	5.66E-08	0.998	5.64E-08	*
11/25/10	9	0	600	2.46	173.04	23.89	20.1	5.67E-08	0.998	5.65E-08	*
11/25/10	9	10	600	2.48	174.44	24.09	20.1	5.66E-08	0.998	5.64E-08	*
11/25/10	9	20	600	2.47	173.74	23.99	20.1	5.64E-08	0.998	5.63E-08	*

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Reported Average Hydraulic Conductivity* 5.6E-08 cm/sec

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	KI
Date	11/30/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10857/ST-55	Depth/Elev.	-
Location	-	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	3.038	in	7.72	cm
Diameter	2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2
Volume	320.72	cm^3	0.0113	ft^3
Mass	604.90	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.8	pcf		

Moisture Content

Mass of wet sample & tare	604.90	g
Mass of dry sample & tare	456.50	g
Mass of tare	0.00	g
% Moisture	32.5	

Test Data

Speed	12	
Board Number	7	
Cell Number	11	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	206.10	cm
Min Head	203.99	cm
Maximum Gradient	26.69	
Minimum Gradient	26.42	

Final Data (After Test)

Average Height of Sample			3.040	in	7.72 cm
Average Diameter of Sample			2.859	in	7.26 cm
Area	6.42	in^2	41.42	cm^2	
Volume	319.81	cm^3	0.0113	ft^3	
Mass	608.50	g	1.34	lb	

Dry Density	89.1	pcf
Vol. of Voids	153.84	cm^3
Vol. of Solids	165.97	cm^3
Void Ratio	0.93	
Saturation	98.9	%

Moisture Content

Mass of wet sample & tare	703.90	g
Mass of dry sample & tare	551.80	g
Mass of tare	95.30	g
% Moisture	33.3	

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	
11/30/10	14	40	-	2.92	205.39	26.60	21.2	-	-	-	
11/30/10	14	45	300	2.90	203.99	26.42	21.2	5.10E-08	0.972	4.96E-08	
11/30/10	14	50	300	2.93	206.10	26.69	21.2	5.09E-08	0.972	4.95E-08	
11/30/10	14	55	300	2.90	203.99	26.42	21.2	5.09E-08	0.972	4.95E-08	*
11/30/10	15	0	300	2.91	204.69	26.51	21.2	5.11E-08	0.972	4.96E-08	*
11/30/10	15	5	300	2.90	203.99	26.42	21.2	5.11E-08	0.972	4.96E-08	*
11/30/10	15	10	300	2.91	204.69	26.51	21.2	5.11E-08	0.972	4.96E-08	*

Reported Average Hydraulic Conductivity* 5.0E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	262
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	245			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	11/30/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10858/ST-56	Depth/Elev.	-
Location	-	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	3.049	in	7.74	cm
Diameter	2.862	in	7.27	cm
Area	6.43	in^2	41.50	cm^2
Volume	321.43	cm^3	0.0114	ft^3
Mass	580.50	g	1.28	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.4	pcf		

Moisture Content

Mass of wet sample & tare	580.50	g
Mass of dry sample & tare	424.70	g
Mass of tare	0.00	g
% Moisture	36.7	

Test Data

Speed	12	
Board Number	8	
Cell Number	18	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	200.47	cm
Min Head	199.06	cm
Maximum Gradient	25.95	
Minimum Gradient	25.77	

Final Data (After Test)

Average Height of Sample			3.041	in	7.72	cm
Average Diameter of Sample			2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2		
Volume	319.02	cm^3	0.0113	ft^3		
Mass	582.80	g	1.28	lb		

Dry Density	83.1	pcf
Vol. of Voids	164.58	cm^3
Vol. of Solids	154.44	cm^3
Void Ratio	1.07	
Saturation	96.1	%

Moisture Content

Mass of wet sample & tare	673.00	g
Mass of dry sample & tare	514.90	g
Mass of tare	90.20	g
% Moisture	37.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/30/10	14	40	-	2.84	199.77	25.86	21.2	-	-	-	
11/30/10	14	45	300	2.85	200.47	25.95	21.2	5.23E-08	0.972	5.08E-08	
11/30/10	14	50	300	2.83	199.06	25.77	21.2	5.24E-08	0.972	5.09E-08	
11/30/10	14	55	300	2.85	200.47	25.95	21.2	5.24E-08	0.972	5.09E-08	*
11/30/10	15	0	300	2.84	199.77	25.86	21.2	5.23E-08	0.972	5.08E-08	*
11/30/10	15	5	300	2.84	199.77	25.86	21.2	5.24E-08	0.972	5.09E-08	*
11/30/10	15	10	300	2.83	199.06	25.77	21.2	5.25E-08	0.972	5.10E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	11/30/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10859/ST-57	Depth/Elev.	-
Location	-	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	3.051	in	7.75	cm
Diameter	2.860	in	7.26	cm
Area	6.42	in^2	41.45	cm^2
Volume	321.19	cm^3	0.0113	ft^3
Mass	585.70	g	1.29	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	82.6	pcf		

Moisture Content

Mass of wet sample & tare	585.70	g
Mass of dry sample & tare	425.00	g
Mass of tare	0.00	g
% Moisture	37.8	

Test Data

Speed	12	
Board Number	5	
Cell Number	6	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	120.28	cm
Min Head	118.17	cm
Maximum Gradient	15.53	
Minimum Gradient	15.25	

Final Data (After Test)

Average Height of Sample			3.050	in	7.75	cm
Average Diameter of Sample			2.865	in	7.28	cm
Area	6.45	in^2	41.59	cm^2		
Volume	322.21	cm^3	0.0114	ft^3		
Mass	592.20	g	1.31	lb		

Dry Density	82.3	pcf
Vol. of Voids	167.69	cm^3
Vol. of Solids	154.52	cm^3
Void Ratio	1.09	
Saturation	99.7	%

Moisture Content

Mass of wet sample & tare	681.50	g
Mass of dry sample & tare	514.20	g
Mass of tare	89.20	g
% Moisture	39.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/30/10	15	40	-	1.68	118.17	15.25	21.2	-	-	-	
11/30/10	15	45	300	1.70	119.58	15.44	21.2	8.77E-08	0.972	8.53E-08	
11/30/10	15	50	300	1.71	120.28	15.53	21.2	8.70E-08	0.972	8.45E-08	
11/30/10	15	55	300	1.69	118.87	15.34	21.2	8.72E-08	0.972	8.48E-08	*
11/30/10	16	0	300	1.70	119.58	15.44	21.2	8.75E-08	0.972	8.50E-08	*
11/30/10	16	5	300	1.71	120.28	15.53	21.2	8.70E-08	0.972	8.45E-08	*
11/30/10	16	10	300	1.70	119.58	15.44	21.2	8.70E-08	0.972	8.45E-08	*

Reported Average Hydraulic Conductivity* 8.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Tested By	KI
Date	11/30/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10860/ST-58	Depth/Elev.	-
Location	-	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	2.580	in	6.55	cm
Diameter	2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2
Volume	272.37	cm^3	0.0096	ft^3
Mass	506.90	g	1.12	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	84.5	pcf		

Moisture Content

Mass of wet sample & tare	506.90	g
Mass of dry sample & tare	368.80	g
Mass of tare	0.00	g
% Moisture	37.4	

Test Data

Speed	12	
Board Number	6	
Cell Number	12	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	225.09	cm
Min Head	222.98	cm
Maximum Gradient	34.29	
Minimum Gradient	33.97	

Final Data (After Test)

Average Height of Sample			2.584	in	6.56	cm
Average Diameter of Sample			2.872	in	7.29	cm
Area	6.48	in^2	41.80	cm^2		
Volume	274.32	cm^3	0.0097	ft^3		
Mass	510.10	g	1.12	lb		

Dry Density	83.9	pcf
Vol. of Voids	140.21	cm^3
Vol. of Solids	134.11	cm^3
Void Ratio	1.05	
Saturation	100.8	%

Moisture Content

Mass of wet sample & tare	610.60	g
Mass of dry sample & tare	469.30	g
Mass of tare	100.50	g
% Moisture	38.3	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/30/10	15	40	-	3.17	222.98	33.97	21.2	-	-	-	
11/30/10	15	45	300	3.20	225.09	34.29	21.2	3.93E-08	0.972	3.81E-08	
11/30/10	15	50	300	3.18	223.68	34.08	21.2	3.92E-08	0.972	3.81E-08	
11/30/10	15	55	300	3.20	225.09	34.29	21.2	3.92E-08	0.972	3.81E-08	*
11/30/10	16	0	300	3.18	223.68	34.08	21.2	3.92E-08	0.972	3.81E-08	*
11/30/10	16	5	300	3.17	222.98	33.97	21.2	3.94E-08	0.972	3.83E-08	*
11/30/10	16	10	300	3.17	222.98	33.97	21.2	3.94E-08	0.972	3.83E-08	*

Reported Average Hydraulic Conductivity* 3.8E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	11/30/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10861/ST-59	Depth/Elev.	-
Location	-	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	3.049	in	7.74	cm
Diameter	2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2
Volume	319.86	cm^3	0.0113	ft^3
Mass	601.80	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.5	pcf		

Moisture Content

Mass of wet sample & tare	601.80	g
Mass of dry sample & tare	448.30	g
Mass of tare	0.00	g
% Moisture	34.2	

Test Data

Speed	12	
Board Number	1	
Cell Number	17	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	222.98	cm
Min Head	221.57	cm
Maximum Gradient	28.80	
Minimum Gradient	28.62	

Final Data (After Test)

Average Height of Sample			3.048	in	7.74 cm
Average Diameter of Sample			2.864	in	7.27 cm
Area	6.44	in^2	41.56	cm^2	
Volume	321.77	cm^3	0.0114	ft^3	
Mass	606.50	g	1.34	lb	

Dry Density	86.9	pcf
Vol. of Voids	158.76	cm^3
Vol. of Solids	163.02	cm^3
Void Ratio	0.97	
Saturation	99.6	%

Moisture Content

Mass of wet sample & tare	696.60	g
Mass of dry sample & tare	538.40	g
Mass of tare	90.10	g
% Moisture	35.3	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/30/10	14	40	-	3.17	222.98	28.80	21.2	-	-	-	
11/30/10	14	45	300	3.15	221.57	28.62	21.2	4.69E-08	0.972	4.56E-08	
11/30/10	14	50	300	3.17	222.98	28.80	21.2	4.69E-08	0.972	4.56E-08	
11/30/10	14	55	300	3.16	222.27	28.71	21.2	4.69E-08	0.972	4.55E-08	*
11/30/10	15	0	300	3.17	222.98	28.80	21.2	4.69E-08	0.972	4.55E-08	*
11/30/10	15	5	300	3.15	221.57	28.62	21.2	4.69E-08	0.972	4.56E-08	*
11/30/10	15	10	300	3.16	222.27	28.71	21.2	4.70E-08	0.972	4.57E-08	*

Reported Average Hydraulic Conductivity* 4.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	KI
Date	11/30/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10862/ST-60	Depth/Elev.	-
Location	-	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	3.044	in	7.73	cm
Diameter	2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2
Volume	317.99	cm^3	0.0112	ft^3
Mass	596.80	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.5	pcf		

Moisture Content

Mass of wet sample & tare	596.80	g
Mass of dry sample & tare	445.80	g
Mass of tare	0.00	g
% Moisture	33.9	

Test Data

Speed	12	
Board Number	2	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	216.65	cm
Min Head	215.24	cm
Maximum Gradient	28.04	
Minimum Gradient	27.86	

Final Data (After Test)

Average Height of Sample			3.042	in	7.73	cm
Average Diameter of Sample			2.849	in	7.24	cm
Area	6.37	in^2	41.13	cm^2		
Volume	317.79	cm^3	0.0112	ft^3		
Mass	600.00	g	1.32	lb		

Dry Density	87.6	pcf
Vol. of Voids	155.65	cm^3
Vol. of Solids	162.14	cm^3
Void Ratio	0.96	
Saturation	99.0	%

Moisture Content

Mass of wet sample & tare	708.30	g
Mass of dry sample & tare	554.20	g
Mass of tare	108.40	g
% Moisture	34.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/30/10	14	40	-	3.07	215.94	27.95	21.2	-	-	-	
11/30/10	14	45	300	3.08	216.65	28.04	21.2	4.86E-08	0.972	4.73E-08	
11/30/10	14	50	300	3.08	216.65	28.04	21.2	4.86E-08	0.972	4.72E-08	
11/30/10	14	55	300	3.08	216.65	28.04	21.2	4.86E-08	0.972	4.72E-08	*
11/30/10	15	0	300	3.06	215.24	27.86	21.2	4.87E-08	0.972	4.73E-08	*
11/30/10	15	5	300	3.07	215.94	27.95	21.2	4.88E-08	0.972	4.74E-08	*
11/30/10	15	10	300	3.07	215.94	27.95	21.2	4.87E-08	0.972	4.73E-08	*

Reported Average Hydraulic Conductivity* 4.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	KI
Date	11/30/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10863/ST-61	Depth/Elev.	-
Location	-	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	3.047	in	7.74	cm
Diameter	2.859	in	7.26	cm
Area	6.42	in^2	41.42	cm^2
Volume	320.55	cm^3	0.0113	ft^3
Mass	603.10	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.3	pcf		

Moisture Content

Mass of wet sample & tare	603.10	g
Mass of dry sample & tare	448.60	g
Mass of tare	0.00	g
% Moisture	34.4	

Test Data

Speed	12	
Board Number	3	
Cell Number	10	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	225.79	cm
Min Head	224.38	cm
Maximum Gradient	29.21	
Minimum Gradient	29.03	

Final Data (After Test)

Average Height of Sample		3.043	in	7.73	cm
Average Diameter of Sample		2.853	in	7.25	cm
Area	6.39 in^2	41.24	cm^2		
Volume	318.78 cm^3	0.0113	ft^3		
Mass	606.40 g	1.34	lb		

Dry Density	87.8	pcf
Vol. of Voids	155.66	cm^3
Vol. of Solids	163.13	cm^3
Void Ratio	0.95	
Saturation	101.4	%

Moisture Content

Mass of wet sample & tare	695.60	g
Mass of dry sample & tare	537.80	g
Mass of tare	89.20	g
% Moisture	35.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/30/10	16	30	-	3.19	224.38	29.03	21.3	-	-	-	
11/30/10	16	35	300	3.20	225.09	29.12	21.3	4.67E-08	0.969	4.53E-08	
11/30/10	16	40	300	3.21	225.79	29.21	21.3	4.66E-08	0.969	4.51E-08	
11/30/10	16	45	300	3.21	225.79	29.21	21.3	4.65E-08	0.969	4.51E-08	*
11/30/10	16	50	300	3.20	225.09	29.12	21.3	4.66E-08	0.969	4.51E-08	*
11/30/10	16	55	300	3.21	225.79	29.21	21.3	4.66E-08	0.969	4.51E-08	*
11/30/10	17	0	300	3.21	225.79	29.21	21.3	4.65E-08	0.969	4.51E-08	*

Reported Average Hydraulic Conductivity* 4.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	KI
Date	11/30/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10864/ST-62	Depth/Elev.	-
Location	-	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	3.190	in	8.10	cm
Diameter	2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2
Volume	334.42	cm^3	0.0118	ft^3
Mass	607.80	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.2	pcf		

Moisture Content

Mass of wet sample & tare	607.80	g
Mass of dry sample & tare	462.10	g
Mass of tare	0.00	g
% Moisture	31.5	

Test Data

Speed	12	
Board Number	4	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	211.72	cm
Min Head	210.32	cm
Maximum Gradient	27.59	
Minimum Gradient	27.41	

Final Data (After Test)

Average Height of Sample			3.021	in	7.67	cm
Average Diameter of Sample			2.856	in	7.25	cm
Area	6.41	in^2	41.33	cm^2		
Volume	317.14	cm^3	0.0112	ft^3		
Mass	611.80	g	1.35	lb		

Dry Density	90.9	pcf
Vol. of Voids	149.08	cm^3
Vol. of Solids	168.06	cm^3
Void Ratio	0.89	
Saturation	100.4	%

Moisture Content

Mass of wet sample & tare	714.20	g
Mass of dry sample & tare	564.60	g
Mass of tare	102.50	g
% Moisture	32.4	

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	
11/30/10	16	30	-	2.99	210.32	27.41	21.3	-	-	-	
11/30/10	16	35	300	3.01	211.72	27.59	21.3	4.93E-08	0.969	4.78E-08	
11/30/10	16	40	300	2.99	210.32	27.41	21.3	4.93E-08	0.969	4.78E-08	
11/30/10	16	45	300	2.99	210.32	27.41	21.3	4.94E-08	0.969	4.79E-08	*
11/30/10	16	50	300	3.01	211.72	27.59	21.3	4.93E-08	0.969	4.78E-08	*
11/30/10	16	55	300	3.00	211.02	27.50	21.3	4.92E-08	0.969	4.77E-08	*
11/30/10	17	0	300	3.01	211.72	27.59	21.3	4.92E-08	0.969	4.77E-08	*

Reported Average Hydraulic Conductivity* 4.8E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	KI
Date	12/01/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10865/ST-63	Depth/Elev.	-
Location	-	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	3.046	in	7.74	cm
Diameter	2.860	in	7.26	cm
Area	6.42	in^2	41.45	cm^2
Volume	320.67	cm^3	0.0113	ft^3
Mass	602.90	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.7	pcf		

Moisture Content

Mass of wet sample & tare	602.90	g
Mass of dry sample & tare	450.90	g
Mass of tare	0.00	g
% Moisture	33.7	

Test Data

Speed	12	
Board Number	11	
Cell Number	4	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	124.50	cm
Min Head	123.10	cm
Maximum Gradient	16.06	
Minimum Gradient	15.88	

Final Data (After Test)

Average Height of Sample			3.052	in	7.75 cm
Average Diameter of Sample			2.863	in	7.27 cm
Area	6.44	in^2	41.53	cm^2	
Volume	321.97	cm^3	0.0114	ft^3	
Mass	609.30	g	1.34	lb	

Dry Density	87.4	pcf
Vol. of Voids	158.01	cm^3
Vol. of Solids	163.96	cm^3
Void Ratio	0.96	
Saturation	100.2	%

Moisture Content

Mass of wet sample & tare	706.40	g
Mass of dry sample & tare	548.00	g
Mass of tare	97.10	g
% Moisture	35.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	9	10	-	1.75	123.10	15.88	18.7	-	-	-	
12/01/10	9	15	300	1.76	123.80	15.97	18.7	8.47E-08	1.033	8.75E-08	
12/01/10	9	20	300	1.76	123.80	15.97	18.7	8.44E-08	1.033	8.72E-08	
12/01/10	9	25	300	1.75	123.10	15.88	18.7	8.47E-08	1.033	8.75E-08	*
12/01/10	9	30	300	1.77	124.50	16.06	18.7	8.44E-08	1.033	8.72E-08	*
12/01/10	9	35	300	1.77	124.50	16.06	18.7	8.40E-08	1.033	8.67E-08	*
12/01/10	9	40	300	1.77	124.50	16.06	18.7	8.40E-08	1.033	8.67E-08	*

Reported Average Hydraulic Conductivity* 8.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	140			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10866/ST-64	Depth/Elev.	-
Location	-	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	3.044	in	7.73	cm
Diameter	2.846	in	7.23	cm
Area	6.36	in^2	41.04	cm^2
Volume	317.33	cm^3	0.0112	ft^3
Mass	586.80	g	1.29	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	83.4	pcf		

Moisture Content

Mass of wet sample & tare	586.80	g
Mass of dry sample & tare	424.00	g
Mass of tare	0.00	g
% Moisture	38.4	

Test Data

Speed	12	
Board Number	12	
Cell Number	8	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	166.71	cm
Min Head	166.71	cm
Maximum Gradient	21.59	
Minimum Gradient	21.59	

Final Data (After Test)

Average Height of Sample			3.040	in	7.72	cm
Average Diameter of Sample			2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2		
Volume	318.69	cm^3	0.0113	ft^3		
Mass	591.40	g	1.30	lb		

Dry Density	83.0	pcf
Vol. of Voids	164.48	cm^3
Vol. of Solids	154.21	cm^3
Void Ratio	1.07	
Saturation	101.7	%

Moisture Content

Mass of wet sample & tare	684.20	g
Mass of dry sample & tare	516.90	g
Mass of tare	92.90	g
% Moisture	39.5	

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	
12/01/10	9	10	-	2.37	166.71	21.59	18.7	-	-	-	
12/01/10	9	15	300	2.37	166.71	21.59	18.7	6.28E-08	1.033	6.49E-08	
12/01/10	9	20	300	2.37	166.71	21.59	18.7	6.28E-08	1.033	6.49E-08	
12/01/10	9	25	300	2.37	166.71	21.59	18.7	6.28E-08	1.033	6.49E-08	*
12/01/10	9	30	300	2.37	166.71	21.59	18.7	6.28E-08	1.033	6.49E-08	*
12/01/10	9	35	300	2.37	166.71	21.59	18.7	6.28E-08	1.033	6.49E-08	*
12/01/10	9	40	300	2.37	166.71	21.59	18.7	6.28E-08	1.033	6.49E-08	*

Reported Average Hydraulic Conductivity* 6.5E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION	USCS (ASTM D2487:2488)
NA	NA

REMARKS

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	12/01/10
Checked By	JB

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10867/ST-65	Depth/Elev.	-
Location	-	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	3.047	in	7.74	cm
Diameter	2.844	in	7.22	cm
Area	6.35	in^2	40.98	cm^2
Volume	317.19	cm^3	0.0112	ft^3
Mass	584.80	g	1.29	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	83.3	pcf		

Moisture Content

Mass of wet sample & tare	584.80	g
Mass of dry sample & tare	423.20	g
Mass of tare	0.00	g
% Moisture	38.2	

Test Data

Speed	12	
Board Number	7	
Cell Number	11	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	215.24	cm
Min Head	214.54	cm
Maximum Gradient	27.88	
Minimum Gradient	27.78	

Final Data (After Test)

Average Height of Sample			3.040	in	7.72	cm
Average Diameter of Sample			2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2		
Volume	318.69	cm^3	0.0113	ft^3		
Mass	591.00	g	1.30	lb		

Dry Density	82.9	pcf
Vol. of Voids	164.80	cm^3
Vol. of Solids	153.89	cm^3
Void Ratio	1.07	
Saturation	101.8	%

Moisture Content

Mass of wet sample & tare	703.50	g
Mass of dry sample & tare	535.70	g
Mass of tare	112.50	g
% Moisture	39.7	

TIME FUNCTION DATE	HOUR	MIN	Δ t (sec)	READING (psi)	Head (cm)	Gradient	Temp. T_x(°C)	PERMEABILITY (cm/sec) @ T_x	R_T	@ 20 °C	
12/01/10	8	10	-	3.05	214.54	27.78	18.7	-	-	-	
12/01/10	8	15	300	3.06	215.24	27.88	18.7	4.88E-08	1.033	5.04E-08	
12/01/10	8	20	300	3.05	214.54	27.78	18.7	4.88E-08	1.033	5.04E-08	
12/01/10	8	25	300	3.05	214.54	27.78	18.7	4.88E-08	1.033	5.04E-08	*
12/01/10	8	30	300	3.05	214.54	27.78	18.7	4.88E-08	1.033	5.04E-08	*
12/01/10	8	35	300	3.05	214.54	27.78	18.7	4.88E-08	1.033	5.04E-08	*
12/01/10	8	40	300	3.05	214.54	27.78	18.7	4.88E-08	1.033	5.04E-08	*

Reported Average Hydraulic Conductivity* 5.0E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10868/ST-66	Depth/Elev.	-
Location	-	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	3.040	in	7.72	cm
Diameter	2.864	in	7.27	cm
Area	6.44	in^2	41.56	cm^2
Volume	320.93	cm^3	0.0113	ft^3
Mass	606.60	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.8	pcf		

Moisture Content

Mass of wet sample & tare	606.60	g
Mass of dry sample & tare	456.50	g
Mass of tare	0.00	g
% Moisture	32.9	

Test Data

Speed	12	
Board Number	8	
Cell Number	18	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	110.43	cm
Min Head	110.43	cm
Maximum Gradient	14.29	
Minimum Gradient	14.29	

Final Data (After Test)

Average Height of Sample			3.042	in	7.73	cm
Average Diameter of Sample			2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2		
Volume	319.13	cm^3	0.0113	ft^3		
Mass	613.10	g	1.35	lb		

Dry Density	89.3	pcf
Vol. of Voids	153.13	cm^3
Vol. of Solids	166.00	cm^3
Void Ratio	0.92	
Saturation	102.3	%

Moisture Content

Mass of wet sample & tare	714.90	g
Mass of dry sample & tare	558.30	g
Mass of tare	101.80	g
% Moisture	34.3	

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	
12/01/10	8	10	-	1.57	110.43	14.29	18.7	-	-	-	
12/01/10	8	15	300	1.57	110.43	14.29	18.7	9.49E-08	1.033	9.80E-08	
12/01/10	8	20	300	1.57	110.43	14.29	18.7	9.49E-08	1.033	9.80E-08	
12/01/10	8	25	300	1.57	110.43	14.29	18.7	9.49E-08	1.033	9.80E-08	*
12/01/10	8	30	300	1.57	110.43	14.29	18.7	9.49E-08	1.033	9.80E-08	*
12/01/10	8	35	300	1.57	110.43	14.29	18.7	9.49E-08	1.033	9.80E-08	*
12/01/10	8	40	300	1.57	110.43	14.29	18.7	9.49E-08	1.033	9.80E-08	*

Reported Average Hydraulic Conductivity* 9.8E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	262
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	215
Syringe ID #	245			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 21	S. Type	UD
Sample ID	10869/ST-67	Depth/Elev.	-
Location	-	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	3.046	in	7.74	cm
Diameter	2.861	in	7.27	cm
Area	6.43	in^2	41.48	cm^2
Volume	320.89	cm^3	0.0113	ft^3
Mass	599.20	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	85.7	pcf		

Moisture Content

Mass of wet sample & tare	599.20	g
Mass of dry sample & tare	440.50	g
Mass of tare	0.00	g
% Moisture	36.0	

Test Data

Speed	12	
Board Number	5	
Cell Number	6	
Flow Pump Number	2A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	111.84	cm
Min Head	111.84	cm
Maximum Gradient	14.47	
Minimum Gradient	14.47	

Final Data (After Test)

Average Height of Sample			3.042	in	7.73 cm
Average Diameter of Sample			2.862	in	7.27 cm
Area	6.43	in^2	41.50	cm^2	
Volume	320.69	cm^3	0.0113	ft^3	
Mass	603.60	g	1.33	lb	

Dry Density	85.7	pcf
Vol. of Voids	160.51	cm^3
Vol. of Solids	160.18	cm^3
Void Ratio	1.00	
Saturation	101.6	%

Moisture Content

Mass of wet sample & tare	697.60	g
Mass of dry sample & tare	534.50	g
Mass of tare	94.00	g
% Moisture	37.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	9	15	-	1.59	111.84	14.47	18.7	-	-	-	
12/01/10	9	20	300	1.59	111.84	14.47	18.7	9.32E-08	1.033	9.63E-08	
12/01/10	9	25	300	1.59	111.84	14.47	18.7	9.32E-08	1.033	9.63E-08	
12/01/10	9	30	300	1.59	111.84	14.47	18.7	9.32E-08	1.033	9.63E-08	*
12/01/10	9	35	300	1.59	111.84	14.47	18.7	9.32E-08	1.033	9.63E-08	*
12/01/10	9	40	300	1.59	111.84	14.47	18.7	9.32E-08	1.033	9.63E-08	*
12/01/10	9	45	300	1.59	111.84	14.47	18.7	9.32E-08	1.033	9.63E-08	*

Reported Average Hydraulic Conductivity* 9.6E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	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

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Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10870/ST-68	Depth/Elev.	-
Location	-	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	3.038	in	7.72	cm
Diameter	2.861	in	7.27	cm
Area	6.43	in^2	41.48	cm^2
Volume	320.05	cm^3	0.0113	ft^3
Mass	606.80	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	88.5	pcf		

Moisture Content

Mass of wet sample & tare	606.80	g
Mass of dry sample & tare	453.80	g
Mass of tare	0.00	g
% Moisture	33.7	

Test Data

Speed	12	
Board Number	6	
Cell Number	12	
Flow Pump Number	2B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	213.13	cm
Min Head	211.02	cm
Maximum Gradient	27.62	
Minimum Gradient	27.35	

Final Data (After Test)

Average Height of Sample			3.038	in	7.72	cm
Average Diameter of Sample			2.862	in	7.27	cm
Area	6.43	in^2	41.50	cm^2		
Volume	320.27	cm^3	0.0113	ft^3		
Mass	610.10	g	1.35	lb		

Dry Density	88.4	pcf
Vol. of Voids	155.25	cm^3
Vol. of Solids	165.02	cm^3
Void Ratio	0.94	
Saturation	100.7	%

Moisture Content

Mass of wet sample & tare	703.30	g
Mass of dry sample & tare	547.00	g
Mass of tare	93.20	g
% Moisture	34.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	9	15	-	3.01	211.72	27.44	18.7	-	-	-	
12/01/10	9	20	300	3.02	212.43	27.53	18.7	4.91E-08	1.033	5.07E-08	
12/01/10	9	25	300	3.03	213.13	27.62	18.7	4.89E-08	1.033	5.05E-08	
12/01/10	9	30	300	3.02	212.43	27.53	18.7	4.89E-08	1.033	5.05E-08	*
12/01/10	9	35	300	3.00	211.02	27.35	18.7	4.92E-08	1.033	5.08E-08	*
12/01/10	9	40	300	3.02	212.43	27.53	18.7	4.92E-08	1.033	5.08E-08	*
12/01/10	9	45	300	3.03	213.13	27.62	18.7	4.89E-08	1.033	5.05E-08	*

Reported Average Hydraulic Conductivity* 5.1E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10871/ST-69	Depth/Elev.	-
Location	-	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	3.042	in	7.73	cm
Diameter	2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2
Volume	319.57	cm^3	0.0113	ft^3
Mass	598.70	g	1.32	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	86.1	pcf		

Moisture Content

Mass of wet sample & tare	598.70	g
Mass of dry sample & tare	440.90	g
Mass of tare	0.00	g
% Moisture	35.8	

Test Data

Speed	12	
Board Number	1	
Cell Number	12	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	115.36	cm
Min Head	113.95	cm
Maximum Gradient	14.98	
Minimum Gradient	14.80	

Final Data (After Test)

Average Height of Sample		3.032	in	7.70	cm
Average Diameter of Sample		2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2	
Volume	318.52	cm^3	0.0112	ft^3	
Mass	601.00	g	1.32	lb	

Dry Density	86.4	pcf
Vol. of Voids	158.20	cm^3
Vol. of Solids	160.33	cm^3
Void Ratio	0.99	
Saturation	101.2	%

Moisture Content

Mass of wet sample & tare	702.80	g
Mass of dry sample & tare	542.70	g
Mass of tare	101.80	g
% Moisture	36.3	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	8	5	-	1.62	113.95	14.80	18.7	-	-	-	
12/01/10	8	10	300	1.63	114.65	14.89	18.7	9.12E-08	1.033	9.42E-08	
12/01/10	8	15	300	1.64	115.36	14.98	18.7	9.07E-08	1.033	9.37E-08	
12/01/10	8	20	300	1.63	114.65	14.89	18.7	9.07E-08	1.033	9.37E-08	*
12/01/10	8	25	300	1.63	114.65	14.89	18.7	9.09E-08	1.033	9.39E-08	*
12/01/10	8	30	300	1.63	114.65	14.89	18.7	9.09E-08	1.033	9.39E-08	*
12/01/10	8	35	300	1.63	114.65	14.89	18.7	9.09E-08	1.033	9.39E-08	*

Reported Average Hydraulic Conductivity* 9.4E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10872/ST-70	Depth/Elev.	-
Location	-	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	3.050	in	7.75	cm
Diameter	2.859	in	7.26	cm
Area	6.42	in^2	41.42	cm^2
Volume	320.86	cm^3	0.0113	ft^3
Mass	606.10	g	1.34	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	87.8	pcf		

Moisture Content

Mass of wet sample & tare	606.10	g
Mass of dry sample & tare	451.60	g
Mass of tare	0.00	g
% Moisture	34.2	

Test Data

Speed	12	
Board Number	2	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	157.56	cm
Min Head	156.15	cm
Maximum Gradient	20.36	
Minimum Gradient	20.18	

Final Data (After Test)

Average Height of Sample			3.047	in	7.74	cm
Average Diameter of Sample			2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2		
Volume	320.10	cm^3	0.0113	ft^3		
Mass	610.80	g	1.35	lb		

Dry Density	88.0	pcf
Vol. of Voids	155.85	cm^3
Vol. of Solids	164.25	cm^3
Void Ratio	0.95	
Saturation	102.1	%

Moisture Content

Mass of wet sample & tare	709.20	g
Mass of dry sample & tare	550.10	g
Mass of tare	98.50	g
% Moisture	35.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	8	5	-	2.22	156.15	20.18	18.7	-	-	-	
12/01/10	8	10	300	2.23	156.86	20.27	18.7	6.70E-08	1.033	6.92E-08	
12/01/10	8	15	300	2.24	157.56	20.36	18.7	6.67E-08	1.033	6.88E-08	
12/01/10	8	20	300	2.23	156.86	20.27	18.7	6.67E-08	1.033	6.88E-08	*
12/01/10	8	25	300	2.23	156.86	20.27	18.7	6.68E-08	1.033	6.90E-08	*
12/01/10	8	30	300	2.23	156.86	20.27	18.7	6.68E-08	1.033	6.90E-08	*
12/01/10	8	35	300	2.23	156.86	20.27	18.7	6.68E-08	1.033	6.90E-08	*

Reported Average Hydraulic Conductivity* 6.9E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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AAP AASHTO R18

Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10873/ST-71	Depth/Elev.	-
Location	-	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	3.042	in	7.73	cm
Diameter	2.851	in	7.24	cm
Area	6.38	in^2	41.19	cm^2
Volume	318.23	cm^3	0.0112	ft^3
Mass	605.30	g	1.33	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	89.1	pcf		

Moisture Content

Mass of wet sample & tare	605.30	g
Mass of dry sample & tare	454.20	g
Mass of tare	0.00	g
% Moisture	33.3	

Test Data

Speed	12	
Board Number	3	
Cell Number	10	
Flow Pump Number	1A	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	227.20	cm
Min Head	226.49	cm
Maximum Gradient	29.36	
Minimum Gradient	29.27	

Final Data (After Test)

Average Height of Sample			3.047	in	7.74	cm
Average Diameter of Sample			2.854	in	7.25	cm
Area	6.40	in^2	41.27	cm^2		
Volume	319.43	cm^3	0.0113	ft^3		
Mass	611.10	g	1.35	lb		

Dry Density	88.7	pcf
Vol. of Voids	154.29	cm^3
Vol. of Solids	165.14	cm^3
Void Ratio	0.93	
Saturation	101.7	%

Moisture Content

Mass of wet sample & tare	694.80	g
Mass of dry sample & tare	537.80	g
Mass of tare	83.60	g
% Moisture	34.6	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	11	10	-	3.23	227.20	29.36	19.2	-	-	-	
12/01/10	11	15	300	3.22	226.49	29.27	19.2	4.63E-08	1.020	4.72E-08	
12/01/10	11	20	300	3.23	227.20	29.36	19.2	4.63E-08	1.020	4.72E-08	
12/01/10	11	25	300	3.22	226.49	29.27	19.2	4.63E-08	1.020	4.72E-08	*
12/01/10	11	30	300	3.22	226.49	29.27	19.2	4.64E-08	1.020	4.73E-08	*
12/01/10	11	35	300	3.23	227.20	29.36	19.2	4.63E-08	1.020	4.72E-08	*
12/01/10	11	40	300	3.22	226.49	29.27	19.2	4.63E-08	1.020	4.72E-08	*

Reported Average Hydraulic Conductivity* 4.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAR AASHTO R18

Tested By	KI
Date	12/01/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-7
Pr. Name	CMS Cell 2I	S. Type	UD
Sample ID	10874/ST-72	Depth/Elev.	-
Location	-	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	3.047	in	7.74	cm
Diameter	2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2
Volume	320.10	cm^3	0.0113	ft^3
Mass	591.10	g	1.30	lb
Specific Gravity	2.750	(Assumed)		
Dry Density	83.4	pcf		

Moisture Content

Mass of wet sample & tare	591.10	g
Mass of dry sample & tare	427.80	g
Mass of tare	0.00	g
% Moisture	38.2	

Test Data

Speed	12	
Board Number	4	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.60E-05	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	141.38	cm
Min Head	139.98	cm
Maximum Gradient	18.36	
Minimum Gradient	18.18	

Final Data (After Test)

Average Height of Sample		3.031	in	7.70	cm
Average Diameter of Sample		2.841	in	7.22	cm
Area	6.34	in^2	40.90	cm^2	
Volume	314.86	cm^3	0.0111	ft^3	
Mass	591.80	g	1.30	lb	

Dry Density	84.8	pcf
Vol. of Voids	159.27	cm^3
Vol. of Solids	155.59	cm^3
Void Ratio	1.02	
Saturation	102.9	%

Moisture Content

Mass of wet sample & tare	732.30	g
Mass of dry sample & tare	568.40	g
Mass of tare	140.60	g
% Moisture	38.3	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/01/10	11	10	-	1.99	139.98	18.18	19.2	-	-	-	
12/01/10	11	15	300	2.01	141.38	18.36	19.2	7.49E-08	1.020	7.64E-08	
12/01/10	11	20	300	1.99	139.98	18.18	19.2	7.49E-08	1.020	7.64E-08	
12/01/10	11	25	300	1.99	139.98	18.18	19.2	7.53E-08	1.020	7.68E-08	*
12/01/10	11	30	300	2.00	140.68	18.27	19.2	7.51E-08	1.020	7.66E-08	*
12/01/10	11	35	300	2.00	140.68	18.27	19.2	7.49E-08	1.020	7.64E-08	*
12/01/10	11	40	300	1.99	139.98	18.18	19.2	7.51E-08	1.020	7.66E-08	*

Reported Average Hydraulic Conductivity* 7.7E-08 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS:

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

of NORTH CAROLINA, PLLC

SECTION G-3

Laboratory Bag Gradation Sample Test Results

TIMELY ENGINEERING SOIL TESTS, LLC
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Phone: 770-938-8233 Fax: 770-923-8973
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Web: www.test-llc.com

Summary of Soil Testing (CB-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3" Sieve	% Finer 1" 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
10654	CB-1	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10655	CB-2	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10656	CB-3	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10657	CB-4	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10658	CB-5	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10659	CB-6	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10660	CB-7	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10661	CB-8	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10662	CB-9	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10663	CB-10	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10664	CB-11	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10665	CB-12	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10666	CB-13	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10667	CB-14	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10668	CB-15	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10669	CB-16	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10670	CB-17	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10671	CB-18	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10672	CB-19	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10673	CB-20	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10674	CB-21	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10675	CB-22	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10676	CB-23	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10677	CB-24	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10678	CB-25	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10679	CB-26	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10680	CB-27	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10681	CB-28	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Summary of Soil Testing (CB-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3" Sieve	% Finer 1" 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
10682	CB-29	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10683	CB-30	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10684	CB-31	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10685	CB-32	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10686	CB-33	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10687	CB-34	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10688	CB-35	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10689	CB-36	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10690	CB-37	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10691	CB-38	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10692	CB-39	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10693	CB-40	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10694	CB-41	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10695	CB-42	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10696	CB-43	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10697	CB-44	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10698	CB-45	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10699	CB-46	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10700	CB-47	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10701	CB-48	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10702	CB-49	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10703	CB-50	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10704	CB-51	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10705	CB-52	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10706	CB-53	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10707	CB-54	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10708	CB-55	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10709	CB-56	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Summary of Soil Testing (CB-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3" Sieve	% Finer 1" 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
10710	CB-57	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10711	CB-58	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10712	CB-59	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10713	CB-60	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10714	CB-61	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10715	CB-62	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10716	CB-63	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10717	CB-64	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10718	CB-65	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10719	CB-66	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10720	CB-67	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10721	CB-68	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10722	CB-69	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10723	CB-70	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10724	CB-71	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10725	CB-72	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10726	CB-73	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10727	CB-74	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10728	CB-75	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10729	CB-76	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10730	CB-77	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10731	CB-78	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10732	CB-79	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10733	CB-80	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10734	CB-81	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10735	CB-82	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10736	CB-83	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10737	CB-84	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Summary of Soil Testing (CB-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3" Sieve	% Finer 1" 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
10738	CB-85	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10739	CB-86	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10740	CB-87	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10741	CB-88	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10742	CB-89	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10743	CB-90	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10744	CB-91	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10745	CB-92	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10746	CB-93	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10747	CB-94	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10748	CB-95	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10749	CB-96	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10750	CB-97	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10751	CB-98	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10752	CB-99	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10753	CB-100	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10754	CB-101	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10755	CB-102	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10756	CB-103	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10757	CB-104	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10758	CB-105	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10759	CB-106	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10760	CB-107	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10761	CB-108	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10762	CB-109	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10763	CB-110	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10764	CB-111	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10765	CB-112	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Summary of Soil Testing (CB-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3" Sieve	% Finer 1" 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
10766	CB-113	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10767	CB-114	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10768	CB-115	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10769	CB-116	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10770	CB-117	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10771	CB-118	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10772	CB-119	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10773	CB-120	-	-	100.0	-	-	-	-	-	-	-	-	-	-
10774	CB-121	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10775	CB-122	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10776	CB-123	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10777	CB-124	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10778	CB-125	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10779	CB-126	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10780	CB-127	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10781	CB-128	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10782	CB-129	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10783	CB-130	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10784	CB-131	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10785	CB-132	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10786	CB-133	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10787	CB-134	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10788	CB-135	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10789	CB-136	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10790	CB-137	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10791	CB-138	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10792	CB-139	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10793	CB-140	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-

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Summary of Soil Testing (CB-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3" Sieve	% Finer 1" 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
10794	CB-141	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10795	CB-142	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10796	CB-143	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10797	CB-144	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10798	CB-145	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10799	CB-146	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10800	CB-147	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10801	CB-148	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10802	CB-149	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10803	CB-150	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10804	CB-151	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10805	CB-152	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10806	CB-153	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10807	CB-154	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10808	CB-155	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10809	CB-156	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10810	CB-157	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10811	CB-158	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10812	CB-159	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-
10813	CB-160	-	-	100.0	100.0	-	-	-	-	-	-	-	-	-

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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10654/CB-1	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	443.4
Mass of Dry Sample & Tare, g	363.8
Mass of Tare, g	96.4
Moisture Content, %	29.8

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3788.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2919.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10655/CB-2	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	388.6
Mass of Dry Sample & Tare, g	318.0
Mass of Tare, g	108.4
Moisture Content, %	33.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3738.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2796.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10656/CB-3	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	379.1
Mass of Dry Sample & Tare, g	305.8
Mass of Tare, g	95.0
Moisture Content, %	34.8

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3552.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2636.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	16

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10657/CB-4	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	307.7
Mass of Dry Sample & Tare, g	255.0
Mass of Tare, g	99.9
Moisture Content, %	34.0

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3877.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2894.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10658/CB-5	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	412.2
Mass of Dry Sample & Tare, g	330.4
Mass of Tare, g	101.6
Moisture Content, %	35.8

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3837.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2826.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10659/CB-6	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	472.0
Mass of Dry Sample & Tare, g	371.4
Mass of Tare, g	92.9
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3912.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2874.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10660/CB-7	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	359.1
Mass of Dry Sample & Tare, g	295.2
Mass of Tare, g	105.9
Moisture Content, %	33.8

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3440.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2572.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10661/CB-8	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	411.4
Mass of Dry Sample & Tare, g	327.9
Mass of Tare, g	92.6
Moisture Content, %	35.5

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3458.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2552.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10662/CB-9	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	397.0
Mass of Dry Sample & Tare, g	319.5
Mass of Tare, g	101.9
Moisture Content, %	35.6

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3488.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2572.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10663/CB-10	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	349.0
Mass of Dry Sample & Tare, g	277.5
Mass of Tare, g	85.3
Moisture Content, %	37.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3006.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2191.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10664/CB-11	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	486.6
Mass of Dry Sample & Tare, g	378.4
Mass of Tare, g	90.5
Moisture Content, %	37.6

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3068.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2230.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10665/CB-12	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	417.6
Mass of Dry Sample & Tare, g	335.1
Mass of Tare, g	112.5
Moisture Content, %	37.1

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3576.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2609.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10666/CB-13	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	470.6
Mass of Dry Sample & Tare, g	371.5
Mass of Tare, g	101.8
Moisture Content, %	36.7

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3373.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2467.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10667/CB-14	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	453.8
Mass of Dry Sample & Tare, g	365.4
Mass of Tare, g	102.5
Moisture Content, %	33.6

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3393.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2539.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10668/CB-15	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	384.1
Mass of Dry Sample & Tare, g	307.9
Mass of Tare, g	97.1
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3385.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2486.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Checked By	LB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10669/CB-16	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	424.2
Mass of Dry Sample & Tare, g	335.8
Mass of Tare, g	100.4
Moisture Content, %	37.6

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3135.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2279.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10670/CB-17	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	385.8
Mass of Dry Sample & Tare, g	308.5
Mass of Tare, g	89.2
Moisture Content, %	35.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3562.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2634.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10671/CB-18	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	421.5
Mass of Dry Sample & Tare, g	338.0
Mass of Tare, g	98.5
Moisture Content, %	34.9

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3786.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2807.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10672/CB-19	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	389.6
Mass of Dry Sample & Tare, g	310.8
Mass of Tare, g	97.0
Moisture Content, %	36.9

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3631.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2653.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10673/CB-20	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	454.4
Mass of Dry Sample & Tare, g	365.0
Mass of Tare, g	95.0
Moisture Content, %	33.1

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3555.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2671.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10674/CB-21	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	426.0
Mass of Dry Sample & Tare, g	347.2
Mass of Tare, g	107.3
Moisture Content, %	32.8

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3314.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2495.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	11/29/10
		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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10675/CB-22	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	392.4
Mass of Dry Sample & Tare, g	331.7
Mass of Tare, g	140.5
Moisture Content, %	31.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3265.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2478.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10676/CB-23	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	333.9
Mass of Dry Sample & Tare, g	273.9
Mass of Tare, g	83.6
Moisture Content, %	31.5

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3151.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2396.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10677/CB-24	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	395.5
Mass of Dry Sample & Tare, g	322.2
Mass of Tare, g	98.5
Moisture Content, %	32.8

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3604.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2714.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10678/CB-25	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	360.5
Mass of Dry Sample & Tare, g	291.5
Mass of Tare, g	95.1
Moisture Content, %	35.1

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3432.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2540.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10679/CB-26	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	475.6
Mass of Dry Sample & Tare, g	379.8
Mass of Tare, g	91.2
Moisture Content, %	33.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3788.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2844.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10680/CB-27	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	410.6
Mass of Dry Sample & Tare, g	329.3
Mass of Tare, g	94.3
Moisture Content, %	34.6

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3979.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2956.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

DESCRIPTION: NA

USCS (ASTM D2487; D2488): NA

AASHTO (M 145): NA

Requested sieve ID #	31
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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10681/CB-28	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	430.7
Mass of Dry Sample & Tare, g	341.9
Mass of Tare, g	90.8
Moisture Content, %	35.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3411.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2520.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

DESCRIPTION NA

USCS (ASTM D2487; D2488) NA

AASHTO (M 145) NA

Requested sieve ID #	31
Balance ID #	1/6/7/79
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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10682/CB-29	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	355.2
Mass of Dry Sample & Tare, g	289.9
Mass of Tare, g	108.3
Moisture Content, %	36.0

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3630.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2670.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10683/CB-30	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	380.4
Mass of Dry Sample & Tare, g	303.2
Mass of Tare, g	95.3
Moisture Content, %	37.1

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3359.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2450.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10684/CB-31	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	381.2
Mass of Dry Sample & Tare, g	305.3
Mass of Tare, g	95.0
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3315.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2436.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10685/CB-32	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	385.6
Mass of Dry Sample & Tare, g	303.7
Mass of Tare, g	90.7
Moisture Content, %	38.5

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	2945.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2127.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10686/CB-33	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	353.1
Mass of Dry Sample & Tare, g	287.1
Mass of Tare, g	104.1
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3455.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2539.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10687/CB-34	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	490.9
Mass of Dry Sample & Tare, g	390.8
Mass of Tare, g	93.7
Moisture Content, %	33.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3211.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2401.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10688/CB-35	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	266.1
Mass of Dry Sample & Tare, g	220.5
Mass of Tare, g	90.1
Moisture Content, %	35.0

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	2855.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2115.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10689/CB-36	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	378.0
Mass of Dry Sample & Tare, g	303.8
Mass of Tare, g	98.7
Moisture Content, %	36.2

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	2958.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2172.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10690/CB-37	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	399.4
Mass of Dry Sample & Tare, g	318.8
Mass of Tare, g	95.6
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	2825.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2075.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10691/CB-38	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	382.8
Mass of Dry Sample & Tare, g	303.7
Mass of Tare, g	89.2
Moisture Content, %	36.9

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3074.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2245.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10692/CB-39	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	390.1
Mass of Dry Sample & Tare, g	307.3
Mass of Tare, g	89.2
Moisture Content, %	38.0

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	2964.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2148.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10693/CB-40	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	334.5
Mass of Dry Sample & Tare, g	274.7
Mass of Tare, g	101.4
Moisture Content, %	34.5

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3445.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2561.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10694/CB-41	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	476.6
Mass of Dry Sample & Tare, g	372.9
Mass of Tare, g	90.4
Moisture Content, %	36.7

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3583.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2620.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10695/CB-42	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	492.5
Mass of Dry Sample & Tare, g	386.7
Mass of Tare, g	93.2
Moisture Content, %	36.0

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3506.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2577.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10696/CB-43	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	411.7
Mass of Dry Sample & Tare, g	326.9
Mass of Tare, g	69.8
Moisture Content, %	33.0

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3573.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2687.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10697/CB-44	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	355.2
Mass of Dry Sample & Tare, g	279.8
Mass of Tare, g	74.0
Moisture Content, %	36.6

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3456.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2529.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10698/CB-45	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	333.6
Mass of Dry Sample & Tare, g	264.2
Mass of Tare, g	74.1
Moisture Content, %	36.5

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3302.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2419.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10699/CB-46	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	333.5
Mass of Dry Sample & Tare, g	265.0
Mass of Tare, g	73.4
Moisture Content, %	35.8

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3159.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2327.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10700/CB-47	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	310.3
Mass of Dry Sample & Tare, g	248.0
Mass of Tare, g	71.7
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3689.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2726.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10701/CB-48	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	358.4
Mass of Dry Sample & Tare, g	287.1
Mass of Tare, g	87.3
Moisture Content, %	35.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3556.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2621.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10702/CB-49	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	346.0
Mass of Dry Sample & Tare, g	280.6
Mass of Tare, g	80.0
Moisture Content, %	32.6

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3566.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2689.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10703/CB-50	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	413.1
Mass of Dry Sample & Tare, g	333.4
Mass of Tare, g	79.3
Moisture Content, %	31.4

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3755.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2858.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10704/CB-51	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	437.8
Mass of Dry Sample & Tare, g	355.5
Mass of Tare, g	82.5
Moisture Content, %	30.1

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3739.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2873.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10705/CB-52	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	367.4
Mass of Dry Sample & Tare, g	296.0
Mass of Tare, g	72.6
Moisture Content, %	32.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3513.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2662.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10706/CB-53	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	398.3
Mass of Dry Sample & Tare, g	322.7
Mass of Tare, g	74.0
Moisture Content, %	30.4

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3660.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2807.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10707/CB-54	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	346.5
Mass of Dry Sample & Tare, g	274.0
Mass of Tare, g	63.4
Moisture Content, %	34.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3919.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2916.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10708/CB-55	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	356.2
Mass of Dry Sample & Tare, g	287.3
Mass of Tare, g	78.4
Moisture Content, %	33.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3792.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2852.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10709/CB-56	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	352.0
Mass of Dry Sample & Tare, g	281.2
Mass of Tare, g	69.4
Moisture Content, %	33.4

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3482.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2610.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10710/CB-57	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	266.1
Mass of Dry Sample & Tare, g	218.7
Mass of Tare, g	61.6
Moisture Content, %	30.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3375.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2593.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10711/CB-58	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	257.1
Mass of Dry Sample & Tare, g	208.1
Mass of Tare, g	60.4
Moisture Content, %	33.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3083.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2315.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10712/CB-59	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	273.7
Mass of Dry Sample & Tare, g	220.7
Mass of Tare, g	61.1
Moisture Content, %	33.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3400.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2552.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10713/CB-60	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	248.4
Mass of Dry Sample & Tare, g	199.5
Mass of Tare, g	60.1
Moisture Content, %	35.1

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3560.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2635.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10714/CB-61	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	236.7
Mass of Dry Sample & Tare, g	190.7
Mass of Tare, g	60.1
Moisture Content, %	35.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3456.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2556.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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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Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10715/CB-62	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	288.1
Mass of Dry Sample & Tare, g	229.2
Mass of Tare, g	60.9
Moisture Content, %	35.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3857.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2857.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10716/CB-63	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	270.1
Mass of Dry Sample & Tare, g	215.1
Mass of Tare, g	61.1
Moisture Content, %	35.7

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3831.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2823.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	11/29/1(
		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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10717/CB-64	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	195.4
Mass of Dry Sample & Tare, g	159.9
Mass of Tare, g	59.4
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3522.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2603.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
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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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10718/CB-65	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	227.7
Mass of Dry Sample & Tare, g	185.1
Mass of Tare, g	60.6
Moisture Content, %	34.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3668.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2733.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	11/29/10
		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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10719/CB-66	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	211.2
Mass of Dry Sample & Tare, g	171.8
Mass of Tare, g	60.1
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3726.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2755.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10720/CB-67	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	228.1
Mass of Dry Sample & Tare, g	184.5
Mass of Tare, g	62.2
Moisture Content, %	35.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3128.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2306.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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		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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10721/CB-68	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	249.1
Mass of Dry Sample & Tare, g	199.8
Mass of Tare, g	60.0
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3981.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2943.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10722/CB-69	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	216.4
Mass of Dry Sample & Tare, g	176.1
Mass of Tare, g	61.1
Moisture Content, %	35.0

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3636.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2692.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10723/CB-70	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	247.8
Mass of Dry Sample & Tare, g	198.1
Mass of Tare, g	59.9
Moisture Content, %	36.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3838.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2823.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10724/CB-71	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	239.8
Mass of Dry Sample & Tare, g	192.2
Mass of Tare, g	60.4
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3882.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2852.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10725/CB-72	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	192.1
Mass of Dry Sample & Tare, g	156.9
Mass of Tare, g	59.7
Moisture Content, %	36.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3897.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2861.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10726/CB-73	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	239.8
Mass of Dry Sample & Tare, g	192.0
Mass of Tare, g	61.9
Moisture Content, %	36.7

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3873.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2832.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	[illegible]

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10727/CB-74	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	216.6
Mass of Dry Sample & Tare, g	175.0
Mass of Tare, g	59.8
Moisture Content, %	36.1

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3666.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2693.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10728/CB-75	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	231.2
Mass of Dry Sample & Tare, g	185.5
Mass of Tare, g	60.0
Moisture Content, %	36.4

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3553.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2604.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10729/CB-76	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	238.8
Mass of Dry Sample & Tare, g	190.5
Mass of Tare, g	58.8
Moisture Content, %	36.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	4081.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2986.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10730/CB-77	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	197.8
Mass of Dry Sample & Tare, g	161.9
Mass of Tare, g	60.3
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3685.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2722.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2l	S. Type	Bulk
Sample ID	10731/CB-78	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	266.3
Mass of Dry Sample & Tare, g	212.4
Mass of Tare, g	61.3
Moisture Content, %	35.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3864.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2848.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10732/CB-79	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	259.6
Mass of Dry Sample & Tare, g	207.3
Mass of Tare, g	62.1
Moisture Content, %	36.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3754.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2760.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10733/CB-80	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	229.9
Mass of Dry Sample & Tare, g	186.3
Mass of Tare, g	61.6
Moisture Content, %	35.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3293.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2440.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10734/CB-81	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	207.2
Mass of Dry Sample & Tare, g	173.0
Mass of Tare, g	59.6
Moisture Content, %	30.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3818.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2933.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10735/CB-82	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	323.6
Mass of Dry Sample & Tare, g	264.4
Mass of Tare, g	61.9
Moisture Content, %	29.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3671.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2841.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10736/CB-83	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	379.9
Mass of Dry Sample & Tare, g	307.2
Mass of Tare, g	75.7
Moisture Content, %	31.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3883.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2955.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10737/CB-84	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	310.5
Mass of Dry Sample & Tare, g	244.0
Mass of Tare, g	67.0
Moisture Content, %	37.6

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3701.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2690.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10738/CB-85	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	379.0
Mass of Dry Sample & Tare, g	291.6
Mass of Tare, g	64.3
Moisture Content, %	38.5

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3670.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2650.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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		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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10739/CB-86	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	334.2
Mass of Dry Sample & Tare, g	264.1
Mass of Tare, g	76.9
Moisture Content, %	37.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3777.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2748.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10740/CB-87	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	326.0
Mass of Dry Sample & Tare, g	260.6
Mass of Tare, g	73.2
Moisture Content, %	34.9

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3841.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2847.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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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		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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10741/CB-88	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	304.6
Mass of Dry Sample & Tare, g	242.7
Mass of Tare, g	72.7
Moisture Content, %	36.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3661.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2684.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10742/CB-89	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	342.8
Mass of Dry Sample & Tare, g	270.5
Mass of Tare, g	72.9
Moisture Content, %	36.6

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3537.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2589.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	[illegible]

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10743/CB-90	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	296.9
Mass of Dry Sample & Tare, g	239.9
Mass of Tare, g	78.0
Moisture Content, %	35.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3530.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2610.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10744/CB-91	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	302.2
Mass of Dry Sample & Tare, g	243.2
Mass of Tare, g	75.7
Moisture Content, %	35.2

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3366.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2489.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10745/CB-92	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	341.0
Mass of Dry Sample & Tare, g	271.8
Mass of Tare, g	73.8
Moisture Content, %	34.9

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3711.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2750.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10746/CB-93	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	433.4
Mass of Dry Sample & Tare, g	337.5
Mass of Tare, g	68.7
Moisture Content, %	35.7

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3851.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2838.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	[illegible]

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10747/CB-94	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	303.0
Mass of Dry Sample & Tare, g	240.7
Mass of Tare, g	70.4
Moisture Content, %	36.6

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3696.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2706.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10748/CB-95	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	396.8
Mass of Dry Sample & Tare, g	321.7
Mass of Tare, g	116.5
Moisture Content, %	36.6

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3949.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2891.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, %	100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10749/CB-96	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	408.1
Mass of Dry Sample & Tare, g	330.7
Mass of Tare, g	124.0
Moisture Content, %	37.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3942.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2868.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10750/CB-97	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	437.4
Mass of Dry Sample & Tare, g	354.9
Mass of Tare, g	124.5
Moisture Content, %	35.8

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3669.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2701.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	[illegible]

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2!	S. Type	Bulk
Sample ID	10751/CB-98	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	358.5
Mass of Dry Sample & Tare, g	296.1
Mass of Tare, g	124.5
Moisture Content, %	36.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3953.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2899.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10752/CB-99	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	388.8
Mass of Dry Sample & Tare, g	318.3
Mass of Tare, g	125.0
Moisture Content, %	36.5

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3575.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2619.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10753/CB-100	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	422.6
Mass of Dry Sample & Tare, g	344.9
Mass of Tare, g	125.1
Moisture Content, %	35.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3844.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2840.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
		Checked By	[illegible]

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10754/CB-101	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	403.3
Mass of Dry Sample & Tare, g	329.8
Mass of Tare, g	124.1
Moisture Content, %	35.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3326.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2450.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10755/CB-102	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	420.5
Mass of Dry Sample & Tare, g	341.6
Mass of Tare, g	124.1
Moisture Content, %	36.3

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3619.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2655.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10756/CB-103	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	478.1
Mass of Dry Sample & Tare, g	389.8
Mass of Tare, g	140.4
Moisture Content, %	35.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3563.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2632.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	16

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10757/CB-104	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	411.4
Mass of Dry Sample & Tare, g	335.7
Mass of Tare, g	117.3
Moisture Content, %	34.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3776.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2804.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10758/CB-105	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	486.2
Mass of Dry Sample & Tare, g	400.6
Mass of Tare, g	159.1
Moisture Content, %	35.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3800.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2805.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10759/CB-106	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	449.7
Mass of Dry Sample & Tare, g	371.4
Mass of Tare, g	159.5
Moisture Content, %	37.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3185.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2325.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10760/CB-107	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	581.0
Mass of Dry Sample & Tare, g	466.7
Mass of Tare, g	156.2
Moisture Content, %	36.8

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3627.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2651.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10761/CB-108	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	667.9
Mass of Dry Sample & Tare, g	531.3
Mass of Tare, g	156.2
Moisture Content, %	36.4

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3275.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2400.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10762/CB-109	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	509.2
Mass of Dry Sample & Tare, g	417.8
Mass of Tare, g	155.0
Moisture Content, %	34.8

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3533.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2621.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10763/CB-110	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	579.6
Mass of Dry Sample & Tare, g	479.3
Mass of Tare, g	159.2
Moisture Content, %	31.3

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3718.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2831.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10764/CB-111	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	385.0
Mass of Dry Sample & Tare, g	294.3
Mass of Tare, g	16.1
Moisture Content, %	32.6

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3693.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2785.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10765/CB-112	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	469.8
Mass of Dry Sample & Tare, g	356.4
Mass of Tare, g	16.3
Moisture Content, %	33.3

REMARKS

REQUESTED SIEVE SIZE: 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3611.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2708.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10766/CB-113	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	346.6
Mass of Dry Sample & Tare, g	268.1
Mass of Tare, g	16.0
Moisture Content, %	31.1

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	4065.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	3100.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10767/CB-114	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	338.4
Mass of Dry Sample & Tare, g	251.8
Mass of Tare, g	16.3
Moisture Content, %	36.8

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3697.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2703.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

DESCRIPTION NA

USCS (ASTM D2487; D2488) NA

AASHTO (M 145) NA

Requested sieve ID #	31
Balance ID #	1/6/7/79
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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10768/CB-115	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	636.6
Mass of Dry Sample & Tare, g	547.3
Mass of Tare, g	300.9
Moisture Content, %	36.2

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3715.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2727.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10769/CB-116	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	662.1
Mass of Dry Sample & Tare, g	576.4
Mass of Tare, g	308.4
Moisture Content, %	32.0

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3834.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2905.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10770/CB-117	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	678.0
Mass of Dry Sample & Tare, g	573.8
Mass of Tare, g	299.8
Moisture Content, %	38.0

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3334.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2416.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10771/CB-118	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	687.2
Mass of Dry Sample & Tare, g	581.3
Mass of Tare, g	300.5
Moisture Content, %	37.7

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	4116.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2989.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0

Percent of material finer than requested sieve, % 100.0

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	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Single Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10772/CB-119	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	642.8
Mass of Dry Sample & Tare, g	551.8
Mass of Tare, g	305.4
Moisture Content, %	36.9

REMARKS

REQUESTED SIEVE SIZE 3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3642.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2660.3

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
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. #	1008-16-5
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10773/CB-120	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	665.2
Mass of Dry Sample & Tare, g	569.3
Mass of Tare, g	308.5
Moisture Content, %	36.8

REMARKS

REQUESTED SIEVE SIZE	3"

Entire sample was used for testing

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3536.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2585.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested sieve	0
Percent of material finer than requested sieve, %	100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10774/CB-121	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	345.7
Mass of Dry Sample & Tare, g	277.9
Mass of Tare, g	73.6
Moisture Content, %	33.2

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3819.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2867.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10775/CB-122	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	367.9
Mass of Dry Sample & Tare, g	299.7
Mass of Tare, g	89.3
Moisture Content, %	32.4

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3712.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2803.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10776/CB-123	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	361.0
Mass of Dry Sample & Tare, g	293.6
Mass of Tare, g	89.3
Moisture Content, %	33.0

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3695.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2778.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10777/CB-124	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	346.1
Mass of Dry Sample & Tare, g	283.8
Mass of Tare, g	95.7
Moisture Content, %	33.1

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3880.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2914.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
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ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10778/CB-125	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	384.8
Mass of Dry Sample & Tare, g	314.1
Mass of Tare, g	98.7
Moisture Content, %	32.8

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3001.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2259.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	[illegible]

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10779/CB-126	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	342.7
Mass of Dry Sample & Tare, g	276.8
Mass of Tare, g	90.2
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3590.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2653.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10780/CB-127	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	320.8
Mass of Dry Sample & Tare, g	262.0
Mass of Tare, g	93.8
Moisture Content, %	35.0

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3723.5
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2759.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10781/CB-128	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	299.4
Mass of Dry Sample & Tare, g	249.0
Mass of Tare, g	104.2
Moisture Content, %	34.8

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3309.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2454.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10782/CB-129	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	314.7
Mass of Dry Sample & Tare, g	256.4
Mass of Tare, g	90.8
Moisture Content, %	35.2

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3195.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2363.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10783/CB-130	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	360.6
Mass of Dry Sample & Tare, g	294.3
Mass of Tare, g	95.0
Moisture Content, %	33.3

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3677.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2759.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10784/CB-131	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	375.3
Mass of Dry Sample & Tare, g	304.6
Mass of Tare, g	95.4
Moisture Content, %	33.8

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3260.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2437.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10785/CB-132	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	387.2
Mass of Dry Sample & Tare, g	316.7
Mass of Tare, g	108.4
Moisture Content, %	33.9

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3298.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2464.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10786/CB-133	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	359.6
Mass of Dry Sample & Tare, g	299.5
Mass of Tare, g	108.3
Moisture Content, %	31.4

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3598.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2738.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10787/CB-134	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	334.7
Mass of Dry Sample & Tare, g	274.5
Mass of Tare, g	100.5
Moisture Content, %	34.6

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3357.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2494.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10788/CB-135	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	335.5
Mass of Dry Sample & Tare, g	273.3
Mass of Tare, g	89.2
Moisture Content, %	33.8

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3601.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2691.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10789/CB-136	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	372.6
Mass of Dry Sample & Tare, g	298.6
Mass of Tare, g	91.0
Moisture Content, %	35.6

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3409.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2513.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10790/CB-137	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	343.3
Mass of Dry Sample & Tare, g	281.4
Mass of Tare, g	102.5
Moisture Content, %	34.6

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3545.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2634.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10791/CB-138	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	371.1
Mass of Dry Sample & Tare, g	302.0
Mass of Tare, g	101.9
Moisture Content, %	34.5

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3729.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2772.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10792/CB-139	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	390.5
Mass of Dry Sample & Tare, g	319.1
Mass of Tare, g	112.6
Moisture Content, %	34.6

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3863.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2870.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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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ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10793/CB-140	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	342.7
Mass of Dry Sample & Tare, g	277.2
Mass of Tare, g	90.6
Moisture Content, %	35.1

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3956.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2928.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10794/CB-141	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	369.4
Mass of Dry Sample & Tare, g	295.3
Mass of Tare, g	85.3
Moisture Content, %	35.3

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3898.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2881.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10795/CB-142	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	353.9
Mass of Dry Sample & Tare, g	288.4
Mass of Tare, g	101.8
Moisture Content, %	35.1

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3692.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2732.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10796/CB-143	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	310.4
Mass of Dry Sample & Tare, g	253.2
Mass of Tare, g	94.0
Moisture Content, %	35.9

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3439.8
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2530.6

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	11/29/10
		Checked By	

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10797/CB-144	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	324.4
Mass of Dry Sample & Tare, g	272.0
Mass of Tare, g	90.3
Moisture Content, %	28.8

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3641.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2826.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

Tested By	KI/RI/DG
Date	11/29/10
Checked By	LB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10798/CB-145	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	315.5
Mass of Dry Sample & Tare, g	260.4
Mass of Tare, g	93.2
Moisture Content, %	33.0

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3137.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2359.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	11/29/10
		Checked By	

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10799/CB-146	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	335.7
Mass of Dry Sample & Tare, g	277.1
Mass of Tare, g	94.3
Moisture Content, %	32.1

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3299.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2498.8

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10800/CB-147	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	332.2
Mass of Dry Sample & Tare, g	274.4
Mass of Tare, g	91.3
Moisture Content, %	31.6

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3520.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2675.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, %	100.0

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

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AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10801/CB-148	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	284.1
Mass of Dry Sample & Tare, g	245.0
Mass of Tare, g	95.2
Moisture Content, %	26.1

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3433.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2722.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10802/CB-149	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	286.7
Mass of Dry Sample & Tare, g	249.0
Mass of Tare, g	98.7
Moisture Content, %	25.1

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3421.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2735.2

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, %	100.0

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

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10803/CB-150	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	436.2
Mass of Dry Sample & Tare, g	366.4
Mass of Tare, g	83.8
Moisture Content, %	24.7

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3409.1
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2733.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10804/CB-151	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	391.2
Mass of Dry Sample & Tare, g	340.7
Mass of Tare, g	140.6
Moisture Content, %	25.2

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3251.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2596.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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

AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10805/CB-152	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	336.6
Mass of Dry Sample & Tare, g	280.0
Mass of Tare, g	107.4
Moisture Content, %	32.8

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3106.6
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2339.4

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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

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Web: www.test-llc.com

AAP AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10806/CB-153	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	364.0
Mass of Dry Sample & Tare, g	297.2
Mass of Tare, g	95.0
Moisture Content, %	33.0

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3148.9
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2366.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10807/CB-154	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	403.3
Mass of Dry Sample & Tare, g	327.6
Mass of Tare, g	97.0
Moisture Content, %	32.8

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3709.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2792.5

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10808/CB-155	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	315.3
Mass of Dry Sample & Tare, g	261.1
Mass of Tare, g	98.5
Moisture Content, %	33.3

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3373.2
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2529.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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

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AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10809/CB-156	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	293.2
Mass of Dry Sample & Tare, g	245.2
Mass of Tare, g	100.0
Moisture Content, %	33.1

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3450.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2593.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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	KI/RI/DG
		Date	11/29/10
		Checked By	KB

ASTM C 136/D 6913 (D 422 old version)

Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10810/CB-157	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	334.9
Mass of Dry Sample & Tare, g	276.3
Mass of Tare, g	97.1
Moisture Content, %	32.7

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3583.0
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2700.1

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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

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Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10811/CB-158	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	280.9
Mass of Dry Sample & Tare, g	234.5
Mass of Tare, g	92.6
Moisture Content, %	32.7

REMARKS

REQUESTED SIEVE SIZE	3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3050.3
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2298.7

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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

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Fax: 770-923-8973
Web: www.test-llc.com

AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	KB

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10812/CB-159	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	380.4
Mass of Dry Sample & Tare, g	314.4
Mass of Tare, g	106.0
Moisture Content, %	31.7

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3208.7
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2436.9

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0
Percent of material finer than requested 1" sieve, %	100.0

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

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Web: www.test-llc.com

AASHTO R18

Tested By	KI/RI/DG
Date	11/29/10
Checked By	

ASTM C 136/D 6913 (D 422 old version)
Standard Test Method for Particle Size Analysis (Double Requested Sieve Size)

Client Pr. #	-	Lab. PR. #	1008-16-6
Pr. Name	CMS Landfill Cell 2I	S. Type	Bulk
Sample ID	10813/CB-160	Depth/Elev.	-
Location	-	Add. Info	-

AS-RECEIVED MOISTURE CONTENT

Mass of Wet Sample & Tare, g	343.9
Mass of Dry Sample & Tare, g	282.4
Mass of Tare, g	93.0
Moisture Content, %	32.5

REMARKS

REQUESTED SIEVE SIZE 3" & 1"

100% of Entire sample passed 3" Sieve

SIEVE ANALYSIS

Mass of wet sample used for sieve analysis & tare, g	3167.4
Mass of tare, g	0.0
Mass of dry sample used for sieve analysis, g	2391.0

Mass of Tare, g	0.0
Mass of sample retained on requested sieve and tare, g	0.0
Percent of sample retained on requested 1" sieve	0

Percent of material finer than requested 1" sieve, % 100.0

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

of NORTH CAROLINA, PLLC

SECTION G-4

Field Density Test Results

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-1	11/18	N 583650	L-1	N	88.4	37.9	PC-2	88.7	32.4	99.7	+5.5	P	
		E 1505350											
CL-2		N 3670			86.9	37.3				98.0	+4.9	P	
		E 5470											
CL-3		N 3740			93.4	31.9	PC-3	94.4	27.3	98.9	+4.6	P	
		E 5540											
CL-4		N 3720			93.1	31.1				98.6	+3.8	P	
		E 5670											
CL-5		N 3740			92.7	30.8				98.2	+3.5	P	
		E 5760											
CL-6		N 3740			87.7	35.4	PC-2	88.7	32.4	98.9	+3.0	P	
		E 5860											
CL-7		N 3770			87.0	35.9				98.1	+3.5	P	
		E 5970											
CL-8		N 583770			87.0	37.7				98.1	+5.3	P	
		E 1506080											
CL-9		N 3760			92.6	31.4	PC-3	94.4	27.3	98.1	+4.1	P	
		E 6150											
CL-10		N 3750			87.2	35.7	PC-2	88.7	32.4	98.3	+3.3	P	
		E 5350											
CL-11		N 3780			87.8	36.4				98.9	+4.0	P	
		E 5450											
CL-12		N 3820			88.1	36.9				99.3	+4.5	P	
		E 5520											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-13	11/18	N 583820	L-1	N	87.1	35.6	PC-2	88.7	32.4	98.2	+3.2	P	
		E 1505620											
CL-14		N 3830			87.7	36.2				98.9	+3.8	P	
		E 5750											
CL-15		N 3840			87.5	35.5				98.6	+3.1	P	
		E 5850											
CL-16		N 3870			87.4	35.4				98.5	+3.0	P	
		E 5970											
CL-17		N 3840			88.4	36.8				99.7	+4.4	P	
		E 6040											
CL-18		N 3850			87.9	35.9				99.1	+3.5	P	
		E 6130											
CL-19		N 3540			87.5	35.5				98.6	+3.1	P	
		E 5340											
CL-20		N 3560			87.5	35.4				98.6	+3.0	P	
		E 5450											
CL-21		N 3620			87.4	35.6				98.5	+3.2	P	
		E 5560											
CL-22		N 3620			93.6	30.3	PC-3	94.4	27.3	99.2	+3.0	P	
		E 5660											
CL-23		N 3640			87.7	35.6	PC-2	88.7	32.4	98.9	+3.2	P	
		E 5780											
CL-24		N 3640			88.2	35.5				99.4	+3.1	P	
		E 5830											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-25	11/18	N 583670	L-1	N	87.3	35.4	PC-2	88.7	32.4	98.4	+3.0	P	
		E 1505940											
CL-26		N 3650			84.1	39.3	PC-7	85.2	35.5	98.7	+3.8	P	
		E 6050											
CL-27		N 3580			87.7	37.0	PC-2	88.7	32.4	98.9	+4.6	P	
		E 6020											
CL-28		N 3530			87.8	37.4				98.9	+5.0	P	
		E 5520											
CL-29		N 3550			87.3	37.5				98.4	+5.1	P	
		E 5620											
CL-30		N 3580			87.7	35.4				98.4	+3.0	P	
		E 5730											
CL-31		N 3560			87.9	35.5				99.1	+3.1	P	
		E 5820											
CL-32		N 3530			88.2	35.9				99.4	+3.5	P	
		E 5930											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

COMPLETED BY: RTH / TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-33	11/19	N 583470	L-1	N	87.1	36.5	PC-2	88.7	32.4	98.2	+4.1	P	
		E 1505340											
CL-34		N 3460			87.9	35.8				99.1	+3.4	P	
		E 5460											
CL-35		N 3680			87.7	36.1				98.9	+3.7	P	
		E 6160											
CL-36		N 3570			88.2	36.5				99.4	+4.1	P	
		E 6150											
CL-37		N 3340			87.6	35.7				98.8	+3.3	P	
		E 5340											
CL-38		N 3240			83.4	39.6	PC-6	84.8	34.8	98.3	+4.8	P	
		E 5340											
CL-39		N 3370			87.5	36.5	PC-2	88.7	32.4	98.6	+4.1	P	
		E 5430											
CL-40		N 3260			87.6	35.9				98.8	+3.5	P	
		E 5430											
CL-41		N 3420			87.6	35.4				98.8	+3.0	P	
		E 5550											
CL-42		N 3430			93.3	30.3	PC-3	94.4	27.3	98.8	+3.0	P	
		E 5660											
CL-43		N 3550			85.0	39.6	PC-7	85.2	35.5	99.8	+4.1	P	
		E 5770											
CL-44		N 3430			83.1	39.4	PC-6	84.8	34.8	98.0	+4.6	P	
		E 5830											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-45	11/19	N 583450	L-1	N	87.3	35.5	PC-2	88.7	32.4	98.4	+3.1	P	
		E 1505950											
CL-46		N 3450			87.8	36.4				99.0	+4.0	P	
		E 6040											
CL-47		N 3460			88.0	36.8				99.2	+4.4	P	
		E 6140											
CL-48		N 3340			84.8	39.0	PC-6	84.8	34.8	100.0	+4.2	P	
		E 5540											
CL-49		N 3340			87.1	35.8	PC-2	88.7	32.4	98.2	+3.4	P	
		E 5650											
CL-50		N 3360			85.5	37.5	PC-5	85.5	32.2	100.0	+3.5	P	
		E 5750											
CL-51		N 3330			87.8	36.4	PC-2	88.7	32.4	99.0	+4.0	P	
		E 5840											
CL-52		N 3370			87.8	36.8				99.0	+4.4	P	
		E 5940											
CL-53		N 3350			87.9	36.0				99.1	+3.6	P	
		E 6050											
CL-54		N 3380			87.3	35.9				98.4	+3.5	P	
		E 6130											
CL-55		N 3740			87.2	36.2				98.3	+3.8	P	
		E 5250											
CL-56		N 3640			87.9	36.7				99.1	+4.3	P	
		E 5230											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-57	11/19	N 583540	L-1	N	85.4	37.8	PC-5	85.5	32.2	99.9	+5.6	P	
		E 1505270											
CL-58		N 3440			87.5	35.9	PC-2	88.7	32.4	98.6	+3.5	P	
		E 5240											
CL-59		N 3750			83.2	39.3	PC-6	84.8	34.8	98.1	+4.5	P	
		E 5140											
CL-60		N 3640			87.4	35.8	PC-2	88.7	32.4	98.5	+3.4	P	
		E 5130											
CL-61		N 3270			87.5	38.1				98.6	+5.7	P	
		E 5530											
CL-62		N 3290			87.4	36.7				98.5	+4.3	P	
		E 5710											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-63	11/20	N 583560	L-1	N	84.0	38.5	PC-6	84.8	34.8	99.1	+3.7	P	
		E 1505130											
CL-64		N 3360			87.5	35.9	PC-2	88.7	32.4	98.6	+3.5	P	
		E 5230											
CL-65		N 3270			88.1	36.5				99.3	+4.1	P	
		E 5270											
CL-66		N 3260			87.4	36.0				98.5	+3.6	P	
		E 5130											
CL-67		N 3340			87.1	36.1				98.2	+3.7	P	
		E 5150											
CL-68		N 3480			83.2	39.9	PC-6	84.8	34.8	98.1	+5.1	P	
		E 5130											
CL-69		N 3170			84.5	39.2	PC-2	88.7	32.4	99.6	+4.4	P	
		E 4970											
CL-70		N 3190			87.6	36.4				98.8	+4.0	P	
		E 5080											
CL-71		N 3270			87.8	37.0				99.0	+4.6	P	
		E 5060											
CL-72		N 3380			87.4	36.2				98.5	+3.8	P	
		E 5070											
CL-73		N 3750	L-2		83.3	38.7	PC-6	84.8	34.8	98.2	+3.9	P	
		E 5330											
CL-74		N 3750			85.0	30.2	PC-7	85.2	35.5	99.8	+4.7	P	
		E 5460											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

COMPLETED BY: RTH/TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-75	11/20	N 583750	L-2	N	83.9	39.4	PC-6	84.8	34.8	98.9	+4.6	P	
		E 1505550											
CL-76		N 3820			84.3	38.5				99.4	+3.7	P	
		E 5630											
CL-77		N 3830			84.1	40.0				99.2	+5.2	P	
		E 5750											
CL-78		N 3850			84.4	37.8				99.5	+3.0	P	
		E 5860											
CL-79		N 3830			87.5	37.0	PC-2	88.7	32.4	98.6	+4.6	P	
		E 5930											
CL-80		N 3850			87.0	36.2				98.1	+3.8	P	
		E 5640											
CL-81		N 3880			87.9	37.2				99.1	+4.8	P	
		E 6140											
CL-82		N 3640			87.5	35.5				98.6	+3.1	P	
		E 5360											
CL-83		N 3670			87.3	36.2				98.4	+3.8	P	
		E 5460											
		N											
		E											
		N											
		E											
		N											
		E											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

COMPLETED BY: KTH / TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS

PROJECT LOCATION: Charlotte, NC

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-84	11/21	N 583760 E 1505660	L-2	N	87.4	36.5	PC-2	88.7	32.4	98.5	+ 4.1	P	
CL-85		N 3750 E 5740			88.2	36.9				99.4	+ 4.5	P	
CL-86		N 3760 E 5840			87.7	36.1				98.9	+ 3.7	P	
CL-87		N 3740 E 5960			83.5	41.4	PC-6	84.8	34.8	98.5	+ 6.6	P	
CL-88		N 3760 E 6050			87.1	35.4	PC-2	88.7	32.4	98.2	+ 3.0	P	
CL-89		N 3770 E 6140			87.5	38.9				98.6	+ 6.5	P	
CL-90		N 3810 E 5510			87.3	35.7				98.4	+ 3.3	P	
CL-91		N 3640 E 5350			84.3	39.8	PC-6	84.8	34.8	99.4	+5.0	P	
CL-92		N 3570 E 5450			83.9	38.4				98.9	+3.6	P	
CL-93		N 3620 E 5550			83.9	38.2				98.9	+3.4	P	
CL-94		N 3620 E 5660			84.6	38.7				99.8	+3.9	P	
CL-95		N 3650 E 5830			84.9	38.8	PC-7	85.2	35.5	99.6	+3.3	P	

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

COMPLETED BY: RTH/TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS

PROJECT LOCATION: Charlotte, NC

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-96	11/21	N 5836060 E 1505930	L-2	N	85.2	38.5	PC-7	85.2	35.5	100.0	+3.0	P	
CL-97		N 3660 E 6020			87.3	36.4	PC-2	88.7	32.4	98.4	+4.0	P	
CL-98		N 3670 E 6140			84.0	39.7	PC-6	84.8	34.8	99.1	+4.9	P	
CL-99		N 3680 E 5750			87.3	35.9	PC-2	88.7	32.4	98.4	+3.5	P	
CL-100		N 3460 E 5330			87.4	35.5				98.5	+3.1	P	
CL-101		N 3460 E 5440			87.7	36.3				98.9	+3.9	P	
CL-102		N 3540 E 5540			87.6	35.7				98.8	+3.3	P	
CL-103		N 3550 E 5650			87.2	36.5				98.3	+4.1	P	
CL-104		N 3560 E 5750			83.7	39.0	PC-6	84.8	34.8	98.7	+4.2	P	
CL-105		N 3550 E 5850			87.4	36.0	PC-2	88.7	32.4	98.5	+3.6	P	
CL-106		N 3560 E 5950			83.7	39.2	PC-6	84.8	34.8	98.7	+4.4	P	
CL-107		N 3550 E 6050			84.1	39.9				99.2	+5.1	P	

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

COMPLETED BY: TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS

PROJECT LOCATION: Charlotte, NC

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-108	11/21	N 583580 E 1506140	L-2	N	87.1	35.4	PC-2	88.7	32.4	98.2	+3.0	P	
CL-109		N 3350 E 5340			87.4	36.2				98.5	+3.8	P	
CL-110		N 3360 E 5450			87.8	36.5				98.9	+4.1	P	
CL-111		N 3410 E 5520			87.8	36.7				98.9	+4.3	P	
CL-112		N 3430 E 5620			87.1	35.4				98.2	+3.0	P	
CL-113		N 3450 E 5730			84.3	39.2	PC-6	84.8	34.8	99.4	+4.4	P	
CL-114		N 3460 E 5820			87.6	35.7	PC-2	88.7	32.4	98.8	+3.3	P	
CL-115		N 3450 E 5920			87.9	36.0				99.1	+3.6	P	
CL-116		N 3440 E 6040			87.7	36.9				98.9	+4.5	P	
CL-117		N 3460 E 6150			87.1	36.7				98.2	+4.3	P	
CL-118		N 3270 E 5320			87.4	37.6				98.5	+5.2	P	
CL-119		N 3260 E 5450			83.7	39.1	PC-6	84.8	34.8	98.7	+4.3	P	

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

COMPLETED BY: RTH/TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

PROJECT NUMBER: I001154

PROJECT TITLE: CMS

PROJECT LOCATION: Charlotte, NC

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-120	11/21	N 583350 E 1505530	L-2	N	87.9	36.2	PC-2	88.7	32.4	99.1	+3.8	P	
CL-121		N 3320 E 5620			84.0	38.8	PC-6	84.8	34.8	99.1	+4.0	P	
CL-122		N 3350 E 5730			83.2	39.9				98.1	+5.1	P	
CL-123		N 3360 E 5830			87.8	36.1	PC-2	88.7	32.4	98.9	+3.7	P	
CL-124		N 3360 E 5940			87.8	37.1				98.9	+4.7	P	
CL-125		N 3360 E 6040			87.9	36.7				99.1	+4.3	P	
CL-126		N 3360 E 6140			87.4	35.6				98.5	+3.2	P	
CL-127		N 3260 E 5590			87.6	36.2				98.8	+3.8	P	
CL-128		N 3270 E 5690			87.7	35.4				98.9	+3.0	P	
CL-129		N 3750 E 5250			83.8	38.5	PC-6	84.8	34.8	98.8	+3.7	P	
CL-130		N 3650 E 5250			87.9	35.6	PC-2	88.7	32.4	99.1	+3.2	P	
CL-131		N 3560 E 5250			88.2	35.9				99.4	+3.5	P	

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH / TAT

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-132	11/21	N 583460	L-2	N	87.6	36.0	PC-2	88.7	32.4	98.8	+3.6	P	
		E 1505240											
CL-133		N 3750			87.6	35.7				98.8	+3.3	P	
		E 5140											
CL-134		N 3650			87.9	36.3				99.1	+3.9	P	
		E 5130											
CL-135		N 3330			87.8	36.1				98.9	+3.7	P	
		E 5120											
CL-136		N 3450			88.2	35.9				99.4	+3.5	P	
		E 5150											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
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		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH / TS

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/60

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-137	11/22	N 583350	L-2	N	87.5	36.6	PC-2	88.7	32.4	98.6	+4.2	P	
		E 1505150											
CL-138		N 3340			87.8	36.4				98.9	+4.0	P	
		E 5250											
CL-139		N 3240			87.2	37.9				98.3	+5.5	P	
		E 5150											
CL-140		N 3240			87.5	35.5				98.6	+3.1	P	
		E 5250											
CL-141		N 3180			83.8	39.1	PC-6	84.8	34.8	98.8	+4.3	P	
		E 5040											
CL-142		N 3270			83.4	40.1				98.3	+5.3	P	
		E 5030											
CL-143		N 3360			83.7	39.4				98.7	+4.6	P	
		E 5050											
CL-144		N 3170			83.7	39.1				98.7	+4.3	P	
		E 4920											
CL-145		N 3750	L-3		83.4	38.8				98.3	+4.0	P	
		E 5330											
CL-146		N 3760			83.6	38.0				98.6	+3.2	P	
		E 5450											
CL-147		N 3810			83.1	40.3				98.0	+5.5	P	
		E 5580											
CL-148		N 3820			83.1	40.6				98.0	+5.8	P	
		E 5680											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2l

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TS

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-149	11/22	N 583830	L-3	N	88.3	36.1	PC-2	88.7	32.4	99.5	+3.7	P	
		E 1505750											
CL-150		N 3840			87.6	37.1				98.8	+4.7	P	
		E 5850											
CL-151		N 3850			85.3	37.9	PC-5	85.5	32.2	99.8	+5.7	P	
		E 5950											
CL-152		N 3850			87.9	35.5	PC-2	88.7	32.4	99.1	+3.1	P	
		E 6050											
CL-153		N 3850			85.3	36.4	PC-5	85.5	32.2	99.8	+4.2	P	
		E 6140											
CL-154		N 3660			87.3	36.3	PC-2	88.7	32.4	98.4	+3.9	P	
		E 5335											
CL-155		N 3677			87.7	35.4				98.8	+3.0	P	
		E 5450											
CL-156		N 3715			87.7	36.3				98.9	+3.9	P	
		E 5570											
CL-157		N 3780			88.0	36.9				99.2	+4.5	P	
		E 5665											
CL-158		N 3740			87.1	36.7				98.2	+4.3	P	
		E 5745											
CL-159		N 3740			83.7	38.5	PC-6	84.8	34.8	98.7	+3.7	P	
		E 5845											
CL-160		N 3780			85.5	38.3	PC-5	85.5	32.2	100.0	+6.1	P	
		E 5985											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TS

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/60

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-161	11/22	N 583775	L-3	N	85.3	37.2	PC-5	85.5	32.2	99.7	+5.0	P	
		E 1506020											
CL-162		N 3770			84.6	38.1				99.0	+5.9	P	
		E 6135											
CL-163		N 3540			84.2	38.3				98.5	+6.1	P	
		E 5340											
CL-164		N 3565			87.4	36.8	PC-2	88.7	32.4	98.5	+4.4	P	
		E 5460											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-165	11/23	N 583625	L-3	N	87.4	36.1	PC-2	88.7	32.4	98.5	+3.7	P	
		E 1805535											
CL-166		N 3685			87.7	37.1				98.8	+4.7	P	
		E 5640											
CL-167		N 3640			87.3	36.7				98.5	+4.3	P	
		E 5740											
CL-168		N 3645			87.3	37.4				98.5	+5.0	P	
		E 5845											
CL-169		N 3660			84.1	39.3	PC-6	84.8	34.8	99.2	+4.5	P	
		E 5940											
CL-170		N 3665			83.9	40.1				98.9	+5.3	P	
		E 6035											
CL-171		N 3670			87.6	36.8	PC-2	88.7	32.4	98.8	+4.4	P	
		E 6120											
CL-172		N 3915	L-1		87.1	36.0				98.2	+3.6	P	
		E 6125											
CL-173		N 3670			87.4	35.9				98.5	+3.5	P	
		E 6220											
CL-174		N 3290			87.1	36.7				98.2	+4.3	P	
		E 5825											
CL-175		N 3180			87.2	35.5				98.3	+3.1	P	
		E 5155											
CL-176		N 3225			87.4	36.5				98.5	+4.1	P	
		E 4970											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2l

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-177	11/23	N 583450	L-1	N	87.3	36.6	PC-2	88.7	32.4	98.4	+4.2	P	
		E 1505070											
CL-178		N 3540			87.5	37.1				98.6	+4.7	P	
		E 5080											
CL-179		N 3470	L-3		88.1	37.9				99.3	+5.5	P	
		E 5350											
CL-180		N 3475			87.1	37.0				98.2	+4.6	P	
		E 5455											
CL-181		N 3565			87.6	36.8				98.8	+4.4	P	
		E 5540											
CL-182		N 3555			87.7	36.9				98.9	+4.5	P	
		E 5645											
CL-183		N 3580			84.8	39.2	PC-6	84.8	34.8	100.0	+4.4	P	
		E 5765											
CL-184		N 3580			84.5	39.1				99.6	+4.3	P	
		E 5850											
CL-185		N 3560			84.0	38.5				99.1	+3.7	P	
		E 5965											
CL-186		N 3550			84.2	38.4				99.4	+3.6	P	
		E 6045											
CL-187		N 3540			84.3	39.2				99.4	+4.4	P	
		E 6150											
CL-188		N 3655			87.0	36.7	PC-2	88.7	32.4	98.0	+4.3	P	
		E 6220											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-189	11/23/10	N 583920	L-2	N	87.9	37.0	PC-2	88.7	32.4	99.1	+4.6	P	
		E 1506125											
CL-190		N 3690			87.6	36.8				98.8	+4.4	P	
		E 6220											
CL-191		N 3290			87.8	36.5				98.9	+4.1	P	
		E 5880											
CL-192		N 3265			87.3	35.9				98.4	+3.5	P	
		E 5730											
CL-193		N 3186			87.1	36.0				98.2	+3.6	P	
		E 5185											
CL-194		N 3435			87.4	37.7				98.5	+5.3	P	
		E 5060											
CL-195		N 3535			87.5	37.3				98.6	+4.9	P	
		E 5080											
CL-196		N 3340			87.1	36.5				98.2	+4.1	P	
		E 5335											
CL-197		N 3365			87.5	35.5				98.6	+3.1	P	
		E 5455											
CL-198		N 3420			84.3	39.2	PC-6	84.8	34.8	99.5	+4.4	P	
		E 5560											
CL-199		N 3430			84.3	39.7				99.4	+4.9	P	
		E 5650											
CL-200		N 3445			84.1	38.6				99.1	+3.8	P	
		E 5730											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/6

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-201	11/23	N 583450	L-3	N	84.8	38.9	PC-6	84.8	34.8	100.0	+4.1	P	
		E 1505840											
CL-202		N 3460			84.2	38.5				99.3	+3.7	P	
		E 5920											
CL-203		N 3440			87.1	36.5	PC-2	88.7	32.4	98.2	+4.1	P	
		E 6020											
CL-204		N 3435			87.4	36.8				98.5	+4.4	P	
		E 6135											
CL-205		N 3350			87.5	38.2				98.6	+5.8	P	
		E 6130											
CL-206		N 3365			83.6	37.8	PC-6	84.8	34.8	98.6	+3.0	P	
		E 6020											
CL-207		N 3350			87.2	37.0	PC-2	88.7	32.4	98.3	+4.6	P	
		E 5945											
CL-208		N 3365			87.3	35.9				98.4	+3.5	P	
		E 5840											
CL-209		N 3280			87.2	36.2				98.3	+3.8	P	
		E 5825											
CL-210		N 3275			87.1	35.4				98.2	+3.0	P	
		E 5740											
CL-211		N 3360			83.8	39.4	PC-6	84.8	34.8	98.8	+4.6	P	
		E 5655											
CL-212		N 3360			87.1	36.1	PC-2	88.7	32.4	98.2	+3.7	P	
		E 5650											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-213	11/23	N 583270	L-3	N	87.0	36.4	PC-2	88.7	32.4	98.0	+4.0	P	
		E 1505640											
CL-214		N 3270			87.7	37.0				98.9	+4.6	P	
		E 5530											
CL-215		N 3270			87.9	36.3				99.1	+3.9	P	
		E 5530											
CL-216		N 3270			87.1	36.3				98.2	+3.9	P	
		E 5425											
CL-217		N 3250			87.3	36.9				98.4	+4.5	P	
		E 5350											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TS

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-218	11/24	N 583765	L-3	N	83.3	40.9	PC-6	84.8	34.8	98.3	+6.1	P	
		E 1505130											
CL-219		N 3640			84.0	39.8				99.1	+5.0	P	
		E 5245											
CL-220		N 3570			84.2	39.5				99.3	+4.7	P	
		E 5290											
CL-221		N 3460			83.4	40.0				98.3	+5.2	P	
		E 5290											
CL-222		N 3370			87.6	36.5	PC-2	88.7	32.4	98.8	+3.1	P	
		E 5220											
CL-223		N 3270			83.8	39.5	PC-6	84.8	34.8	98.8	+4.7	P	
		E 5235											
CL-224		N 3190			83.4	39.9				98.4	+5.1	P	
		E 5220											
CL-225		N 3175			84.5	39.1				99.6	+4.3	P	
		E 5125											
CL-226		N 3250			84.3	39.8				99.4	+5.0	P	
		E 5130											
CL-227		N 3340			87.6	36.5				98.8	+4.1	P	
		E 5140											
CL-228		N 3435			87.9	37.0				99.2	+4.6	P	
		E 5150											
CL-229		N 3540			87.4	36.8				98.5	+4.4	P	
		E 5150											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH/TS

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-230	11/24	N 583635	L-3	N	87.7	37.2	PC-2	88.7	32.4	98.9	+4.8	P	
		E 1505140											
CL-231		N 3760			87.3	36.7				98.4	+4.3	P	
		E 5130											
CL-232		N 3520			87.0	37.2				98.1	+4.8	P	
		E 5080											
CL-233		N 3410			87.8	37.0				99.0	+4.6	P	
		E 5050											
CL-234		N 3350			87.1	36.9				98.2	+4.5	P	
		E 5065											
CL-235		N 3250			87.2	36.0				98.3	+3.6	P	
		E 5035											
CL-236		N 3175			87.5	36.3				98.6	+3.9	P	
		E 5000											
CL-237		N 3185			87.5	35.8				98.6	+3.4	P	
		E 4915											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-238	11/27	N 583750	L-4	N	87.2	37.1	PC-2	88.7	32.4	98.3	+4.7	P	
		E 1505350											
CL-239		N 3760			87.7	37.0				98.9	+4.6	P	
		E 5450											
CL-240		N 3810			87.4	37.3				98.5	+4.9	P	
		E 5465											
CL-241		N 3815			87.3	36.5				98.4	+4.1	P	
		E 5560											
CL-242		N 3835			87.9	37.3				99.2	+4.9	P	
		E 5620											
CL-243		N 3840			87.4	35.9				98.5	+3.5	P	
		E 5735											
CL-244		N 3835			87.9	36.8				99.2	+4.4	P	
		E 5850											
CL-245		N 3850			87.4	35.5				98.5	+3.1	P	
		E 5935											
CL-246		N 3855			87.5	37.0				98.6	+4.6	P	
		E 6060											
CL-247		N 3840			87.0	36.9				98.1	+4.5	P	
		E 6145											
CL-248		N 3920			87.9	37.3				99.1	+4.9	P	
		E 6130											
CL-249		N 3765			87.7	36.3				98.9	+3.9	P	
	↓	E 6130	↓	↓			↓	↓	↓				

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-250	11/27	N 583760	L-4	N	87.1	35.9	PC-2	88.7	32.4	98.2	+3.5	P	
		E 1506030											
CL-251		N 3750			87.7	35.5				98.8	+3.1	P	
		E 5950											
CL-252		N 3760			87.1	36.7				98.2	+4.3	P	
		E 5840											
CL-253		N 3740			87.3	37.3				98.4	+4.9	P	
		E 5750											
CL-254		N 3750			87.3	35.6				98.4	+3.2	P	
		E 5645											
CL-255		N 3735			87.5	35.4				98.6	+3.0	P	
		E 5535											
CL-256		N 3670			88.0	36.7				99.2	+4.3	P	
		E 5435											
CL-257		N 3650			87.9	36.0				99.1	+3.6	P	
		E 5335											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-258	11/28	N 583560	L-4	N	88.1	36.8	PC-2	88.7	32.4	99.3	+4.4	P	
		E 1505335											
CL-259		N 3570			87.7	35.5				98.9	+3.1	P	
		E 5480											
CL-260		N 3630			87.9	36.3				99.2	+3.9	P	
		E 5560											
CL-261		N 3635			87.2	35.5				98.3	+3.1	P	
		E 5650											
CL-262		N 3650			87.6	35.9				98.8	+3.5	P	
		E 5750											
CL-263		N 3645			87.9	37.0				99.1	+4.6	P	
		E 5850											
CL-264		N 3675			88.2	36.9				99.4	+4.5	P	
		E 5950											
CL-265		N 3635			87.3	35.7				98.4	+3.3	P	
		E 6050											
CL-266		N 3480			87.5	35.5				98.6	+3.1	P	
		E 5380											
CL-267		N 3465			88.1	36.7				99.3	+4.3	P	
		E 5445											
CL-268		N 3535			87.7	35.4				98.9	+3.0	P	
		E 5550											
CL-269		N 3545			87.8	35.9				98.9	+3.5	P	
		E 5650											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/26

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-270	11/28	N 583550	L-4	N	87.6	35.6	PC-2	88.7	32.4	98.8	+3.2	P	
		E 1505750											
CL-271		N 3545			88.2	36.0				99.4	+3.6	P	
		E 5850											
CL-272		N 3565			88.2	36.8				99.4	+4.4	P	
		E 5945											
CL-273		N 3550			87.7	37.1				98.9	+4.7	P	
		E 6045											
CL-274		N 3545			87.5	36.4				98.6	+4.0	P	
		E 6145											
CL-275		N 3635			87.6	35.6				98.8	+3.2	P	
		E 6135											
CL-276		N 3650			88.0	36.9				99.2	+4.5	P	
		E 6235											
CL-277		N 3715			87.5	36.5				98.6	+3.2	P	
		E 6215											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/00

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-278	11/29	N 583350	L-4	N	83.9	39.4	PC-6	84.8	34.8	98.9	+4.6	P	
		E 1505350											
CL-279		N 3345			87.5	35.8	PC-2	88.7	32.4	98.6	+3.4	P	
		E 5430											
CL-280		N 3450			87.7	36.7				98.9	+4.3	P	
		E 5550											
CL-281		N 3455			87.3	35.9				98.4	+3.5	P	
		E 5650											
CL-282		N 3440			87.4	36.1				98.5	+3.7	P	
		E 5750											
CL-283		N 3445			87.8	37.0				98.9	+4.6	P	
		E 5855											
CL-284		N 3475			87.1	35.6				98.2	+3.2	P	
		E 5925											
CL-285		N 3450			87.2	36.7				98.3	+4.3	P	
		E 6045											
CL-286		N 3445			87.1	35.9				98.2	+3.5	P	
		E 6160											
CL-287		N 3335			87.3	36.1				98.4	+3.7	P	
		E 6135											
CL-288		N 3355			87.7	36.9				98.9	+4.5	P	
		E 6045											
CL-289		N 3325			87.9	36.8				99.1	+4.4	P	
		E 5930											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: ✓

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-290	11/29	N 583350	L-4	N	87.7	36.2	PC-2	88.7	32.4	98.9	+3.8	P	
		E 1505850											
CL-291		N 3345			87.8	36.1				98.9	+3.7	P	
		E 5745											
CL-292		N 3375			84.2	39.5	PC-6	84.8	34.8	99.2	+4.7	P	
		E 5650											
CL-293		N 3345			84.1	38.9				99.2	+4.1	P	
		E 5550											
CL-294		N 3250			84.6	38.5				99.8	+3.7	P	
		E 5445											
CL-295		N 3260			83.8	39.2				98.8	+4.4	P	
		E 5345											
CL-296		N 3270			84.8	37.4				100.0	+3.1	P	
		E 5540											
CL-297		N 3275			87.3	35.5	PC-2	88.7	32.4	98.4	+3.1	P	
		E 5650											
CL-298		N 3270			87.4	36.0				98.5	+3.6	P	
		E 5750											
CL-299		N 3280			87.2	36.4				98.3	+4.0	P	
		E 5830											
CL-300		N 3740			87.4	36.0				98.5	+3.6	P	
		E 5240											
CL-301		N 3640			87.4	35.4				98.5	+3.0	P	
		E 5245											

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SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-302	11/29	N 583535	L-4	N	87.7	36.9	PC-2	88.7	32.4	98.9	+4.5	P	
		E 1505230											
CL-303		N 3480			87.4	36.8				98.5	+4.4	P	
		E 5250											
CL-304		N 3345			88.2	37.1				99.4	+4.7	P	
		E 5265											
CL-305		N 3260			87.5	35.7				98.6	+3.3	P	
		E 5260											
CL-306		N 3180			87.8	37.0				98.9	+4.6	P	
		E 5235											
CL-307		N 3780			84.2	38.4	PC-6	84.8	34.8	99.3	+3.6	P	
		E 5150											
CL-308		N 3650			84.0	39.6				99.1	+4.8	P	
		E 5150											
CL-309		N 3535			83.8	39.1				98.8	+4.3	P	
		E 5135											
CL-310		N 3460			83.9	38.8				98.9	+4.0	P	
		E 5170											
CL-311		N 3345			87.3	36.5	PC-2	88.7	32.4	98.4	+4.1	P	
		E 5180											
CL-312		N 3250			87.7	35.4				98.9	+3.0	P	
		E 5145											
CL-313		N 3175			87.5	37.1				98.6	+4.7	P	
		E 5140											

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ATLANTIC COAST CONSULTING, INC

SUMMARY SHEET
IN - SITU DENSITY TEST RESULTS

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

COMPLETED BY: RTH

REVIEWED BY: [illegible]

DATE REVIEWED: 12/2/10

TEST NUMBER	TEST DATE	APPROX. LOCATION	LIFT OR ELEVATION	TEST METHOD	IN-SITU DRY DENSITY (pcf)	IN-SITU MOISTURE CONTENT (%)	REFERENCE CURVE NUMBER	REFERENCE MAX. DRY DENSITY (pcf)	REFERENCE OPTIMUM MOISTURE (%)	PERCENT COMPACTION	DIFFERENCE FROM OPT. MOISTURE (%)	PASS/ FAIL	REMARKS
CL-314	11/29	N 583515	L-4	N	87.1	36.0	PC-2	88.7	32.4	98.2	+3.6	P	
		E 1505065											
CL-315		N 3450			87.0	35.8				98.1	+3.4	P	
		E 5070											
CL-316		N 3350			87.4	36.8				98.5	+4.4	P	
		E 5055											
CL-317		N 3250			88.3	36.7				99.5	+4.3	P	
		E 5050											
CL-318		N 3175			87.2	35.6				98.3	+3.2	P	
		E 5050											
CL-319		N 3160			87.2	35.5				98.3	+3.1	P	
		E 4950											
CL-320		N 3235			87.3	36.2				98.4	+3.8	P	
		E 4965											
CL-321		N 3130			87.9	36.4				99.1	+4.0	P	
		E 4855											
		N											
		E											
		N											
		E											
		N											
		E											
		N											
		E											

N = NUCLEAR DENSITY GAUGE DC = DRIVE CYLINDER S = SAND CONE

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX H

Conformance Test Results

of NORTH CAROLINA, PLLC

SECTION H-1
Geomembrane

GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane(s)
Sample Identification 249337.09
TRI Log #: E2339-13-08

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	61	60	62	67	65	65	66	58	61	63	3	60 avg
											58	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	35	32	32	32	31	34	33	34	33	34	33	1	10 min
Asperity Height (mils) - Side B	28	30	31	31	32	31	27	27	27	27	29	2	10 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	2.84	2.79									2.82	0.04	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.25										0.25		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)													
MD Yield Strength (ppi)	140	154	147	153	146						148	6	126 min
TD Yield Strength (ppi)	157	173	163	159	165						163	6	126 min
MD Break Strength (ppi)	181	233	212	176	205						201	23	90 min
TD Break Strength (ppi)	168	173	160	193	158						170	14	90 min
MD Yield Elongation (%)	22	22	22	22	22						22	0	12 min
TD Yield Elongation (%)	16	16	16	18	18						17	1	12 min
MD Break Elongation (%)	473	476	489	459	495						478	14	100 min
TD Break Elongation (%)	481	488	458	574	428						486	55	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	56	62	60	61	57	58	58	58	57	56	58	2	42 min
TD Tear Strength (lbs)	55	53	52	52	50	51	54	55	51	52	52	2	42 min

MD Machine Direction TD Transverse Direction NA Not Available

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

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane(s)
Sample Identification : 249347.09
TRI Log #: E2339-13-08

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)	64	64	63	62	65	60	65	66	65	62	64	2	60 avg
											60	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.944	0.944	0.945								0.944	0.001	0.940 min
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.83	2.84									2.84	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 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	146	152	154	152						151	3	126 min
TD Yield Strength (ppi)	158	159	159	170	162						162	5	126 min
MD Break Strength (ppi)	236	190	216	198	179						204	22	90 min
TD Break Strength (ppi)	159	149	124	153	118						141	18	90 min
MD Yield Elongation (%)	25	23	23	23	22						23	1	12 min
TD Yield Elongation (%)	17	17	17	17	17						17	0	12 min
MD Break Elongation (%)	459	464	484	486	431						465	22	100 min
TD Break Elongation (%)	438	408	101	415	320						336	139	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane
Sample Identification: 249461.09
TRI Log #: E2339-14-10

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)	58	62	59	63	63	60	61	62	61	60	61	2	60 avg
											58	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	28	32	32	33	35	32	33	33	30	32	32	2	10 min
Asperity Height (mils) - Side B	28	25	27	29	29	30	27	28	27	28	28	1	10 min
Density (ASTM D 1505)													
Density (g/cm3)	0.945	0.945	0.945								0.945	0.000	.940 min
Carbon Black Content (ASTM D 1603 mod.)													
% Carbon Black	2.81	2.80									2.81	0.01	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.30										0.30		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen)													
MD Yield Strength (ppi)	136	147	140	141	141						141	4	126 min
TD Yield Strength (ppi)	147	146	159	153	153						152	5	126 min
MD Break Strength (ppi)	163	219	167	192	200						188	23	90 min
TD Break Strength (ppi)	163	158	189	171	166						169	12	90 min
MD Yield Elongation (%)	21	22	22	22	22						22	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						16	0	12 min
MD Break Elongation (%)	450	465	469	455	500						468	20	100 min
TD Break Elongation (%)	531	491	593	546	545						541	36	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	58	51	53	53	51	61	52	56	53	52	54	3	42 min
TD Tear Strength (lbs)	48	47	49	47	47	48	48	47	46	51	48	1	42 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane
Sample Identification: 249376.09
TRI Log #: E2339-14-10

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)	62	61	65	64	62	60	64	65	62	65	63	2	60 avg
											60	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	29	30	30	32	33	28	32	33	33	34	31	2	10 min
Asperity Height (mils) - Side B	30	27	32	26	27	29	28	26	29	25	28	2	10 min
Density (ASTM D 1505)													
Density (g/cm3)	0.945	0.945	0.945								0.945	0.000	.940 min
Carbon Black Content (ASTM D 1603 mod.)													
% Carbon Black	2.81	2.80									2.81	0.01	2.0-3.0%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 cat 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 in cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.24										0.24		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen)													
MD Yield Strength (ppi)	138	147	140	141	141						141	4	126 min
TD Yield Strength (ppi)	147	146	159	153	153						152	5	126 min
MD Break Strength (ppi)	163	219	167	192	200						188	23	90 min
TD Break Strength (ppi)	163	158	189	171	166						169	12	90 min
MD Yield Elongation (%)	21	22	22	22	22						22	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						16	0	12 min
MD Break Elongation (%)	450	465	469	455	500						468	20	100 min
TD Break Elongation (%)	531	491	593	546	545						541	36	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	62	56	56	59	59	59	62	60	55	57	58	3	42 min
TD Tear Strength (lbs)	50	55	52	50	51	51	52	54	48	50	51	2	42 min

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane(s)
Sample Identification 249586-09
TRI Log #: E2339-16-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	59	59	61	64	66	66	64	64	61	61	63	3	60 avg
											59	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	33	34	33	34	32	33	33	35	34	33	33	1	10 min
Asperity Height (mils) - Side B	25	27	32	31	32	28	27	31	30	32	30	3	10 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	2.28	2.30									2.29	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.26										0.26		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)													
MD Yield Strength (ppi)	152	151	163	169	155						158	8	126 min
TD Yield Strength (ppi)	160	171	170	184	166						170	9	126 min
MD Break Strength (ppi)	225	207	176	235	184						205	25	90 min
TD Break Strength (ppi)	161	184	168	171	174						172	8	90 min
MD Yield Elongation (%)	22	22	22	22	22						22	0	12 min
TD Yield Elongation (%)	16	15	16	15	16						16	1	12 min
MD Break Elongation (%)	478	476	394	455	459						452	34	100 min
TD Break Elongation (%)	461	515	449	468	498						478	27	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	53	55	57	55	61	53	56	56	59	53	56	3	42 min
TD Tear Strength (lbs)	49	51	52	53	50	48	50	55	52	49	51	2	42 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane(s)
Sample Identification : 249697-09
TRI Log #: E2339-16-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	63	61	61	61	63	62	63	62	63	63	62	1	60 avg
											61	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	33	33	32	35	33	33	35	36	35	34	34	1	10 min
Asperity Height (mils) - Side B	29	28	29	30	28	30	29	32	28	29	29	1	10 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	2.78	2.79									2.79	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.26										0.26		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)													
MD Yield Strength (ppi)	155	151	149	155	154						153	3	126 min
TD Yield Strength (ppi)	163	170	158	171	158						164	6	126 min
MD Break Strength (ppi)	224	227	190	240	181						212	25	90 min
TD Break Strength (ppi)	203	127	165	140	197						166	34	90 min
MD Yield Elongation (%)	22	22	22	22	22						22	0	12 min
TD Yield Elongation (%)	16	16	17	17	17						17	1	12 min
MD Break Elongation (%)	470	486	483	481	459						476	11	100 min
TD Break Elongation (%)	575	339	449	410	563						467	101	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	51	52	57	59	56	59	53	52	58	57	56	3	42 min
TD Tear Strength (lbs)	53	50	51	51	51	53	49	51	49	50	51	2	42 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane(s)
Sample Identification 249607-09
TRI Log #: E2339-16-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	60	58	63	63	63	64	65	64	62	61	62	2	60 avg
											58	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	32	36	34	30	32	35	34	30	32	35	33	2	10 min
Asperity Height (mils) - Side B	28	27	30	29	32	27	28	30	32	30	29	2	10 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	2.90	2.86									2.88	0.03	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.26										0.26		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)													
MD Yield Strength (ppi)	154	151	155	162	152						155	4	126 min
TD Yield Strength (ppi)	158	166	163	162	164						163	3	126 min
MD Break Strength (ppi)	217	208	173	230	196						205	22	90 min
TD Break Strength (ppi)	115	125	125	124	183						134	27	90 min
MD Yield Elongation (%)	22	22	21	23	23						22	1	12 min
TD Yield Elongation (%)	16	15	17	16	16						16	1	12 min
MD Break Elongation (%)	469	466	430	456	476						460	18	100 min
TD Break Elongation (%)	384	379	298	300	535						379	96	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	56	59	56	60	54	57	58	54	57	53	56	2	42 min
TD Tear Strength (lbs)	50	51	51	51	49	50	51	50	49	48	50	1	42 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane(s)
Sample Identification 249718-09
TRI Log #: E2339-16-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
Thickness (ASTM D 5994)													
Thickness (mils)	60	61	62	63	64	64	63	61	62	62	62	1	60 avg
											60	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	35	30	35	32	31	35	35	38	39	32	34	3	10 min
Asperity Height (mils) - Side B	30	32	31	31	27	29	29	30	31	28	30	2	10 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	2.73	2.70									2.72	0.02	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.24										0.24		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)													
MD Yield Strength (ppi)	147	159	163	162	155						157	6	126 min
TD Yield Strength (ppi)	194	175	189	192	185						187	8	126 min
MD Break Strength (ppi)	224	232	198	237	188						216	22	90 min
TD Break Strength (ppi)	190	179	192	201	154						183	18	90 min
MD Yield Elongation (%)	26	26	26	26	26						26	0	12 min
TD Yield Elongation (%)	15	18	16	16	16						16	1	12 min
MD Break Elongation (%)	508	455	461	454	505						477	27	100 min
TD Break Elongation (%)	505	509	519	558	419						502	51	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	57	60	52	57	57	59	53	57	59	56	57	2	42 min
TD Tear Strength (lbs)	50	53	50	53	50	50	50	49	49	50	50	1	42 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: Agru 60 mil Microspike HDPE Geomembrane
Sample Identification: 249576-09
TRI Log #: E2348-70-06

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)	67	61	59	63	62	72	60	63	63	62	63	4	60 avg
											59	<< min	54 min
Asperity Height (GRI GM 12)													
Asperity Height (mils) - Side A	30	29	32	33	29	31	32	30	33	28	31	2	10 min
Asperity Height (mils) - Side B	34	36	35	31	35	33	38	34	33	34	34	2	10 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	2.32	2.31									2.32	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 Cat 1, 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Melt Flow Index (ASTM D 1238, Method A, 190/2.16)													
Melt Flow Index (g/10 min)	0.25										0.25		
Tensile Properties (ASTM D 638/GRI GM 13, 2 ipm strain rate, Type IV specimen - HDPE)													
MD Yield Strength (ppi)	182	178	183	170	172						177	6	126 min
TD Yield Strength (ppi)	203	172	162	176	170						177	16	126 min
MD Break Strength (ppi)	166	218	156	117	122						166	41	90 min
TD Break Strength (ppi)	134	200	179	214	229						191	37	90 min
MD Yield Elongation (%)	26	35	25	30	28						29	4	12 min
TD Yield Elongation (%)	18	26	26	29	29						26	5	12 min
MD Break Elongation (%)	490	438	425	193	216						352	137	100 min
TD Break Elongation (%)	315	445	431	408	434						407	53	100 min
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	62	65	64	63	54	53	57	56	62	61	60	4	42 min
TD Tear Strength (lbs)	49	53	51	56	57	49	54	53	52	54	53	3	42 min

MD Machine Direction TD Transverse Direction NA Not Available

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of NORTH CAROLINA, PLLC

SECTION H-2

Geocomposite

GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510004
TRI Log #: E2334-98-06

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM F 904, mod.)													
A - MD Average Peel Strength (ppi)	1.9	1.7	2.5	1.3	3.9						2.3	1.0	
A - MD Average Peel Strength (g/in)	863	772	1135	590	1771						1026	460	150 min
B - MD Average Peel Strength (ppi)	2.7	1.8	3.7	2.3	6.9						3.5	2.0	
B - MD Average Peel Strength (g/in)	1226	817	1680	1044	3133						1580	924	150 min
Note: A and B represent a randomly assigned top and bottom of the sample													
Thickness (ASTM D 5199) — GEONET COMPONENT													
Thickness (mils)	327	326	333	361	355	352	348	333	351	347	343	12	
Thickness (inch)	0.33	0.33	0.33	0.36	0.35	0.35	0.35	0.33	0.35	0.35	0.34	0.01	0.25 min
Density (ASTM D 1505) — GEONET COMPONENT													
Density (g/cm3)	0.957	0.957	0.954								0.956	0.002	0.940 min
Mass/Unit Area (ASTM D 5261) — GEOTEXTILE COMPONENT - A													
5" diameter circle (grams)	4.42	3.78	3.79	3.53	3.66	3.27	3.98	3.70	4.13	3.91	3.82	0.32	
Mass/Unit Area (oz/sq yd)	10.28	8.79	8.82	8.21	8.51	7.61	9.26	8.61	9.61	9.09	8.88	0.74	8 min
Mass/Unit Area (ASTM D 5261) — GEOTEXTILE COMPONENT - B													
5" diameter circle (grams)	3.40	3.60	3.15	3.34	3.22	3.68	3.45	3.41	3.55	3.74	3.45	0.19	
Mass/Unit Area (oz/sq yd)	7.91	8.37	7.33	7.77	7.49	8.56	8.02	7.93	8.26	8.70	8.03	0.44	8 min

MD Machine Direction TD Transverse Direction

NOTE: Geotextile had to be debonded from the geonet prior to testing. The debonding procedure may have biased test results.

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510220
TRI Log #: E2334-98-06

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM F 904, mod.)													
A - MD Average Peel Strength (ppi)	2.2	1.7	3.9	2.5	1.8						2.4	0.9	
A - MD Average Peel Strength (g/in)	999	772	1771	1135	817						1099	403	150 min
B - MD Average Peel Strength (ppi)	4.6	1.0	7.7	1.8	1.0						3.2	2.9	
B - MD Average Peel Strength (g/in)	2088	454	3496	817	454						1452	1321	150 min
Note: A and B represent a randomly assigned top and bottom of the sample													
Thickness (ASTM D 5199)	GEONET COMPONENT												
Thickness (mils)	346	382	353	362	381	371	340	351	361	370	362	14	
Thickness (inch)	0.346	0.382	0.353	0.362	0.381	0.371	0.34	0.351	0.361	0.37	0.36	0.01	0.25 min
Density (ASTM D 1505)	GEONET COMPONENT												
Density (g/cm3)	0.959	0.959	0.959								0.959	0.000	0.940 min
Mass/Unit Area (ASTM D 5261)	GEOTEXTILE COMPONENT - A												
5" diameter circle (grams)	3.61	3.50	3.31	3.58	4.17	4.45	4.32	4.36	4.07	3.92	3.93	0.41	
Mass/Unit Area (oz/sq yd)	8.40	8.14	7.70	8.33	9.70	10.35	10.05	10.14	9.47	9.12	9.14	0.94	8 min
Mass/Unit Area (ASTM D 5261)	GEOTEXTILE COMPONENT - B												
5" diameter circle (grams)	3.92	3.95	3.80	3.67	3.56	3.75	3.44	3.49	3.32	3.77	3.67	0.21	
Mass/Unit Area (oz/sq yd)	9.12	9.19	8.84	8.54	8.28	8.72	8.00	8.12	7.72	8.77	8.53	0.49	8 min

MD Machine Direction TD Transverse Direction

NOTE: Geotextile had to be debonded from the geonet prior to testing. The debonding procedure may have biased test results.

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

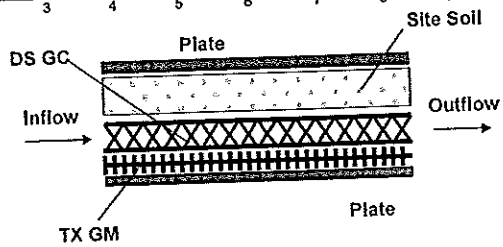
Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510037
TRI Log #: E2348-58-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate



PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen												
Volume (cc)		1305	1294	1297									
Time (s)		90.35	69.87	90.44									
Flow Rate (GPM/ft width)		0.23	0.23	0.23							0.23	0.00	
24 Transmissivity (m^2/s)		9.48E-04	9.45E-04	9.41E-04							9.45E-04	3.38E-06	$5x10^{-4}$ min
Test Temp (C)			20.0										
Temp. Corr. Factor			1.000										

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510039
TRI Log #: E2348-58-08

PARAMETER — TEST REPLICATE NUMBER 1 2 3 4 5 6 7 8 9 10

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

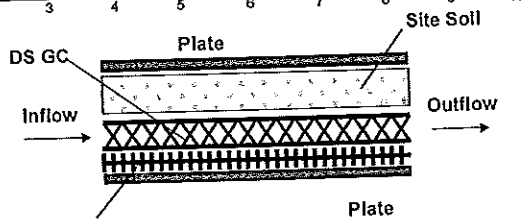

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)		Specimen			MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)	838	841	841			
	Time (s)	45.38	45.43	45.49			
	Flow Rate (GPM/ft width)	0.29	0.29	0.29	0.29	0.00	
24	Transmissivity (m^2/s)	1.21E-03	1.21E-03	1.21E-03	1.21E-03	1.50E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510093
TRI Log #: E2348-58-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

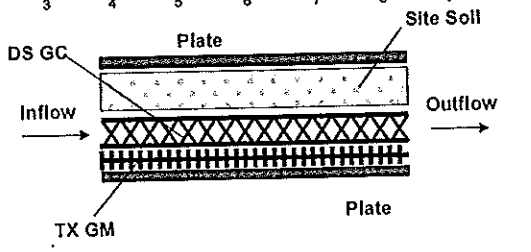

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen												
Volume (cc)		533	532	531									
Time (s)		30.04	30.03	30.00									
Flow Rate (GPM/ft width)		0.28	0.28	0.28							0.28	0.00	
24 Transmissivity (m^2/s)		1.16E-03	1.16E-03	1.16E-03							1.16E-03	1.43E-06	$5x10^{-4}$ min
Test Temp (C)			20.0										
Temp. Corr. Factor			1.000										

MD Machine Direction TD Transverse Direction

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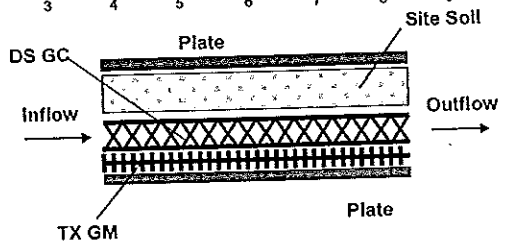
GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510118
TRI Log #: E2348-58-08

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):	15,000												
Hydraulic Gradient:	0.05												
Test Length (in)	12												
Test Width (in)	12												
Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate													
Seat Time (hours)	Specimen												
Volume (cc)			626	611	610								
Time (s)			60.30	60.30	60.40								
Flow Rate (GPM/ft width)			0.16	0.16	0.16						0.16	0.00	
24 Transmissivity (m^2/s)			6.81E-04	6.65E-04	6.63E-04						6.70E-04	1.01E-05	$5x10^{-4}$ min
Test Temp (C)				20.0									
Temp. Corr. Factor				1.000									



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: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510172
TRI Log #: E2348-58-09

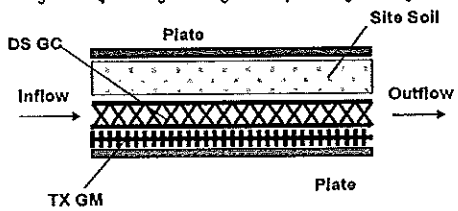
PARAMETER — TEST REPLICATE NUMBER 1 2 3 4 5 6 7 8 9 10 — MEAN — STD. DEV. — PROJ. SPEC.

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested. Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate



Seat Time (hours)	Specimen	1	2	3	MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)	529	522	526			
	Time (s)	60.40	60.21	60.32			
24	Flow Rate (GPM/ft width)	0.14	0.14	0.14	0.14	0.00	
	Transmissivity (m^2/s)	5.75E-04	5.69E-04	5.72E-04	5.72E-04	2.92E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510181
TRI Log #: E2348-58-09

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

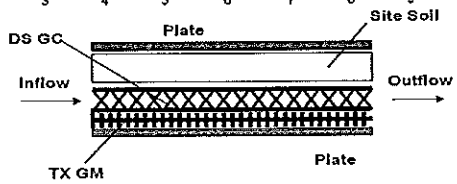

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1			Mean	Std. Dev.	Proj. Spec.
	Volume (cc)	751	749	741			
	Time (s)	90.29	90.30	90.30			
24	Flow Rate (GPM/ft width)	0.13	0.13	0.13	0.13	0.00	
	Transmissivity (m^2/s)	5.46E-04	5.44E-04	5.38E-04	5.43E-04	3.87E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510263
TRI Log #: E2348-58-09

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

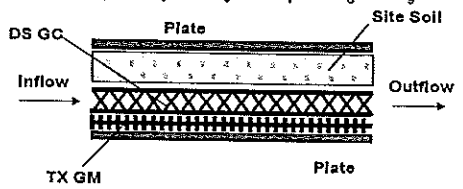

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1											
	Volume (cc)	703	711	709									
	Time (s)	45.00	45.13	45.07									
24	Flow Rate (GPM/ft width)	0.25	0.25	0.25							0.25	0.00	
	Transmissivity (m^2/s)	1.03E-03	1.03E-03	1.03E-03							1.03E-03	4.63E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0										
	Temp. Corr. Factor		1.000										

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510166
TRI Log #: E2348-58-08

RETEST

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

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

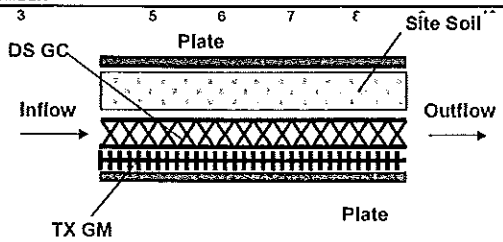

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1								
	Volume (cc)	529	526	527						
	Time (s)	60.41	60.33	60.36						
24	Flow Rate (GPM/ft width)	0.14	0.14	0.14				0.14	0.00	
	Transmissivity (m^2/s)	5.75E-04	5.72E-04	5.73E-04				5.73E-04	1.28E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0							
	Temp. Corr. Factor		1.000							

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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ACC of NORTH CAROLINA, PLLC

APPENDIX I

Manufacturer's Quality Control Certificates

of NORTH CAROLINA, PLLC

SECTION I-1

Geomembrane

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quality certificate

ROLL # **249337-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.54	mm	61	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 26/32 mil	AVE:	1.57	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 **178**

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
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	30 N/mm (kN/m)	170 ppi	2,749 psi
	Average Strength @ Break	33 N/mm (kN/m)	186 ppi	3,015 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.23
Lo = 2.0" Break	Average Elongation @ Break	%		453.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-2-09**

Signature: H Holmes
Quality Control Department

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ROLL # **249338-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.62	mm	64	mil
Asperity ASTM D7466: 27/32 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	178		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
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	30 N/mm (kN/m)	171 ppi	2,749 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,015 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.23
Lo = 2.0" Break	Average Elongation @ Break	%		453.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: [signature]
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ROLL # **249339-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH			
	MIN:	1.47 mm	58 mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.63 mm	64 mil	Length.....	125 m	410.1 feet
				Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 28/32 mil	AVE:	1.55 mm	61 mil	OIT(Standard) ASTM D3895 minutes	178	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
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 (kN/m)	168 ppi	2,749 psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi	3,015 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.23
Lo = 2.0" Break	Average Elongation @ Break	%		453.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: [signature]
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ROLL # **249340-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.54	mm	61	mil
	MAX:	1.61	mm	63	mil
	AVE:	1.58	mm	62	mil

Asperity ASTM D7466: 29/32 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 178

						TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc				.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26
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	30	N/mm (kN/m)	171	ppi	2,749 psi
	Average Strength @ Break	33	N/mm (kN/m)	188	ppi	3,015 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.23
Lo = 2.0" Break	Average Elongation @ Break	%				453.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2	N			52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6	N			101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6	N			138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: H Holmes
Quality Control Department

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ROLL # **249341-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.64	mm	65	mil
Asperity ASTM D7466: 29/33 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 **178**

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.82
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,618 psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi	3,059 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.04
Lo = 2.0" Break	Average Elongation @ Break	%		464.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: [signature]
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ROLL # **249342-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.60	mm	63	mil
	AVE:	1.54	mm	61	mil

Asperity ASTM D7466: 26/31 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 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
Carbon Black Content ASTM D4218	Range	%			2.82
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,618	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi	3,059	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.04	
	Average Elongation @ Break	%		464.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09
Signature: [signature]
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ROLL # **249343-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.66	mm	65	mil
Asperity ASTM D7466: 27/35 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.52
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi	2,618 psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	3,059 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.04
Lo = 2.0" Break	Average Elongation @ Break	%		464.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: [signature]
Quality Control Department

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ROLL # **249344-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.51	mm	59	mil
	MAX:	1.67	mm	66	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 ASTM D7466: 30/30 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.52
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi	2,618 psi
	Average Strength @ Break	33 N/mm (kN/m)	190 ppi	3,059 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.04
	Average Elongation @ Break	%		464.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: [signature]
Quality Control Department

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ROLL # **249345-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.68	mm	66	mil
Asperity ASTM D7466: 30/32 mil	AVE:	1.57	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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.52
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi	2,618 psi
	Average Strength @ Break	33 N/mm (kN/m)	189 ppi	3,059 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.04
Lo = 2.0" Break	Average Elongation @ Break	%		464.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.2 N		52.872 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	453.6 N		101.97 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.6 N		138.18 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-2-09**
Signature: H. Holmes
Quality Control Department

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ROLL # **249346-09** Lot #: 8291013 **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.50	mm	59	mil
	MAX:	1.61	mm	63	mil
	AVE:	1.55	mm	61	mil

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

Asperity ASTM D7466: 26/36 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
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	30 N/mm (kN/m)	169 ppi	2,770 psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi	3,178 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		17.85
	Average Elongation @ Break	%		478.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N		55.289 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N		90.132 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N		138.73 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: [signature]
Quality Control Department

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ROLL # **249347-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.69	mm	67	mil
Asperity ASTM D7466: 30/30 mil	AVE:	1.57	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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
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	30 N/mm (kN/m)	171 ppi	2,770 psi
	Average Strength @ Break	34 N/mm (kN/m)	196 ppi	3,178 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.85
Lo = 2.0" Break	Average Elongation @ Break	%		478.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N		55.289 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N		90.132 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N		138.73 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09
Signature: H. Holmes
Quality Control Department

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ROLL # **249448-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.67	mm	66	mil
	AVE:	1.56	mm	61	mil

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

Asperity ASTM D7466: 28/30 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
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	30 N/mm (kN/m)	170 ppi	2,770	psi
	Average Strength @ Break	34 N/mm (kN/m)	195 ppi	3,178	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.85	
Lo = 2.0" Break	Average Elongation @ Break	%		478.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N		55.289	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N		90.132	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N		138.73	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-2-09

Signature: St Holmes
Quality Control Department

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ROLL # **249449-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.54	mm	61	mil
	MAX:	1.68	mm	66	mil
Asperity ASTM D7466: 29/30 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.71
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	174 ppi	2,770 psi
	Average Strength @ Break	35 N/mm (kN/m)	200 ppi	3,178 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.85
Lo = 2.0" Break	Average Elongation @ Break	%		478.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N		55.289 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N		90.132 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N		138.73 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09
Signature: H Holmes
Quality Control Department

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ROLL # **249450-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.63	mm	64	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 ASTM D7466: 30/31 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

			TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc	.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min	.26
Carbon Black Content ASTM D4218	Range	%	2.71
Carbon Black Dispersion ASTM D5596	Category		10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m) 171 ppi	2,770 psi
	Average Strength @ Break	34 N/mm (kN/m) 196 ppi	3,178 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%	17.85
Lo = 2.0" Break	Average Elongation @ Break	%	478.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%	-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N	55.289 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N	90.132 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N	138.73 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: H Holmes
Quality Control Department

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ROLL # **249454-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH		
	MIN:	1.44 mm	57 mil	Thickness.....	1.5 mm 60 mil
	MAX:	1.59 mm	63 mil	Length.....	125 m 410.1 feet
				Width.....	7.00 m; 23.0 feet
Asperity ASTM D7466: 27/33 mil	AVE:	1.53 mm	60 mil	OIT(Standard) ASTM D3895 minutes	178

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.19
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi	2,578 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,123 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.73
Lo = 2.0" Break	Average Elongation @ Break	%		490.4
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N		55.289 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N		90.132 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N		138.73 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: [signature]
Quality Control Department

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ROLL # **249455-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.43	mm	56	mil
	MAX:	1.60	mm	63	mil
	AVE:	1.53	mm	60	mil

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

Asperity ASTM D7466: 29/32 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.19
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi	2,578 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,123 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.73
Lo = 2.0" Break	Average Elongation @ Break	%		490.4
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.9 N		55.289 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.9 N		90.132 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	617.1 N		138.73 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: [signature]
Quality Control Department

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ROLL # **249456-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.50	mm	59	mil
	MAX:	1.59	mm	63	mil
Asperity ASTM D7466: 26/32 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.16
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	153 ppi	2,523 psi
	Average Strength @ Break	33 N/mm (kN/m)	189 ppi	3,122 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	%		493.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9 N		50.780 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5 N		96.555 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4 N		125.99 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: [signature]
Quality Control Department

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ROLL # **249457-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 27/32 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.16
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	152 ppi	2,523 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,122 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		17.88
	Average Elongation @ Break	%		493.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9 N		50.780 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5 N		96.555 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4 N		125.99 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: H Holmes
Quality Control Department

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ROLL # **249458-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.46	mm	57	mil
	MAX:	1.57	mm	62	mil
Asperity ASTM D7466: 28/32 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.16
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	152 ppi	2,523 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,122 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	%		493.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9 N		50.780 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5 N		96.555 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4 N		125.99 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: [signature]
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ROLL # **249459-09** Lot #: 8291013 **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.43	mm	56	mil
	MAX:	1.62	mm	64	mil
	AVE:	1.53	mm	60	mil

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

Asperity ASTM D7466: 28/32 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.20
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	152 ppi	2,523 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,122 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		17.88
	Average Elongation @ Break	%		493.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9 N		50.780 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5 N		96.555 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4 N		125.99 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

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ROLL # **249460-09** Lot #: 8291013 **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.57 mm	62 mil
Asperity ASTM D7466: 27/31 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.20
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	152 ppi	2,523 psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,122 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	%		493.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9 N		50.780 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5 N		96.555 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4 N		125.99 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

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ROLL # **249461-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.58	mm	62	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 ASTM D7466: 29/32 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.67	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26	N/mm (kN/m)	150	ppi	2,477	psi
	Average Strength @ Break	28	N/mm (kN/m)	160	ppi	2,644	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.33	
Lo = 2.0" Break	Average Elongation @ Break	%				425.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9	N			50.780	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5	N			96.555	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4	N			125.99	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: H Holmes
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ROLL # **249462-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.59	mm	63	mil
Asperity ASTM D7466: 28/31 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 178

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.67	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26	N/mm (kN/m)	151 ppi	2,477	psi
	Average Strength @ Break	28	N/mm (kN/m)	161 ppi	2,644	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.33	
Lo = 2.0" Break	Average Elongation @ Break	%			425.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	225.9	N		50.780	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	429.5	N		96.555	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	560.4	N		125.99	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: H Holmes
Quality Control Department

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ROLL # **249467-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.64	mm	65	mil
Asperity ASTM D7466: 28/34 mil	AVE:	1.57	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 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
Carbon Black Content ASTM D4218	Range	%			2.66
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	165 ppi	2,662	psi
	Average Strength @ Break	31 N/mm (kN/m)	176 ppi	2,846	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.15	
Lo = 2.0" Break	Average Elongation @ Break	%		436.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-3-09

Signature: H. Holmes
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ROLL # **249568-09** Lot #: 8291013 **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 29/30 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.66
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi	2,662 psi
	Average Strength @ Break	31 N/mm (kN/m)	177 ppi	2,846 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.15
Lo = 2.0" Break	Average Elongation @ Break	%		436.5
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: [signature]
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ROLL # **249569-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.64	mm	65	mil
Asperity ASTM D7466: 27/34 mil	AVE:	1.56	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	178		

			TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc	.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min	.26
Carbon Black Content ASTM D4218	Range	%	2.66
Carbon Black Dispersion ASTM D5596	Category		10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m) 163 ppi	2,662 psi
	Average Strength @ Break	31 N/mm (kN/m) 175 ppi	2,846 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%	17.15
	Average Elongation @ Break	%	436.5
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%	-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N	52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N	92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N	138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
Quality Control Department

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ROLL # **249570-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.49	mm	59	mil
	MAX:	1.67	mm	66	mil
Asperity ASTM D7466: 28/29 mil	AVE:	1.56	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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.66
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi	2,662 psi
	Average Strength @ Break	31 N/mm (kN/m)	175 ppi	2,846 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.15
Lo = 2.0" Break	Average Elongation @ Break	%		436.5
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: [signature]
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ROLL # **249571-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.65	mm	65	mil
Asperity ASTM D7466: 29/30 mil	AVE:	1.57	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	178			

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.67
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	157 ppi	2,535 psi
	Average Strength @ Break	34 N/mm (kN/m)	195 ppi	3,158 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.28
Lo = 2.0" Break	Average Elongation @ Break	%		501.4
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-4-09**

Signature: H. Holmes
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ROLL # **249572-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.63	mm	64	mil
Asperity ASTM D7466: 29/29 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	178		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.67
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi	2,535 psi
	Average Strength @ Break	34 N/mm (kN/m)	193 ppi	3,158 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.28
Lo = 2.0" Break	Average Elongation @ Break	%		501.4
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
Quality Control Department

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ROLL # **249573-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.69	mm	67	mil
	AVE:	1.56	mm	61	mil

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

Asperity ASTM D7466: 29/29 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.67
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi	2,535 psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi	3,158 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.28
Lo = 2.0" Break	Average Elongation @ Break	%		501.4
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
Quality Control Department

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ROLL # **249574-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.62	mm	64	mil
	AVE:	1.58	mm	62	mil

Asperity ASTM D7466: 29/30 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 **178**

						TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc				.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26
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	28	N/mm (kN/m)	158 ppi		2,535 psi
	Average Strength @ Break	34	N/mm (kN/m)	196 ppi		3,158 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.28
Lo = 2.0" Break	Average Elongation @ Break	%				501.4
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5	N			52.502 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8	N			92.135 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3	N			138.11 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09
Signature: H. Holmes
Quality Control Department

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ROLL # **249575-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.64	mm	65	mil
	AVE:	1.58	mm	62	mil

Asperity ASTM D7466: 27/30 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 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
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	28 N/mm (kN/m)	158 ppi	2,535	psi
	Average Strength @ Break	34 N/mm (kN/m)	196 ppi	3,158	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.28	
Lo = 2.0" Break	Average Elongation @ Break	%		501.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	233.5 N		52.502	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	409.8 N		92.135	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.3 N		138.11	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H. Holmes
Quality Control Department

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ROLL # **249576-09** Lot #: 8291013 **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.54	mm	61	mil
	MAX:	1.68	mm	66	mil
Asperity ASTM D7466: 27/31 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.19
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	171 ppi	2,698 psi
	Average Strength @ Break	36 N/mm (kN/m)	204 ppi	3,213 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.98
Lo = 2.0" Break	Average Elongation @ Break	%		503.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

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ROLL # **249577-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.51	mm	59	mil
	MAX:	1.62	mm	64	mil
	AVE:	1.57	mm	62	mil

Asperity ASTM D7466: 29/30 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 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
Carbon Black Content ASTM D4218	Range	%			2.19
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi	2,698	psi
	Average Strength @ Break	35 N/mm (kN/m)	199 ppi	3,213	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.98
	Average Elongation @ Break	%			503.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
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ROLL # **249578-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.69	mm	67	mil
Asperity ASTM D7466: 27/30 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	178		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.19
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	170 ppi	2,698 psi
	Average Strength @ Break	35 N/mm (kN/m)	202 ppi	3,213 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.98
Lo = 2.0" Break	Average Elongation @ Break	%		503.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

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ROLL # **249579-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.45	mm	57	mil
	MAX:	1.66	mm	65	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 ASTM D7466: 27/31 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.17
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi	2,698 psi
	Average Strength @ Break	35 N/mm (kN/m)	199 ppi	3,213 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		17.98
	Average Elongation @ Break	%		503.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: [signature]
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ROLL # **249580-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.67	mm	66	mil
Asperity ASTM D7466: 27/32 mil	AVE:	1.57	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	178		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.17
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi	2,698 psi
	Average Strength @ Break	35 N/mm (kN/m)	199 ppi	3,213 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.98
Lo = 2.0" Break	Average Elongation @ Break	%		503.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes

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ROLL # **249581-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.67	mm	66	mil
	AVE:	1.58	mm	62	mil

Asperity ASTM D7466: 25/31 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 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
Carbon Black Content ASTM D4218	Range	%			2.20
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	37 N/mm (kN/m)	211 ppi	3,385	psi
	Average Strength @ Break	42 N/mm (kN/m)	238 ppi	3,833	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.81	
Lo = 2.0" Break	Average Elongation @ Break	%		491.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
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ROLL # **249582-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.62	mm	64	mil
Asperity ASTM D7466: 28/30 mil	AVE:	1.57	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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.20
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	37 N/mm (kN/m)	209 ppi	3,385 psi
	Average Strength @ Break	41 N/mm (kN/m)	237 ppi	3,833 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.81
Lo = 2.0" Break	Average Elongation @ Break	%		491.0
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
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ROLL # **249583-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.54	mm	61	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 28/30 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.20
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	37 N/mm (kN/m)	211 ppi	3,385 psi
	Average Strength @ Break	42 N/mm (kN/m)	238 ppi	3,833 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.81
Lo = 2.0" Break	Average Elongation @ Break	%		491.0
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: [signature]
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ROLL # **249584-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.56	mm	61	mil
	MAX:	1.63	mm	64	mil
Asperity ASTM D7466: 29/30 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	178		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.72
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	37 N/mm (kN/m)	211 ppi	3,385 psi
	Average Strength @ Break	42 N/mm (kN/m)	238 ppi	3,833 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.81
Lo = 2.0" Break	Average Elongation @ Break	%		491.0
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3 N		56.279 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2 N		98.289 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1 N		135.80 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Palmer
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ROLL # **249585-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.55	mm	61	mil
	MAX:	1.63	mm	64	mil
Asperity ASTM D7466: 30/31 mil ODD # : TOP EVEN #: BOTTOM	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

OIT(Standard) ASTM D3895 minutes 178

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.72	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	37	N/mm (kN/m)	212	ppi	3,385	psi
	Average Strength @ Break	42	N/mm (kN/m)	240	ppi	3,833	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.81	
Lo = 2.0" Break	Average Elongation @ Break	%				491.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.3	N			56.279	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.2	N			98.289	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.1	N			135.80	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes
Quality Control Department

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ROLL # **249586-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.69	mm	67	mil
Asperity ASTM D7466: 29/33 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 178

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.20	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	167	ppi	2,682	psi
	Average Strength @ Break	36	N/mm (kN/m)	208	ppi	3,337	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.34	
Lo = 2.0" Break	Average Elongation @ Break	%				516.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2	N			57.377	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0	N			95.106	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9	N			142.95	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: D. Holmes
Quality Control Department

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ROLL # **249587-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.67	mm	66	mil
Asperity ASTM D7466: 29/30 mil	AVE:	1.57	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	178		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.20	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi		2,682	psi
	Average Strength @ Break	36 N/mm (kN/m)	206 ppi		3,337	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.34	
Lo = 2.0" Break	Average Elongation @ Break	%			516.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N			57.377	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N			95.106	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N			142.95	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09
Signature: D. H. Holmes
Quality Control Department

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ROLL # **249688-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.69	mm	67	mil
Asperity ASTM D7466: 27/34 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.20
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi	2,682 psi
	Average Strength @ Break	37 N/mm (kN/m)	209 ppi	3,337 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.34
Lo = 2.0" Break	Average Elongation @ Break	%		516.9
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N		57.377 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N		95.106 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N		142.95 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-4-09

Signature: H Holmes

Quality Control Department

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ROLL # **249689-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.64	mm	65	mil
Asperity ASTM D7466: 27/35 mil	AVE:	1.57	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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND: E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.20
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi	2,682 psi
	Average Strength @ Break	36 N/mm (kN/m)	206 ppi	3,337 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.34
Lo = 2.0" Break	Average Elongation @ Break	%		516.9
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N		57.377 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N		95.106 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N		142.95 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Palmer
Quality Control Department

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ROLL # **249690-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.66	mm	65	mil
Asperity ASTM D7466: 29/29 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 178

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.20	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	168	ppi	2,682	psi
	Average Strength @ Break	37	N/mm (kN/m)	209	ppi	3,337	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.34	
Lo = 2.0" Break	Average Elongation @ Break	%				516.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2	N			57.377	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0	N			95.106	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9	N			142.95	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-5-09**

Signature: H. Holmes
Quality Control Department

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ROLL # **249691-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.52	mm	60	mil
	MAX:	1.66	mm	65	mil
Asperity ASTM D7466: 28/30 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 **178**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.20	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi		2,637	psi
	Average Strength @ Break	36 N/mm (kN/m)	206 ppi		3,320	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			14.43	
Lo = 2.0" Break	Average Elongation @ Break	%			500.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N			57.377	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N			95.106	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N			142.95	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Holmes
Quality Control Department

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ROLL # **249692-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.54	mm	61	mil
	MAX:	1.69	mm	67	mil
Asperity ASTM D7466: 30/30 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 178

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.26
Carbon Black Content ASTM D4218	Range	%			2.20
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	165 ppi	2,637	psi
	Average Strength @ Break	36 N/mm (kN/m)	208 ppi	3,320	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		14.43	
Lo = 2.0" Break	Average Elongation @ Break	%		500.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N		57.377	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N		95.106	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N		142.95	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09
Signature: H Holmes
Quality Control Department

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ROLL # **249693-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 28/32 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 178

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.86	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	161	ppi	2,637	psi
	Average Strength @ Break	35	N/mm (kN/m)	203	ppi	3,320	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				14.43	
Lo = 2.0" Break	Average Elongation @ Break	%				500.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2	N			57.377	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0	N			95.106	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9	N			142.95	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Holmes

Quality Control Department

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ROLL # **249694-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.58	mm	62	mil
	AVE:	1.55	mm	61	mil

Asperity ASTM D7466: 31/36 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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.86
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi	2,637 psi
	Average Strength @ Break	35 N/mm (kN/m)	203 ppi	3,320 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		14.43
Lo = 2.0" Break	Average Elongation @ Break	%		500.3
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N		57.377 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N		95.106 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N		142.95 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09
Signature: H Kolmer
Quality Control Department

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ROLL # **249695-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 30/33 mil	AVE:	1.56	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 178

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.26
Carbon Black Content ASTM D4218	Range	%		2.86
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi	2,637 psi
	Average Strength @ Break	36 N/mm (kN/m)	204 ppi	3,320 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		14.43
Lo = 2.0" Break	Average Elongation @ Break	%		500.3
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	255.2 N		57.377 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.0 N		95.106 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	635.9 N		142.95 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: [signature]
Quality Control Department

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ROLL # **249696-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.63	mm	64	mil
Asperity ASTM D7466: 31/34 mil	AVE:	1.57	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 178

						TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc				.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26
Carbon Black Content ASTM D4218	Range	%				2.63
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	159	ppi	2,568 psi
	Average Strength @ Break	30	N/mm (kN/m)	173	ppi	2,797 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.95
Lo = 2.0" Break	Average Elongation @ Break	%				331.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6	N			97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0	N			143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Holmes
Quality Control Department

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ROLL # **249697-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.67	mm	66	mil
Asperity ASTM D7466: 29/30 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	178		

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.63	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160	ppi	2,568	psi
	Average Strength @ Break	30	N/mm (kN/m)	174	ppi	2,797	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.95	
Lo = 2.0" Break	Average Elongation @ Break	%				331.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.56	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.508	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6	N			97.933	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0	N			143.66	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Holmes
Quality Control Department

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ROLL # **249698-09** Lot #: **8291013** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.55	mm	61	mil
	MAX:	1.68	mm	66	mil
Asperity ASTM D7466: 29/33 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	178		

			TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc	.946
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min	.26
Carbon Black Content ASTM D4218	Range	%	2.63
Carbon Black Dispersion ASTM D5596	Category		10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi / 2,568 psi
	Average Strength @ Break	31 N/mm (kN/m)	176 ppi / 2,797 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%	17.95
Lo = 2.0" Break	Average Elongation @ Break	%	331.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%	-0.56
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N	54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6 N	97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0 N	143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-5-09**
Signature: H Palmer
Quality Control Department

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ROLL # **249699-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.59	mm	63	mil
Asperity ASTM D7466: 28/31 mil	AVE:	1.56	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	180			

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.64
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,568 psi
	Average Strength @ Break	30 N/mm (kN/m)	172 ppi	2,797 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.95
Lo = 2.0" Break	Average Elongation @ Break	%		331.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N		54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6 N		97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0 N		143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Holmes
Quality Control Department

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ROLL # **249600-09** Lot #: 8290797 **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.47	mm	58	mil
	MAX:	1.65	mm	65	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 ASTM D7466: 31/35 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 180

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.64
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi	2,568 psi
	Average Strength @ Break	30 N/mm (kN/m)	174 ppi	2,797 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.95
Lo = 2.0" Break	Average Elongation @ Break	%		331.6
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N		54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6 N		97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0 N		143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: [signature]
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ROLL # **249601-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.49	mm	59	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 28/33 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 180

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.57
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	157 ppi	2,579 psi
	Average Strength @ Break	33 N/mm (kN/m)	189 ppi	3,105 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		17.57
	Average Elongation @ Break	%		493.8
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N		54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6 N		97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0 N		143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: [signature]
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ROLL # **249602-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.45	mm	57	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 31/36 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 180

						TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc				.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.24
Carbon Black Content ASTM D4218	Range	%				2.57
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	156	ppi	2,579 psi
	Average Strength @ Break	33	N/mm (kN/m)	188	ppi	3,105 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.57
Lo = 2.0" Break	Average Elongation @ Break	%				493.8
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6	N			97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0	N			143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H Holmes
Quality Control Department

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ROLL # **249603-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.59	mm	63	mil
Asperity ASTM D7466: 28/32 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	180		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.63	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi		2,579	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi		3,105	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.57	
Lo = 2.0" Break	Average Elongation @ Break	%			493.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N			54.508	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6 N			97.933	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0 N			143.66	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: [signature]
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ROLL # **249604-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.63	mm	64	mil
Asperity ASTM D7466: 30/30 mil	AVE:	1.57	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	180		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.63
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,579 psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi	3,105 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.57
Lo = 2.0" Break	Average Elongation @ Break	%		493.8
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N		54.508 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6 N		97.933 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0 N		143.66 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature:
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ROLL # **249605-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.66	mm	65	mil
Asperity ASTM D7466: 29/32 mil	AVE:	1.57	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 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.63	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	159 ppi	2,579	psi
	Average Strength @ Break	34	N/mm (kN/m)	192 ppi	3,105	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.57	
Lo = 2.0" Break	Average Elongation @ Break	%			493.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N		54.508	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	435.6	N		97.933	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	639.0	N		143.66	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: H. Palmer
Quality Control Department

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ROLL # **249606-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.52	mm	60	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 30/30 mil	AVE:	1.56	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 180

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24
Carbon Black Content ASTM D4218	Range	%			2.91
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,574	psi
	Average Strength @ Break	35 N/mm (kN/m)	200 ppi	3,254	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.20	
Lo = 2.0" Break	Average Elongation @ Break	%		516.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0 N		54.187	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5 N		97.456	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9 N		138.23	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date:..... 12-5-09

Signature..... H Holmes
Quality Control Department

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ROLL # **249607-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 26/35 mil	AVE:	1.56	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 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.91	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158 ppi	2,574	psi
	Average Strength @ Break	35	N/mm (kN/m)	200 ppi	3,254	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.20	
Lo = 2.0" Break	Average Elongation @ Break	%			516.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0	N		54.187	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5	N		97.456	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9	N		138.23	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: [signature]
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ROLL # **249708-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.51	mm	59	mil
	MAX:	1.58	mm	62	mil
	AVE:	1.55	mm	61	mil

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

Asperity ASTM D7466: 26/35 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 180

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.85
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	157 ppi	2,574 psi
	Average Strength @ Break	35 N/mm (kN/m)	199 ppi	3,254 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.20
	Average Elongation @ Break	%		516.2
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0 N		54.187 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5 N		97.456 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9 N		138.23 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-5-09

Signature: [signature]
Quality Control Department

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ROLL # **249709-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.66	mm	65	mil
Asperity ASTM D7466: 31/31 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	180		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.85	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	157 ppi	2,574	psi
	Average Strength @ Break	35	N/mm (kN/m)	199 ppi	3,254	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.20	
Lo = 2.0" Break	Average Elongation @ Break	%			516.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0	N		54.187	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5	N		97.456	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9	N		138.23	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09
Signature: D. Holmes
Quality Control Department

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ROLL # **249710-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 29/30 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 180

						TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc				.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.24
Carbon Black Content ASTM D4218	Range	%				2.85
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	157	ppi	2,574 psi
	Average Strength @ Break	35	N/mm (kN/m)	199	ppi	3,254 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.20
Lo = 2.0" Break	Average Elongation @ Break	%				516.2
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0	N			54.187 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5	N			97.456 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9	N			138.23 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-6-09**
Signature: St Holmes
Quality Control Department

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ROLL # **249711-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.59	mm	63	mil
Asperity ASTM D7466: 28/34 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 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.66	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	167 ppi	2,739	psi
	Average Strength @ Break	34	N/mm (kN/m)	194 ppi	3,177	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.97	
Lo = 2.0" Break	Average Elongation @ Break	%			486.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0	N		54.187	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5	N		97.456	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9	N		138.23	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes
Quality Control Department

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ROLL # **249712-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.52	mm	60	mil
	MAX:	1.63	mm	64	mil
Asperity ASTM D7466: 26/34 mil	AVE:	1.56	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	180		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.66
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi	2,739 psi
	Average Strength @ Break	34 N/mm (kN/m)	195 ppi	3,177 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.97
Lo = 2.0" Break	Average Elongation @ Break	%		486.9
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0 N		54.187 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5 N		97.456 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9 N		138.23 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: [signature]
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ROLL # **249713-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.51	mm	59	mil
	MAX:	1.62	mm	64	mil
Asperity ASTM D7466: 31/31 mil	AVE:	1.56	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	180			

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.66	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	168 ppi	2,739	psi
	Average Strength @ Break	34	N/mm (kN/m)	195 ppi	3,177	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.97	
Lo = 2.0" Break	Average Elongation @ Break	%			486.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0	N		54.187	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5	N		97.456	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9	N		138.23	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes
Quality Control Department

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ROLL # **249714-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.62	mm	64	mil
Asperity ASTM D7466: 31/35 mil	AVE:	1.57	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 180

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24
Carbon Black Content ASTM D4218	Range	%			2.66
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	169 ppi	2,739	psi
	Average Strength @ Break	34 N/mm (kN/m)	196 ppi	3,177	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.97	
Lo = 2.0" Break	Average Elongation @ Break	%		486.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0 N		54.187	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5 N		97.456	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9 N		138.23	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09
Signature: H Holmes
Quality Control Department

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ROLL # **249715-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH	
Measurement ASTM D5994 (Modified)	MIN:	1.51	mm	59	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 30/35 mil	AVE:	1.56	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 180

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.66
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi	2,739 psi
	Average Strength @ Break	34 N/mm (kN/m)	195 ppi	3,177 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		16.97
	Average Elongation @ Break	%		486.9
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	241.0 N		54.187 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.5 N		97.456 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.9 N		138.23 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: [signature]
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ROLL # **249716-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.53	mm	60	mil
	MAX:	1.70	mm	67	mil
Asperity ASTM D7466: 30/34 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	180		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.50
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	179 ppi	2,878 psi
	Average Strength @ Break	30 N/mm (kN/m)	169 ppi	2,718 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.65
Lo = 2.0" Break	Average Elongation @ Break	%		496.1
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09
Signature: H Holmes
Quality Control Department

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ROLL # **249717-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.62	mm	64	mil
Asperity ASTM D7466: 28/32 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 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.50	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	176 ppi		2,878	psi
	Average Strength @ Break	29 N/mm (kN/m)	166 ppi		2,718	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.65	
Lo = 2.0" Break	Average Elongation @ Break	%			496.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N			57.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N			104.59	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N			144.37	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes

Quality Control Department

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ROLL # **249718-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 28/32 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	180			

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.50
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	174 ppi	2,878 psi
	Average Strength @ Break	29 N/mm (kN/m)	165 ppi	2,718 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.65
Lo = 2.0" Break	Average Elongation @ Break	%		496.1
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09
Signature: H Holmes
Quality Control Department

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ROLL # **249719-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 27/32 mil	AVE:	1.56	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	180		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.50
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	177 ppi	2,878 psi
	Average Strength @ Break	29 N/mm (kN/m)	167 ppi	2,718 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.65
Lo = 2.0" Break	Average Elongation @ Break	%		496.1
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: [signature]

Quality Control Department

60HDm/c.FRM
REV 03
12/23/05

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quality control dept

quality certificate

ROLL # **249720-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.64	mm	65	mil
Asperity ASTM D7466: 28/30 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	180		

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.50
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	174 ppi	2,878 psi
	Average Strength @ Break	29 N/mm (kN/m)	165 ppi	2,718 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.65
Lo = 2.0" Break	Average Elongation @ Break	%		496.1
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes
Quality Control Department

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quality certificate

ROLL # **249721-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.60	mm	63	mil
Asperity ASTM D7466: 30/31 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 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
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	29	N/mm (kN/m)	166 ppi	2,730	psi
	Average Strength @ Break	34	N/mm (kN/m)	191 ppi	3,157	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.79	
Lo = 2.0" Break	Average Elongation @ Break	%			507.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5	N		57.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2	N		104.59	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2	N		144.37	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes

Quality Control Department

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REV 03
12/23/05

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quality certificate

ROLL # **249722-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.66	mm	65	mil
Asperity ASTM D7466: 30/34 mil	AVE:	1.57	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	180			

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
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	30 N/mm (kN/m)	169 ppi	2,730 psi
	Average Strength @ Break	34 N/mm (kN/m)	195 ppi	3,157 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.79
Lo = 2.0" Break	Average Elongation @ Break	%		507.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes
Quality Control Department

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REV 03
12/23/05

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quality control dept

quality certificate

ROLL # **249723-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.49	mm	59	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 31/35 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 180

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.54
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi	2,730 psi
	Average Strength @ Break	34 N/mm (kN/m)	193 ppi	3,157 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.79
Lo = 2.0" Break	Average Elongation @ Break	%		507.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: [signature]
Quality Control Department

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REV 03
12/23/05

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ROLL # **249724-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.54	mm	61	mil
	MAX:	1.61	mm	63	mil
Asperity ASTM D7466: 28/28 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 180

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min				.24	
Carbon Black Content ASTM D4218	Range	%				2.54	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	170	ppi	2,730	psi
	Average Strength @ Break	34	N/mm (kN/m)	196	ppi	3,157	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				16.79	
Lo = 2.0" Break	Average Elongation @ Break	%				507.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.26	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5	N			57.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2	N			104.59	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2	N			144.37	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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: 12-6-09

Signature: H Holmes
Quality Control Department

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ROLL # **249725-09** Lot #: **8290797** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.59 mm	63 mil
Asperity ASTM D7466: 25/28 mil	AVE:	1.56 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	180	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.24
Carbon Black Content ASTM D4218	Range	%		2.54
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi	2,730 psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi	3,157 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.79
Lo = 2.0" Break	Average Elongation @ Break	%		507.7
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.26
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	254.5 N		57.217 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	465.2 N		104.59 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	642.2 N		144.37 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: **Republic Services, Inc.**
PO: **to be given Charlotte Motor Speedway**
Destination **Concord, NC**

Date: **12-6-09**

Signature:

Quality Control Department

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REV 03
12/23/05

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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
	AVE:	1.55	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	%			2.52
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: [signature]
Quality Control Department

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REV 03
12/23/05

agru america quality control dept

quality certificate

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

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH			
	MIN:	1.46 mm	57 mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.84 mm	72 mil	Length.....	125 m	410.1 feet
				Width.....	7.00 m;	23.0 feet
Asperity GRI GM12: 27 mil	AVE:	1.65 mm	65 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	%		2.52
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: [signature]
Quality Control Department

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REV 03
12/23/05

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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	Thickness.....	1.5 mm 60 mil
	MAX:	1.87 mm	74 mil	Length.....	125 m 410.1 feet
				Width.....	7.00 m; 23.0 feet
Asperity GRI GM12: 26 mil	AVE:	1.69 mm	67 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	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: [signature]
Quality Control Department

60HDmic.FRM
REV 03
12/23/05

agru america, inc.

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397
APPENDIX A

LOT # : 8291013 MATERIAL : K307 HDPE DATE : 12-7-09

ROLL # 249226-09 LINER TYPE 60 HD MICRO REF # :

FORMULA FOR APPLIED LOAD : Load = (str@yld x %test x (80% of nom. thickness) x width) - CF / MA

where :

str@yld = Tensile strength @ yield (Transverse Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : 2,412 psi % of yield tested : 30 %

Station used: Mechanical Advantage Used: 5 CF = 77 g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,412 **x** 0.060 **x formula**

LOAD = 378 **g**

PASS @ 300 **HRS**

Specimen Thickness (mils)		Notch Depth (mils)		PASS / FAIL ?	Failure at
#1	0.0605	#1	0.0125	PASS	hours
#2	0.0599	#2	0.0119	PASS	hours
#3	0.0602	#3	0.0122	PASS	hours
#4	0.0605	#4	0.0125	PASS	hours
#5	0.0607	#5	0.0127	PASS	hours
#6		#6	-0.0480 =	-1,219	microns

Comments: all 5 specimens removed after 305 hours with no breaks.

Tested By: JE

Checked By: GP

Test Conditions **Temp:** 71

(At Notching) **Humidity:** 52

NCTL.FRM
REV 02
2/11/10

agru america, inc.

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397
APPENDIX A

LOT # : 8290797 MATERIAL : K307 HDPE DATE : 12-7-09

ROLL # 249699-09 LINER TYPE 60 HD MICRO REF # : _____

FORMULA FOR APPLIED LOAD : Load = (str@yld x %test x (80% of nom. thickness) x width) - CF / MA

where :

str@yld = Tensile strength @ yield (Transverse Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : 2,523 psi % of yield tested : 30 %

Station used: _____ Mechanical Advantage Used: 5 CF = 77 g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,523 **x** 0.060 **x formula**

LOAD = 397 **g**

PASS @ 300 **HRS**

Specimen Thickness		Notch Depth		PASS / FAIL ?	Failure at
#1	0.0621	#1	0.0141	PASS	_____ hours
#2	0.0618	#2	0.0138	PASS	_____ hours
#3	0.0619	#3	0.0139	PASS	_____ hours
#4	0.0615	#4	0.0135	PASS	_____ hours
#5	0.0620	#5	0.0140	PASS	_____ hours

Comments: all 5 specimens removed after 305 hours with no breaks.

Tested By: JE

Checked By: GP

Test Conditions **Temp:** 71

(At Notching) **Humidity:** 52

NCTL.FRM
REV 01
8/10/04

PETROMONT

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.

CoA Date: 11/11/2009

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

CPC Delivery #: 87954820
PO #: 005202
Weight: 189000 LB
Ship Date: 11/11/2009
Package: BULK
Mode: Hopper Car
Car #: PSPX006764
Seal No: 269278

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8291013

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.260	g/10mi
HLMI Flow Rate	ASTM D1238	20.00	g/10mi
Density	D1505 or D4883	0.9380	g/cm3
Pellet Count	P02.08.03	26.000	pel/g
Production Date		11/08/2009	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4637

CoA Date: 10/23/2009

Certificate of Analysis

Shipped To: AGRU AMERICA INC 500 GARRISON RD GEORGETOWN SC 29440 USA	CPC Delivery #: 87943648 PO #: 005202 Weight: 186500 LB Ship Date: 10/23/2009 Package: BULK
Recipient: PALMER Fax:	Mode: Hopper Car Car #: CHVX896206 Seal No: 269096

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8290797

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.240	g/10mi
HLMI Flow Rate	ASTM D1238	21.00	g/10mi
Density	D1505 or D4883	0.9380	g/cm3
Pellet Count	P02.08.03	27.000	pel/g
Production Date		09/24/2009	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4637

of NORTH CAROLINA, PLLC

SECTION I-2
Geocomposite

SKAPS Industries

Engineered Synthetic Products, Inc.

December 4, 2009
Republic Waste Services

Ref. : RWS Charlotte Motor Speedway, NC
Customer P.O. #
Transnet 330-2-8

We certify that the Transnet 330-2-8 drainage composite, meets the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Required Value	Qualifier
Geonet[3]				
Mass per Unit Area	ASTM D 5261	lbs/ft^2	0.30	Minimum
Thickness	ASTM D 5199	mil	330 ± 30	Range
Carbon Black	ASTM D 4218	%	2 - 3	Range
Tensile Strength	ASTM D 5035	lbs/in	90	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	ASTM D 7005	lb/in	0.5	MARV[5]
Transmissivity[1]	ASTM D 4716	m^2/sec	5.0×10^{-4}	MARV
Geotextile[3 & 4]				
Fabric Weight	ASTM D 5261	oz/yd^2	7.2	MARV
Grab Strength	ASTM D 4632	lbs	205	MARV
Grab Elongation	ASTM D 4632	%	50	MARV
Tear Strength	ASTM D 4533	lbs	80	MARV
Puncture Resistance	ASTM D 4833	lbs	95	MARV
Permittivity	ASTM D 4491	sec^{-1}	1.05	MARV
AOS	ASTM D 4751	US Sieve	80	MARV
UV Resistance	ASTM D 4355	%/hrs	70/500	MARV

Notes:

1 Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner 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 : **TN330-2-8**
Project : **RWS 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	347510001	347510001 - N	3475.009	3475.019	1.34	2.32	8.42×10^{-4}
2	347510002	347510002 - N	3475.009	3475.019			
3	347510003	347510003 - N	3475.009	3475.019			
4	347510004	347510004 - N	3475.009	3475.019			
5	347510005	347510005 - N	3475.009	3475.019			
6	347510006	347510006 - N	3475.009	3475.019			
7	347510007	347510007 - N	3475.022	3475.004			
8	347510008	347510008 - N	3475.022	3475.004			
9	347510009	347510009 - N	3475.022	3475.004			
10	347510010	347510010 - N	3475.022	3475.004	1.29	2.31	
11	347510011	347510011 - N	3475.022	3475.004			
12	347510012	347510012 - N	3475.022	3475.004			
13	347510013	347510013 - N	3475.011	3475.017			
14	347510014	347510014 - N	3475.011	3475.017			
15	347510015	347510015 - N	3475.011	3475.017			
16	347510016	347510016 - N	3475.011	3475.017			
17	347510017	347510017 - N	3475.011	3475.017			
18	347510018	347510018 - N	3475.011	3475.017			
19	347510019	347510019 - N	3475.026	3475.006			
20	347510020	347510020 - N	3475.026	3475.006	1.42	2.55	
21	347510021	347510021 - N	3475.026	3475.006			
22	347510022	347510022 - N	3475.026	3475.006			
23	347510023	347510023 - N	3475.026	3475.006			
24	347510024	347510024 - N	3475.026	3475.006			
25	347510025	347510025 - N	3475.013	3475.023			
26	347510026	347510026 - N	3475.013	3475.023			
27	347510027	347510027 - N	3475.013	3475.023			

* 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 & liner after 24 hours.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510001 - N	4097-4	0.9556	0.345	309	2.26	106	
347510002 - N	4097-4	0.9556					
347510003 - N	4097-4	0.9556					
347510004 - N	4097-4	0.9556					
347510005 - N	4097-4	0.9556					
347510006 - N	4097-4	0.9556					
347510007 - N	4097-4	0.9556					
347510008 - N	4097-4	0.9556					
347510009 - N	4097-4	0.9556					
347510010 - N	4097-4	0.9556	0.358	321	2.65	110	
347510011 - N	4097-4	0.9556					
347510012 - N	4097-4	0.9556					
347510013 - N	4097-4	0.9556					
347510014 - N	4097-4	0.9556					
347510015 - N	4097-4	0.9556					
347510016 - N	4097-4	0.9556					
347510017 - N	4097-4	0.9556					
347510018 - N	4097-4	0.9556					
347510019 - N	4097-4	0.9556					
347510020 - N	4097-4	0.9556	0.347	311	2.29	105	
347510021 - N	4097-4	0.9556					
347510022 - N	4097-4	0.9556					
347510023 - N	4097-4	0.9556					
347510024 - N	4097-4	0.9556					
347510025 - N	4097-4	0.9556					
347510026 - N	4097-4	0.9556					
347510027 - N	4097-4	0.9556					

APPROVED 5 QA

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Project : **RWS Charlotte Motor Speedway, NC**

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Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity* (m^2/sec)
			Top	Bottom	Minimum	Average	
1	347510028	347510028 - N	3475.013	3475.023			
2	347510029	347510029 - N	3475.013	3475.023			
3	347510030	347510030 - N	3475.013	3475.023	1.47	2.44	
4	347510031	347510031 - N	3475.018	3475.010			
5	347510032	347510032 - N	3475.018	3475.010			
6	347510033	347510033 - N	3475.018	3475.010			
7	347510034	347510034 - N	3475.018	3475.010			
8	347510035	347510035 - N	3475.018	3475.010			
9	347510036	347510036 - N	3475.018	3475.010			
10	347510037	347510037 - N	3475.005	3475.027			
11	347510038	347510038 - N	3475.005	3475.027			
12	347510039	347510039 - N	3475.005	3475.027			
13	347510040	347510040 - N	3475.005	3475.027	1.66	2.61	
14	347510041	347510041 - N	3475.005	3475.027			
15	347510042	347510042 - N	3475.005	3475.027			
16	347510043	347510043 - N	3475.024	3475.002			
17	347510044	347510044 - N	3475.024	3475.002			
18	347510045	347510045 - N	3475.024	3475.002			
19	347510046	347510046 - N	3475.024	3475.002			
20	347510047	347510047 - N	3475.024	3475.002			
21	347510048	347510048 - N	3475.024	3475.002			
22	347510049	347510049 - N	3475.003	3475.015			
23	347510050	347510050 - N	3475.003	3475.015	1.84	2.88	
24	347510051	347510051 - N	3475.003	3475.015			
25	347510052	347510052 - N	3475.003	3475.015			
26	347510053	347510053 - N	3475.003	3475.015			
27	347510054	347510054 - N	3475.003	3475.015			

* 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 & liner after 24 hours.

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510028 - N	4097-4	0.9556					
347510029 - N	4097-4	0.9556					
347510030 - N	4097-4	0.9556	0.356	319	2.62	108	
347510031 - N	4097-4	0.9556					
347510032 - N	4097-4	0.9556					
347510033 - N	4097-4	0.9556					
347510034 - N	4097-4	0.9556					
347510035 - N	4097-4	0.9561					
347510036 - N	4097-4	0.9561					
347510037 - N	4097-4	0.9561					
347510038 - N	4097-4	0.9561					
347510039 - N	4097-4	0.9561					
347510040 - N	4097-4	0.9561	0.349	313	2.31	106	
347510041 - N	4097-4	0.9561					
347510042 - N	4097-4	0.9561					
347510043 - N	4097-4	0.9561					
347510044 - N	4097-4	0.9561					
347510045 - N	4097-4	0.9561					
347510046 - N	4097-4	0.9561					
347510047 - N	4097-4	0.9561					
347510048 - N	4097-4	0.9561					
347510049 - N	4097-4	0.9561					
347510050 - N	4097-4	0.9561	0.354	317	2.60	109	
347510051 - N	4097-4	0.9561					
347510052 - N	4097-4	0.9561					
347510053 - N	4097-4	0.9561					
347510054 - N	4097-4	0.9561					

APPROVED 5 QA

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Project : **RWS 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	347510055	347510055 - N	3475.020	3475.008			
2	347510056	347510056 - N	3475.020	3475.008			
3	347510057	347510057 - N	3475.020	3475.008			
4	347510058	347510058 - N	3475.020	3475.008			
5	347510059	347510059 - N	3475.020	3475.008			
6	347510060	347510060 - N	3475.020	3475.008	1.50	2.30	
7	347510061	347510061 - N	3475.007	3475.025			
8	347510062	347510062 - N	3475.007	3475.025			
9	347510063	347510063 - N	3475.007	3475.025			
10	347510064	347510064 - N	3475.007	3475.025			
11	347510065	347510065 - N	3475.007	3475.025			
12	347510066	347510066 - N	3475.007	3475.025			
13	347510067	347510067 - N	3475.016	3475.012			
14	347510068	347510068 - N	3475.016	3475.012			
15	347510069	347510069 - N	3475.016	3475.012			
16	347510070	347510070 - N	3475.016	3475.012	1.43	2.38	
17	347510071	347510071 - N	3475.016	3475.012			
18	347510072	347510072 - N	3475.016	3475.012			
19	347510073	347510073 - N	3475.001	3475.021			
20	347510074	347510074 - N	3475.001	3475.021			
21	347510075	347510075 - N	3475.001	3475.021			
22	347510076	347510076 - N	3475.001	3475.021			
23	347510077	347510077 - N	3475.001	3475.021			
24	347510078	347510078 - N	3475.001	3475.021			
25	347510079	347510079 - N	3475.014	3475.031			
26	347510080	347510080 - N	3475.014	3475.031	1.72	2.47	8.71×10^{-4}
27	347510081	347510081 - N	3475.014	3475.031			

* 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 & liner after 24 hours.

APPROVED 5 QA

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SKAPS Industries

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Product : **TN330-2-8**
Project : **RWS 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)
347510055 - N	4097-4	0.9561					
347510056 - N	4097-4	0.9561					
347510057 - N	4097-4	0.9561					
347510058 - N	4097-4	0.9561					
347510059 - N	4097-4	0.9561					
347510060 - N	4097-4	0.9561	0.343	310	2.34	107	
347510061 - N	4097-4	0.9561					
347510062 - N	4097-4	0.9561					
347510063 - N	4097-4	0.9561					
347510064 - N	4097-4	0.9561					
347510065 - N	4097-4	0.9561					
347510066 - N	4097-4	0.9561					
347510067 - N	4097-4	0.9561					
347510068 - N	4097-4	0.9561					
347510069 - N	4097-4	0.9561					
347510070 - N	4097-4	0.9552	0.352	315	2.57	110	
347510071 - N	4097-4	0.9552					
347510072 - N	4097-4	0.9552					
347510073 - N	4097-4	0.9552					
347510074 - N	4097-4	0.9552					
347510075 - N	4097-4	0.9552					
347510076 - N	4097-4	0.9552					
347510077 - N	4097-4	0.9552					
347510078 - N	4097-4	0.9552					
347510079 - N	4097-4	0.9552					
347510080 - N	4097-4	0.9552	0.346	308	2.37	105	
347510081 - N	4097-4	0.9552					

APPROVED 5 QA

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Product : **TN330-2-8**
Project : **RWS 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	347510082	347510082 - N	3475.014	3475.031			
2	347510083	347510083 - N	3475.014	3475.031			
3	347510084	347510084 - N	3475.014	3475.031			
4	347510085	347510085 - N	3475.034	3475.047			
5	347510086	347510086 - N	3475.034	3475.047			
6	347510087	347510087 - N	3475.034	3475.047			
7	347510088	347510088 - N	3475.034	3475.047			
8	347510089	347510089 - N	3475.034	3475.047			
9	347510090	347510090 - N	3475.034	3475.047	1.54	2.65	
10	347510091	347510091 - N	3475.050	3475.037			
11	347510092	347510092 - N	3475.050	3475.037			
12	347510093	347510093 - N	3475.050	3475.037			
13	347510094	347510094 - N	3475.050	3475.037			
14	347510095	347510095 - N	3475.050	3475.037			
15	347510096	347510096 - N	3475.050	3475.037			
16	347510097	347510097 - N	3475.038	3475.051			
17	347510098	347510098 - N	3475.038	3475.051			
18	347510099	347510099 - N	3475.038	3475.051			
19	347510100	347510100 - N	3475.038	3475.051	1.77	2.92	
20	347510101	347510101 - N	3475.038	3475.051			
21	347510102	347510102 - N	3475.038	3475.051			
22	347510103	347510103 - N	3475.046	3475.033			
23	347510104	347510104 - N	3475.046	3475.033			
24	347510105	347510105 - N	3475.046	3475.033			
25	347510106	347510106 - N	3475.046	3475.033			
26	347510107	347510107 - N	3475.046	3475.033			
27	347510108	347510108 - N	3475.046	3475.033			

* 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 & liner after 24 hours.

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510082 - N	4097-4	0.9552					
347510083 - N	4097-4	0.9552					
347510084 - N	4097-4	0.9552					
347510085 - N	4097-4	0.9552					
347510086 - N	4097-4	0.9552					
347510087 - N	4097-4	0.9552					
347510088 - N	4097-4	0.9552					
347510089 - N	4097-4	0.9552					
347510090 - N	4106-1	0.9552	0.353	322	2.55	108	
347510091 - N	4106-1	0.9552					
347510092 - N	4106-1	0.9552					
347510093 - N	4106-1	0.9552					
347510094 - N	4106-1	0.9552					
347510095 - N	4106-1	0.9552					
347510096 - N	4106-1	0.9552					
347510097 - N	4106-1	0.9552					
347510098 - N	4106-1	0.9552					
347510099 - N	4106-1	0.9552					
347510100 - N	4106-1	0.9552	0.344	312	2.40	106	
347510101 - N	4106-1	0.9552					
347510102 - N	4106-1	0.9552					
347510103 - N	4106-1	0.9552					
347510104 - N	4106-1	0.9552					
347510105 - N	4106-1	0.9558					
347510106 - N	4106-1	0.9558					
347510107 - N	4106-1	0.9558					
347510108 - N	4106-1	0.9558					

APPROVED 5 QA

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Product : **TN330-2-8**
Project : **RWS 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	347510109	347510109 - N	3475.030	3475.043			
2	347510110	347510110 - N	3475.030	3475.043	1.36	2.88	
3	347510111	347510111 - N	3475.030	3475.043			
4	347510112	347510112 - N	3475.030	3475.043			
5	347510113	347510113 - N	3475.030	3475.043			
6	347510114	347510114 - N	3475.030	3475.043			
7	347510115	347510115 - N	3475.052	3475.029			
8	347510116	347510116 - N	3475.052	3475.029			
9	347510117	347510117 - N	3475.052	3475.029			
10	347510118	347510118 - N	3475.052	3475.029			
11	347510119	347510119 - N	3475.052	3475.029			
12	347510120	347510120 - N	3475.052	3475.029	1.74	2.65	
13	347510121	347510121 - N	3475.036	3475.049			
14	347510122	347510122 - N	3475.036	3475.049			
15	347510123	347510123 - N	3475.036	3475.049			
16	347510124	347510124 - N	3475.036	3475.049			
17	347510125	347510125 - N	3475.036	3475.049			
18	347510126	347510126 - N	3475.036	3475.049			
19	347510127	347510127 - N	3475.044	3475.039			
20	347510128	347510128 - N	3475.044	3475.039			
21	347510129	347510129 - N	3475.044	3475.039			
22	347510130	347510130 - N	3475.044	3475.039	1.39	2.94	
23	347510131	347510131 - N	3475.044	3475.039			
24	347510132	347510132 - N	3475.044	3475.039			
25	347510133	347510133 - N	3475.032	3475.053			
26	347510134	347510134 - N	3475.032	3475.053			
27	347510135	347510135 - N	3475.032	3475.053			

* 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 & liner after 24 hours.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510109 - N	4106-1	0.9558					
347510110 - N	4106-1	0.9558	0.356	320	2.52	109	
347510111 - N	4106-1	0.9558					
347510112 - N	4106-1	0.9558					
347510113 - N	4106-1	0.9558					
347510114 - N	4106-1	0.9558					
347510115 - N	4106-1	0.9558					
347510116 - N	4106-1	0.9558					
347510117 - N	4106-1	0.9558					
347510118 - N	4106-1	0.9558					
347510119 - N	4106-1	0.9558					
347510120 - N	4106-1	0.9558	0.342	314	2.23	107	
347510121 - N	4106-1	0.9558					
347510122 - N	4106-1	0.9558					
347510123 - N	4106-1	0.9558					
347510124 - N	4106-1	0.9558					
347510125 - N	4106-1	0.9558					
347510126 - N	4106-1	0.9558					
347510127 - N	4106-1	0.9558					
347510128 - N	4106-1	0.9558					
347510129 - N	4106-1	0.9558					
347510130 - N	4106-1	0.9558	0.359	318	2.49	110	
347510131 - N	4106-1	0.9558					
347510132 - N	4106-1	0.9558					
347510133 - N	4106-1	0.9558					
347510134 - N	4106-1	0.9558					
347510135 - N	4106-1	0.9558					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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	347510136	347510136 - N	3475.032	3475.053			
2	347510137	347510137 - N	3475.032	3475.053			
3	347510138	347510138 - N	3475.032	3475.053			
4	347510139	347510139 - N	3475.048	3475.041			
5	347510140	347510140 - N	3475.048	3475.041	1.83	2.36	
6	347510141	347510141 - N	3475.048	3475.041			
7	347510142	347510142 - N	3475.048	3475.041			
8	347510143	347510143 - N	3475.048	3475.041			
9	347510144	347510144 - N	3475.048	3475.041			
10	347510145	347510145 - N	3475.040	3475.045			
11	347510146	347510146 - N	3475.040	3475.045			
12	347510147	347510147 - N	3475.040	3475.045			
13	347510148	347510148 - N	3475.040	3475.045			
14	347510149	347510149 - N	3475.040	3475.045			
15	347510150	347510150 - N	3475.040	3475.045	1.92	2.84	
16	347510151	347510151 - N	3475.054	3475.035			
17	347510152	347510152 - N	3475.054	3475.035			
18	347510153	347510153 - N	3475.054	3475.035			
19	347510154	347510154 - N	3475.054	3475.035			
20	347510155	347510155 - N	3475.054	3475.035			
21	347510156	347510156 - N	3475.054	3475.035			
22	347510157	347510157 - N	3475.028	3475.042			
23	347510158	347510158 - N	3475.028	3475.042			
24	347510159	347510159 - N	3475.028	3475.042			
25	347510160	347510160 - N	3475.028	3475.042	1.70	2.39	8.49×10^{-4}
26	347510161	347510161 - N	3475.028	3475.042			
27	347510162	347510162 - N	3475.028	3475.042			

* 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 & liner after 24 hours.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510136 - N	4106-1	0.9558					
347510137 - N	4106-1	0.9558					
347510138 - N	4106-1	0.9558					
347510139 - N	4106-1	0.9558					
347510140 - N	4106-1	0.9555	0.348	311	2.27	106	
347510141 - N	4106-1	0.9555					
347510142 - N	4106-1	0.9555					
347510143 - N	4106-1	0.9555					
347510144 - N	4106-1	0.9555					
347510145 - N	4106-1	0.9555					
347510146 - N	4106-1	0.9555					
347510147 - N	4106-1	0.9555					
347510148 - N	4106-1	0.9555					
347510149 - N	4106-1	0.9555					
347510150 - N	4106-1	0.9555	0.357	316	2.46	108	
347510151 - N	4106-1	0.9555					
347510152 - N	4106-1	0.9555					
347510153 - N	4106-1	0.9555					
347510154 - N	4106-1	0.9555					
347510155 - N	4106-1	0.9555					
347510156 - N	4106-1	0.9555					
347510157 - N	4106-1	0.9555					
347510158 - N	4106-1	0.9555					
347510159 - N	4106-1	0.9555					
347510160 - N	4106-1	0.9555	0.351	313	2.30	105	
347510161 - N	4106-1	0.9555					
347510162 - N	4106-1	0.9555					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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	347510163	347510163 - N	3475.076	3475.059			
2	347510164	347510164 - N	3475.076	3475.059			
3	347510165	347510165 - N	3475.076	3475.059			
4	347510166	347510166 - N	3475.076	3475.059			
5	347510167	347510167 - N	3475.076	3475.059			
6	347510168	347510168 - N	3475.076	3475.059			
7	347510169	347510169 - N	3475.062	3475.079			
8	347510170	347510170 - N	3475.062	3475.079	1.89	2.82	
9	347510171	347510171 - N	3475.062	3475.079			
10	347510172	347510172 - N	3475.062	3475.079			
11	347510173	347510173 - N	3475.062	3475.079			
12	347510174	347510174 - N	3475.062	3475.079			
13	347510175	347510175 - N	3475.080	3475.057			
14	347510176	347510176 - N	3475.080	3475.057			
15	347510177	347510177 - N	3475.080	3475.057			
16	347510178	347510178 - N	3475.080	3475.057			
17	347510179	347510179 - N	3475.080	3475.057			
18	347510180	347510180 - N	3475.080	3475.057	1.80	2.42	
19	347510181	347510181 - N	3475.064	3475.077			
20	347510182	347510182 - N	3475.064	3475.077			
21	347510183	347510183 - N	3475.064	3475.077			
22	347510184	347510184 - N	3475.064	3475.077			
23	347510185	347510185 - N	3475.064	3475.077			
24	347510186	347510186 - N	3475.064	3475.077			
25	347510187	347510187 - N	3475.074	3475.063			
26	347510188	347510188 - N	3475.074	3475.063			
27	347510189	347510189 - N	3475.074	3475.063			

* 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 & liner after 24 hours.

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510163 - N	4106-1	0.9555					
347510164 - N	4106-1	0.9555					
347510165 - N	4106-1	0.9555					
347510166 - N	4106-1	0.9555					
347510167 - N	4106-1	0.9555					
347510168 - N	4106-1	0.9555					
347510169 - N	4106-1	0.9555					
347510170 - N	4106-1	0.9555	0.355	319	2.44	109	
347510171 - N	4106-1	0.9555					
347510172 - N	4106-1	0.9555					
347510173 - N	4106-1	0.9555					
347510174 - N	4106-1	0.9555					
347510175 - N	4106-1	0.9562					
347510176 - N	4106-1	0.9562					
347510177 - N	4106-1	0.9562					
347510178 - N	4106-1	0.9562					
347510179 - N	4106-1	0.9562					
347510180 - N	4106-1	0.9562	0.347	309	2.33	107	
347510181 - N	4106-1	0.9562					
347510182 - N	4106-1	0.9562					
347510183 - N	4106-1	0.9562					
347510184 - N	4106-1	0.9562					
347510185 - N	4106-1	0.9562					
347510186 - N	4106-1	0.9562					
347510187 - N	4106-1	0.9562					
347510188 - N	4106-1	0.9562					
347510189 - N	4106-1	0.9562					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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	347510190	347510190 - N	3475.074	3475.063	1.34	2.42	
2	347510191	347510191 - N	3475.074	3475.063			
3	347510192	347510192 - N	3475.074	3475.063			
4	347510193	347510193 - N	3475.060	3475.075			
5	347510194	347510194 - N	3475.060	3475.075			
6	347510195	347510195 - N	3475.060	3475.075			
7	347510196	347510196 - N	3475.060	3475.075			
8	347510197	347510197 - N	3475.060	3475.075			
9	347510198	347510198 - N	3475.060	3475.075			
10	347510199	347510199 - N	3475.072	3475.065			
11	347510200	347510200 - N	3475.072	3475.065	1.69	2.45	
12	347510201	347510201 - N	3475.072	3475.065			
13	347510202	347510202 - N	3475.072	3475.065			
14	347510203	347510203 - N	3475.072	3475.065			
15	347510204	347510204 - N	3475.072	3475.065			
16	347510205	347510205 - N	3475.058	3475.073			
17	347510206	347510206 - N	3475.058	3475.073			
18	347510207	347510207 - N	3475.058	3475.073			
19	347510208	347510208 - N	3475.058	3475.073			
20	347510209	347510209 - N	3475.058	3475.073			
21	347510210	347510210 - N	3475.058	3475.073	1.56	2.77	
22	347510211	347510211 - N	3475.078	3475.061			
23	347510212	347510212 - N	3475.078	3475.061			
24	347510213	347510213 - N	3475.078	3475.061			
25	347510214	347510214 - N	3475.078	3475.061			
26	347510215	347510215 - N	3475.078	3475.061			
27	347510216	347510216 - N	3475.078	3475.061			

* 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 & liner after 24 hours.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510190 - N	4106-1	0.9562	0.353	321	2.68	110	
347510191 - N	4106-1	0.9562					
347510192 - N	4106-1	0.9562					
347510193 - N	4106-1	0.9562					
347510194 - N	4106-1	0.9562					
347510195 - N	4106-1	0.9562					
347510196 - N	4106-1	0.9562					
347510197 - N	4106-1	0.9562					
347510198 - N	4106-1	0.9562					
347510199 - N	4106-1	0.9562					
347510200 - N	4106-1	0.9562	0.345	315	2.36	106	
347510201 - N	4106-1	0.9562					
347510202 - N	4106-1	0.9562					
347510203 - N	4106-1	0.9562					
347510204 - N	4106-1	0.9562					
347510205 - N	4106-1	0.9562					
347510206 - N	4106-1	0.9562					
347510207 - N	4106-1	0.9562					
347510208 - N	4106-1	0.9562					
347510209 - N	4106-1	0.9562					
347510210 - N	4106-1	0.9554	0.358	318	2.64	108	
347510211 - N	4106-1	0.9554					
347510212 - N	4106-1	0.9554					
347510213 - N	4106-1	0.9554					
347510214 - N	4106-1	0.9554					
347510215 - N	4106-1	0.9554					
347510216 - N	4106-1	0.9554					

APPROVED 5 QA

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Product : **TN330-2-8**
Project : **RWS 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	347510217	347510217 - N	3475.066	3475.071			
2	347510218	347510218 - N	3475.066	3475.071			
3	347510219	347510219 - N	3475.066	3475.071			
4	347510220	347510220 - N	3475.066	3475.071	1.82	2.48	
5	347510221	347510221 - N	3475.066	3475.071			
6	347510222	347510222 - N	3475.066	3475.071			
7	347510223	347510223 - N	3475.070	3475.068			
8	347510224	347510224 - N	3475.070	3475.068			
9	347510225	347510225 - N	3475.070	3475.068			
10	347510226	347510226 - N	3475.070	3475.068			
11	347510227	347510227 - N	3475.070	3475.068			
12	347510228	347510228 - N	3475.070	3475.068			
13	347510229	347510229 - N	3475.056	3475.101			
14	347510230	347510230 - N	3475.056	3475.101	1.85	2.72	
15	347510231	347510231 - N	3475.056	3475.101			
16	347510232	347510232 - N	3475.056	3475.101			
17	347510233	347510233 - N	3475.056	3475.101			
18	347510234	347510234 - N	3475.056	3475.101			
19	347510235	347510235 - N	3475.081	3475.055			
20	347510236	347510236 - N	3475.081	3475.055			
21	347510237	347510237 - N	3475.081	3475.055			
22	347510238	347510238 - N	3475.081	3475.055			
23	347510239	347510239 - N	3475.081	3475.055			
24	347510240	347510240 - N	3475.081	3475.055	1.76	2.50	8.66×10^{-4}
25	347510241	347510241 - N	3475.067	3475.103			
26	347510242	347510242 - N	3475.067	3475.103			
27	347510243	347510243 - N	3475.067	3475.103			

* 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 & liner after 24 hours.

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510217 - N	4106-1	0.9554					
347510218 - N	4106-1	0.9554					
347510219 - N	4106-1	0.9554					
347510220 - N	4106-1	0.9554	0.348	308	2.21	105	
347510221 - N	4106-1	0.9554					
347510222 - N	4106-1	0.9554					
347510223 - N	4106-1	0.9554					
347510224 - N	4106-1	0.9554					
347510225 - N	4106-1	0.9554					
347510226 - N	4106-1	0.9554					
347510227 - N	4106-1	0.9554					
347510228 - N	4106-1	0.9554					
347510229 - N	4106-1	0.9554					
347510230 - N	4106-1	0.9554	0.356	316	2.61	109	
347510231 - N	4106-1	0.9554					
347510232 - N	4106-1	0.9554					
347510233 - N	4106-1	0.9554					
347510234 - N	4106-1	0.9554					
347510235 - N	4106-1	0.9554					
347510236 - N	4106-1	0.9554					
347510237 - N	4106-1	0.9554					
347510238 - N	4106-1	0.9554					
347510239 - N	4106-1	0.9554					
347510240 - N	4106-1	0.9554	0.344	310	2.24	107	
347510241 - N	4106-1	0.9554					
347510242 - N	4106-1	0.9554					
347510243 - N	4106-1	0.9554					

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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	347510244	347510244 - N	3475.067	3475.103			
2	347510245	347510245 - N	3475.067	3475.103			
3	347510246	347510246 - N	3475.067	3475.103			
4	347510247	347510247 - N	3475.098	3475.089			
5	347510248	347510248 - N	3475.098	3475.089			
6	347510249	347510249 - N	3475.098	3475.089			
7	347510250	347510250 - N	3475.098	3475.089	1.87	2.69	
8	347510251	347510251 - N	3475.098	3475.089			
9	347510252	347510252 - N	3475.098	3475.089			
10	347510253	347510253 - N	3475.069	3475.097			
11	347510254	347510254 - N	3475.069	3475.097			
12	347510255	347510255 - N	3475.069	3475.097			
13	347510256	347510256 - N	3475.069	3475.097			
14	347510257	347510257 - N	3475.069	3475.097			
15	347510258	347510258 - N	3475.069	3475.097			
16	347510259	347510259 - N	3475.102	3475.091			
17	347510260	347510260 - N	3475.102	3475.091	1.79	2.22	
18	347510261	347510261 - N	3475.102	3475.091			
19	347510262	347510262 - N	3475.102	3475.091			
20	347510263	347510263 - N	3475.102	3475.091			
21	347510264	347510264 - N	3475.102	3475.091			
22	347510265	347510265 - N	3475.086	3475.105			
23	347510266	347510266 - N	3475.086	3475.105			
24	347510267	347510267 - N	3475.086	3475.105			
25	347510268	347510268 - N	3475.086	3475.105			
26	347510269	347510269 - N	3475.086	3475.105			
27	347510270	347510270 - N	3475.086	3475.105	1.84	2.66	

* 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 & liner after 24 hours.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510244 - N	4106-1	0.9554					
347510245 - N	4106-1	0.9567					
347510246 - N	4106-1	0.9567					
347510247 - N	4106-1	0.9567					
347510248 - N	4106-1	0.9567					
347510249 - N	4106-1	0.9567					
347510250 - N	4106-1	0.9567	0.354	322	2.58	110	
347510251 - N	4106-1	0.9567					
347510252 - N	4106-1	0.9567					
347510253 - N	4106-1	0.9567					
347510254 - N	4106-1	0.9567					
347510255 - N	4106-1	0.9567					
347510256 - N	4106-1	0.9567					
347510257 - N	4106-1	0.9567					
347510258 - N	4106-1	0.9567					
347510259 - N	4106-1	0.9567					
347510260 - N	4106-1	0.9567	0.346	312	2.38	106	
347510261 - N	4106-1	0.9567					
347510262 - N	4106-1	0.9567					
347510263 - N	4106-1	0.9567					
347510264 - N	4106-1	0.9567					
347510265 - N	4106-1	0.9567					
347510266 - N	4106-1	0.9567					
347510267 - N	4106-1	0.9567					
347510268 - N	4106-1	0.9567					
347510269 - N	4106-1	0.9567					
347510270 - N	4106-1	0.9567	0.352	319	2.56	108	

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571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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	347510271	347510271 - N	3475.096	3475.085			
2	347510272	347510272 - N	3475.096	3475.085			
3	347510273	347510273 - N	3475.096	3475.085			
4	347510274	347510274 - N	3475.096	3475.085			
5	347510275	347510275 - N	3475.096	3475.085			
6	347510276	347510276 - N	3475.096	3475.085			
7	347510277	347510277 - N	3475.092	3475.095			
8	347510278	347510278 - N	3475.092	3475.095			
9	347510279	347510279 - N	3475.092	3475.095			
10	347510280	347510280 - N	3475.092	3475.095	1.71	2.38	
11	347510281	347510281 - N	3475.092	3475.095			
12	347510282	347510282 - N	3475.092	3475.095			
13	347510283	347510283 - N	3475.104	3475.087			
14	347510284	347510284 - N	3475.104	3475.087			
15	347510285	347510285 - N	3475.104	3475.087			
16	347510286	347510286 - N	3475.104	3475.087			
17	347510287	347510287 - N	3475.104	3475.087			
18	347510288	347510288 - N	3475.104	3475.087			
19	347510289	347510289 - N	3475.088	3475.099			
20	347510290	347510290 - N	3475.088	3475.099	1.91	2.61	
21	347510291	347510291 - N	3475.088	3475.099			
22	347510292	347510292 - N	3475.088	3475.099			
23	347510293	347510293 - N	3475.088	3475.099			
24	347510294	347510294 - N	3475.088	3475.099			
25	347510295	347510295 - N	3475.100	3475.083			
26	347510296	347510296 - N	3475.100	3475.083			
27	347510297	347510297 - N	3475.100	3475.083			

* 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 & liner after 24 hours.

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571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510271 - N	4106-1	0.9567					
347510272 - N	4106-1	0.9567					
347510273 - N	4106-1	0.9567					
347510274 - N	4106-1	0.9567					
347510275 - N	4106-1	0.9567					
347510276 - N	4106-1	0.9567					
347510277 - N	4106-1	0.9567					
347510278 - N	4106-1	0.9567					
347510279 - N	4106-1	0.9567					
347510280 - N	4106-1	0.9557	0.342	314	2.41	105	
347510281 - N	4106-1	0.9557					
347510282 - N	4106-1	0.9557					
347510283 - N	4106-1	0.9557					
347510284 - N	4106-1	0.9557					
347510285 - N	4106-1	0.9557					
347510286 - N	4106-1	0.9557					
347510287 - N	4106-1	0.9557					
347510288 - N	4106-1	0.9557					
347510289 - N	4106-1	0.9557					
347510290 - N	4106-1	0.9557	0.355	317	2.53	109	
347510291 - N	4106-1	0.9557					
347510292 - N	4106-1	0.9557					
347510293 - N	4106-1	0.9557					
347510294 - N	4106-1	0.9557					
347510295 - N	4106-1	0.9557					
347510296 - N	4106-1	0.9557					
347510297 - N	4106-1	0.9557					

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571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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	347510298	347510298 - N	3475.100	3475.083			
2	347510299	347510299 - N	3475.100	3475.083			
3	347510300	347510300 - N	3475.100	3475.083	1.78	2.34	
4	347510301	347510301 - N	3475.090	3475.106			
5	347510302	347510302 - N	3475.090	3475.106			
6	347510303	347510303 - N	3475.090	3475.106			
7	347510304	347510304 - N	3475.090	3475.106			
8	347510305	347510305 - N	3475.090	3475.106			
9	347510306	347510306 - N	3475.090	3475.106			
10	347510307	347510307 - N	3475.094	3475.082			
11	347510308	347510308 - N	3475.094	3475.082			
12	347510309	347510309 - N	3475.094	3475.082			
13	347510310	347510310 - N	3475.094	3475.082	1.93	2.55	
14	347510311	347510311 - N	3475.094	3475.082			
15	347510312	347510312 - N	3475.094	3475.082			
16	347510313	347510313 - N	3475.084	3475.093			
17	347510314	347510314 - N	3475.084	3475.093			
18	347510315	347510315 - N	3475.084	3475.093			

* 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 & liner after 24 hours.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS 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)
347510298 - N	4106-1	0.9557					
347510299 - N	4106-1	0.9557					
347510300 - N	4106-1	0.9557	0.347	311	2.45	106	
347510301 - N	4106-1	0.9557					
347510302 - N	4106-1	0.9557					
347510303 - N	4106-1	0.9557					
347510304 - N	4106-1	0.9557					
347510305 - N	4106-1	0.9557					
347510306 - N	4106-1	0.9557					
347510307 - N	4106-1	0.9557					
347510308 - N	4106-1	0.9557					
347510309 - N	4106-1	0.9557					
347510310 - N	4106-1	0.9557	0.351	315	2.67	110	
347510311 - N	4106-1	0.9557					
347510312 - N	4106-1	0.9557					
347510313 - N	4106-1	0.9557					
347510314 - N	4106-1	0.9557					
347510315 - N	4106-1	0.9563					

APPROVED 5 QA

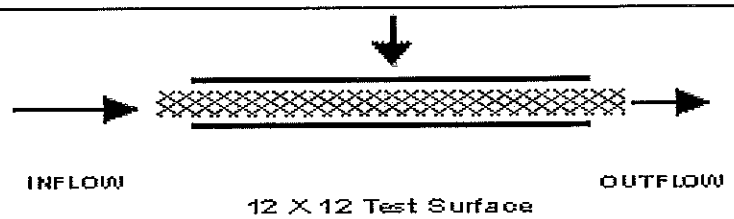
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Republic Waste Services	**Job #**	3475
Project:	RWS Charlotte Motor Speedway, NC		
Product:	TN330-2-8		

Test Configuration:



Test Information:

Boundary Conditions:	Sand Geocomposite Liner	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.25 ft 24 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec 24 hours
347510001	10000	0.25	8.42×10^{-4}
347510080			8.71×10^{-4}
347510160			8.49×10^{-4}

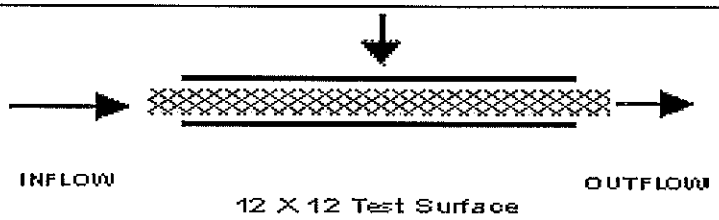
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Republic Waste Services	**Job #**	3475
Project:	RWS Charlotte Motor Speedway, NC		
Product:	TN330-2-8		
Roll #	347510240		

Test Configuration:



Test Information:

Boundary Conditions:	Sand Geocomposite Liner	**Normal Load:**	10000 psf
		Gradient:	0.25 ft
		Seating Time:	24 hours
		Flow Direction:	MD

Test Results:

Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec
		24 hours
10000	0.25	8.66×10^{-4}

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347610037
TRI Log #: E2348-58-08

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

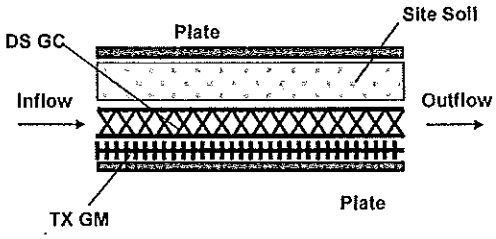


Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1	2	3	MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)	1305	1294	1297			
	Time (s)	90.35	89.87	90.44			
24	Flow Rate (GPM/ft width)	0.23	0.23	0.23	0.23	0.00	
	Transmissivity (m^2/s)	9.48E-04	9.45E-04	9.41E-04	9.45E-04	3.38E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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: Republic Services
Project: Charlotte Motor Speedway

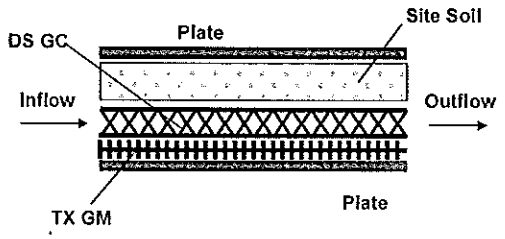
Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510039
TRI Log #: E2348-58-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate



PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen												
Volume (cc)		838	841	841									
Time (s)		45.38	45.43	45.49									
Flow Rate (GPM/ft width)		0.29	0.29	0.29							0.29	0.00	
24 Transmissivity (m^2/s)		1.21E-03	1.21E-03	1.21E-03							1.21E-03	1.50E-06	$5x10^{-4}$ min
Test Temp (C)			20.0										
Temp. Corr. Factor			1.000										

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510093
TRI Log #: E2348-58-08

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

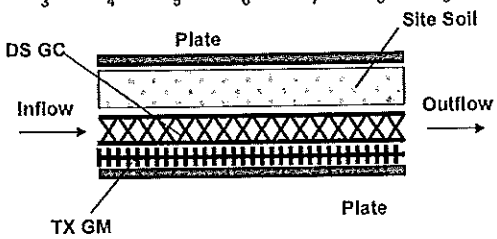

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1	2	3	MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)	533	532	531			
	Time (s)	30.04	30.03	30.00			
	Flow Rate (GPM/ft width)	0.28	0.28	0.28	0.28	0.00	
24	Transmissivity (m^2/s)	1.16E-03	1.16E-03	1.16E-03	1.16E-03	1.43E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510118
TRI Log #: E2348-58-08

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

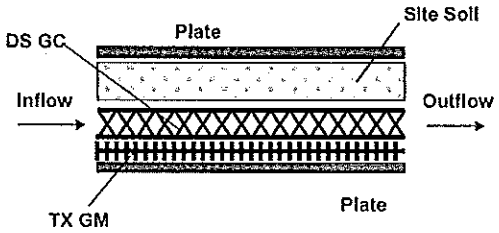

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1	2	3	MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)	626	611	610			
	Time (s)	60.30	60.30	60.40			
24	Flow Rate (GPM/ft width)	0.16	0.16	0.16	0.16	0.00	
	Transmissivity (m^2/s)	6.81E-04	6.65E-04	6.63E-04	6.70E-04	1.01E-05	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510172
TRI Log #: E2348-58-09

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

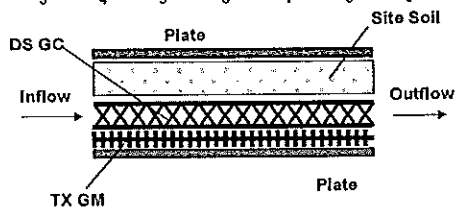

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1	2	3	MEAN	STD. DEV.	PROJ. SPEC.
24	Volume (cc)	529	522	528			
	Time (s)	60.40	60.21	60.32			
	Flow Rate (GPM/ft width)	0.14	0.14	0.14	0.14	0.00	
	Transmissivity (m^2/s)	5.75E-04	5.69E-04	5.72E-04	5.72E-04	2.92E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

MD Machine Direction TD Transverse Direction

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TRI / Environmental, Inc.
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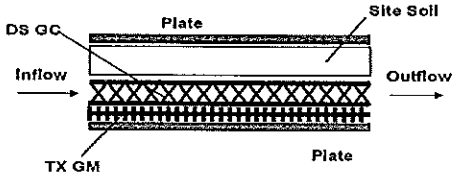
GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510181
TRI Log #: E2348-58-09

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)		Specimen	1										
	Volume (cc)		751	749	741								
	Time (s)		90.29	90.30	90.30								
24	Flow Rate (GPM/ft width)		0.13	0.13	0.13						0.13	0.00	
	Transmissivity (m^2/s)		5.46E-04	5.44E-04	5.38E-04						5.43E-04	3.87E-06	$5x10^{-4}$ min
	Test Temp (C)			20.0									
	Temp. Corr. Factor			1.000									

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510263
TRI Log #: E2348-58-09

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):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

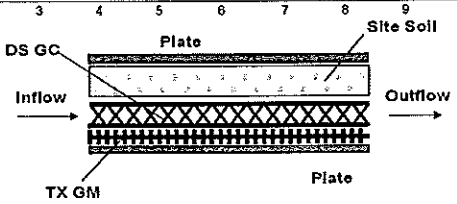

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)	Specimen	1			MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)	703	711	709			
	Time (s)	45.00	45.13	45.07			
24	Flow Rate (GPM/ft width)	0.25	0.25	0.25	0.25	0.00	
	Transmissivity (m^2/s)	1.03E-03	1.03E-03	1.03E-03	1.03E-03	4.63E-06	$5x10^{-4}$ min
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

MD Machine Direction TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: Republic Services
Project: Charlotte Motor Speedway

Material: SKAPS TN330-2-8 Double Sided Geocomposite
Sample Identification: 347510166
TRI Log #: E2348-58-08

RETEST

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

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.05
Test Length (in)	12
Test Width (in)	12

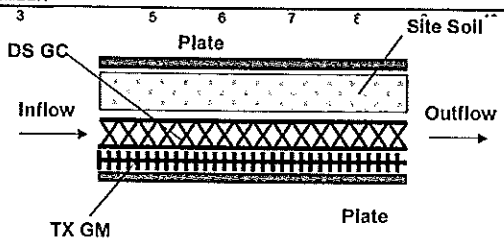

Plate / Site Soil / Sample / 60 mil MS HDPE GM / Plate

Seat Time (hours)		Specimen	1								
	Volume (cc)		529	526	527						
	Time (s)		60.41	60.33	60.36						
24	Flow Rate (GPM/ft width)		0.14	0.14	0.14				0.14	0.00	
	Transmissivity (m^2/s)		5.75E-04	5.72E-04	5.73E-04				5.73E-04	1.28E-06	$5x10^{-4}$ min
	Test Temp (C)			20.0							
	Temp. Corr. Factor			1.000							

MD Machine Direction TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

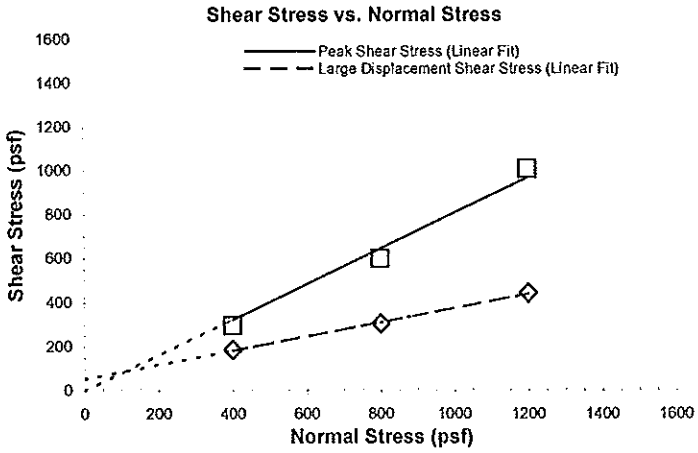
Interface Friction Test Report

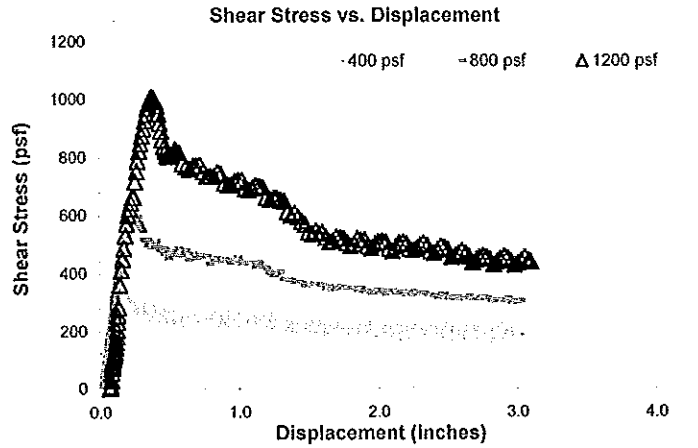
Client: **Atlantic Coast Consulting**
Project: **Republic-Charlotte Motor Speedway**
Test Date: 11/08/10-11/17/10

TRI Log#: E2347-27-04
Test Method: ASTM D 5321

John M. Allen, P.E., 11/17/2010
Quality Review/Date

Tested Interface: Skaps TN330-2-8 Double-sided Geocomposite (347510259) vs. Agru 60 mil HDPE Microspike Geomembrane (249338.09), Test 1 of 2





Test Results

	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	38.9	17.9
Y-intercept or Adhesion (psf):	0	54

Shearing occurred at the interface. The peak friction angle regression analysis was adjusted to fit a zero y-intercept.

Test Conditions

Upper Box & Skaps TN300-2-8 double-sided geocomposite

Lower Box Agru 60 mil HDPE Microspike geomembrane (dull side)

Box Dimensions: 12"x12"x4"

Interface Conditioning: Interface soaked and loading applied for a minimum of 1 hour prior to shear.

Test Condition: Wet

Shearing Rate: 0.2 inches/minute

Test Data

Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	3	3	19
Normal Stress (psf)	400	800	1200
Corrected Peak Shear Stress (psf)	296	599	1008
Corrected Large Displacement Shear Stress (psf)	186	306	444
Peak Secant Angle (degrees)	36.5	36.8	40.0
Large Displacement Secant Angle (degrees)	24.9	20.9	20.3
Asperity (mils)	30.2	31.0	26.0

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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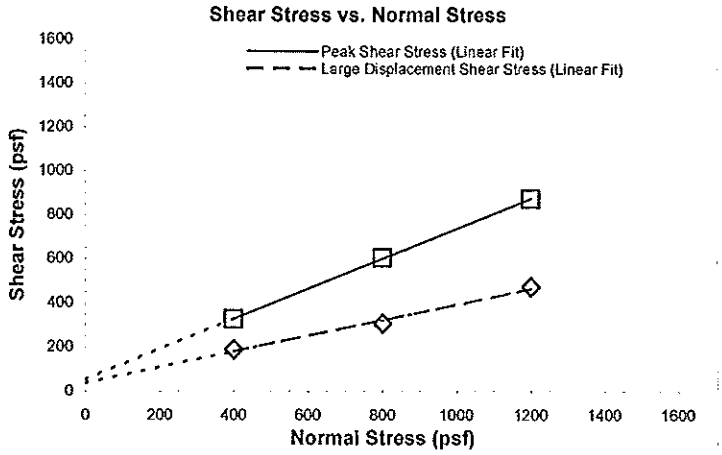
TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

Interface Friction Test Report

Client: **Atlantic Coast Consulting** TRI Log#: E2347-27-04
Project: **Republic-Charlotte Motor Speedway** Test Method: ASTM D 5321
Test Date: 11/09/10-11/17/10

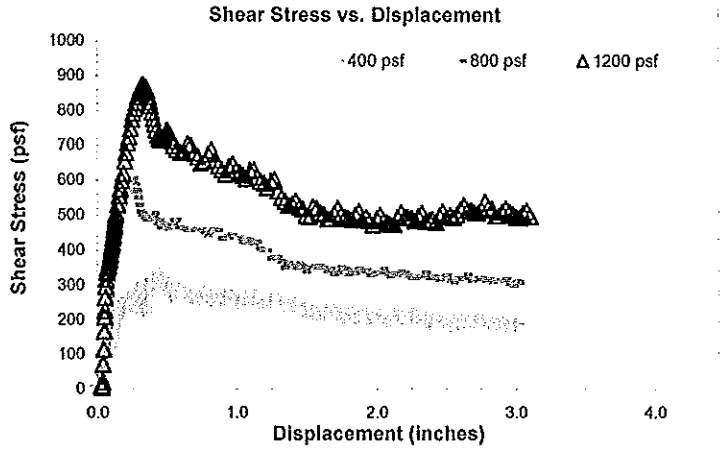
John M. Allen, P.E., 11/17/2010
Quality Review/Date

Tested Interface: Skaps TN330-2-8 Double-sided Geocomposite (347510284) vs. Agru 60 mil HDPE Microspike Geomembrane (24957609), Test 2 of 2



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	34.3	19.6
Y-intercept or Adhesion (psf):	55	39

Shearing occurred at the interface.



Test Conditions

Upper Box & Lower Box: Skaps TN300-2-8 double-sided geocomposite

Lower Box: Agru 60 mil HDPE Microspike geomembrane (dull side)

Box Dimensions: 12"x12"x4"

Interface Conditioning: Interface soaked and loading applied for a minimum of 1 hour prior to shear.

Test Condition: Wet

Shearing Rate: 0.2 inches/minute

Test Data

Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	3	3	19
Normal Stress (psf)	400	800	1200
Corrected Peak Shear Stress (psf)	326	604	873
Corrected Large Displacement Shear Stress (psf)	189	308	474
Peak Secant Angle (degrees)	39.2	37.1	36.0
Large Displacement Secant Angle (degrees)	25.3	21.1	21.6
Asperity (mils)	31.6	29.6	27.6

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TRI/ENVIRONMENTAL, INC.
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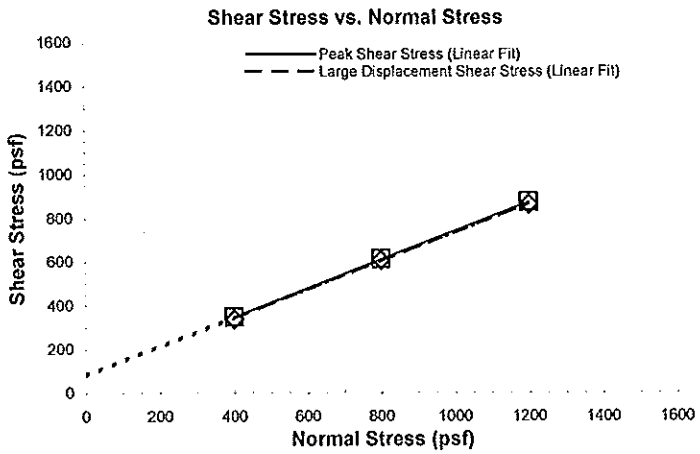
Interface Friction Test Report

Client: **Atlantic Coast Consulting** TRI Log#: E2347-27-04
Project: **Republic-Charlotte Motor Speedway** Test Method: ASTM D 5321
Test Date: 11/17/10-11/17/10

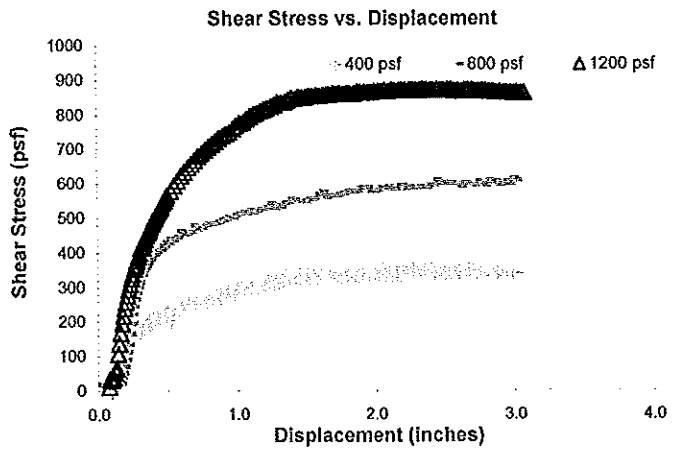
John M. Allen, P.E., 11/17/2010
Quality Review/Date

Tested Interface: Protective Cover Soil vs. Skaps TN330-2-8 Double-sided Geocomposite (347510284), Test 1 of 2



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	33.3	33.2
Y-intercept or Adhesion (psf):	87	79

Shearing occurred at the interface.



Test Conditions	
Upper Box &	Protective Cover Soil remolded to 82.2 pcf at 18.0% moisture content
Lower Box	Skaps TN300-2-8 double-sided geocomposite
Box Dimensions: 12"x12"x4"	
Interface Conditioning:	Interface soaked and loading applied for a minimum of 1 hour prior to shear.
Test Condition: Wet	
Shearing Rate: 0.04 inches/minute	

Test Data

Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	3	3	19
Normal Stress (psf)	400	800	1200
Corrected Peak Shear Stress (psf)	348	613	873
Corrected Large Displacement Shear Stress (psf)	339	608	863
Peak Secant Angle (degrees)	41.0	37.4	36.0
Large Displacement Secant Angle (degrees)	40.3	37.2	35.7

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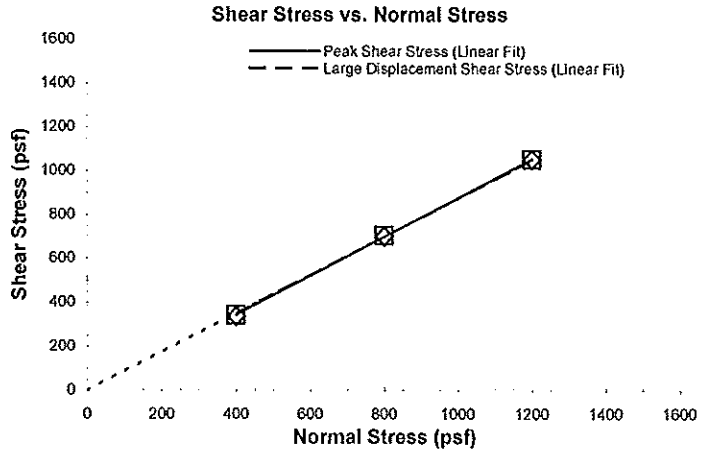
TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

Interface Friction Test Report

Client: **Atlantic Coast Consulting** TRI Log#: E2347-27-04
Project: **Republic-Charlotte Motor Speedway** Test Method: ASTM D 5321
Test Date: 11/17/10-11/17/10

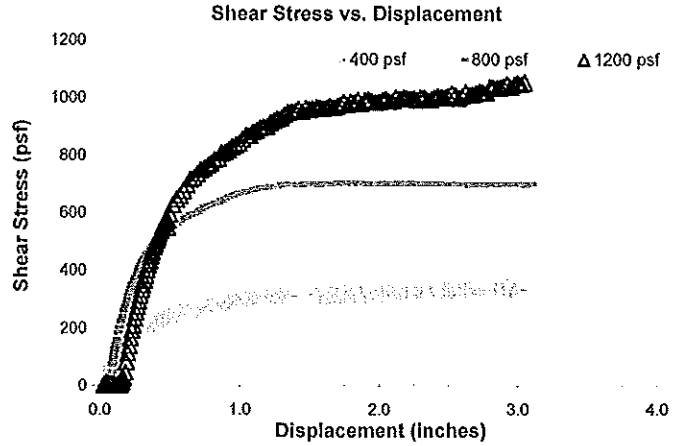
John M. Allen, P.E., 11/17/2010
Quality Review/Date

Tested Interface: Protective Cover Soil vs. Skaps TN330-2-8 Double-sided Geocomposite (347510259), Test 2 of 2



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	41.2	41.1
Y-intercept or Adhesion (psf):	0	0

Shearing occurred at the interface. Peak & large displacement friction angle regression analyses were adjusted to fit a zero y-intercept.



Test Conditions	
Upper Box &	Protective Cover Soil remolded to 82.2 pcf at 18.0% moisture content
Lower Box	Skaps TN300-2-8 double-sided geocomposite
Box Dimensions: 12"x12"x4"	
Interface Conditioning:	Interface soaked and loading applied for a minimum of 1 hour prior to shear.
Test Condition: Wet	
Shearing Rate: 0.04 inches/minute	

Test Data			
Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	3	3	19
Normal Stress (psf)	400	800	1200
Corrected Peak Shear Stress (psf)	342	704	1052
Corrected Large Displacement Shear Stress (psf)	337	700	1052
Peak Secant Angle (degrees)	40.5	41.3	41.2
Large Displacement Secant Angle (degrees)	40.1	41.2	41.2

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SKAPS Industries

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Republic Waste Services
Project Name : RWS Charlotte Motor Speedway, NC
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN330-2-8

We, the Geonet Manufacturer, hereby certify the following for the material delivered to the above referenced project:

Resin Supplier	Resin Production Plant	Resin Brand Name	Resin Lot Number	Property	Test Method	Units	Resin Supplier Value	Tested Value*
New South Polymers Inc	Chevron, TX	HDPE	4097-4	Density	ASTM D 1505	gm/cc	0.950	0.950
				Melt Flow Index	ASTM D 1238[a]	gm/10 min	0.10	0.10
			4106-1	Density	ASTM D 1505	gm/cc	0.950	0.950
				Melt Flow Index	ASTM D 1238[a]	gm/10 min	0.10	0.10

(a) Condition 190/2.16
* Data from SKAPS Quality Control

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **RWS Charlotte Motor Speedway, NC**

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL#	FABRIC ROLL#	WEIGHT oz/sq yd	MD TENSILE lbs.	MD ELONG %	XMD TENSILE lbs.	XMD ELONG %	MD TRAP lbs.	XMD TRAP lbs.	PUNCTURE lbs.	AOS us sieve	PERM-ITY sec^{-1}
347510001	3475.009	8.58	233	72	241	81	96	104	133	80	1.34
	3475.019	8.56	231	74	243	83	103	116	137	80	1.34
347510035	3475.018	8.56	231	74	243	83	103	116	137	80	1.34
	3475.010	8.11	225	68	234	75	103	116	137	80	1.34
347510070	3475.016	8.56	231	74	243	83	103	116	137	80	1.34
	3475.012	8.11	225	68	234	75	103	116	137	80	1.34
347510105	3475.046	8.50	234	75	244	84	95	106	135	80	1.34
	3475.033	8.17	226	67	238	80	105	110	139	80	1.34
347510140	3475.048	8.50	234	75	244	84	95	106	135	80	1.34
	3475.041	8.19	228	69	231	78	95	106	135	80	1.34
347510175	3475.080	8.27	229	65	235	79	100	103	132	80	1.38
	3475.057	8.48	232	71	241	82	102	118	137	80	1.38

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN330-2-8
Project : RWS Charlotte Motor Speedway, NC

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL#	FABRIC ROLL#	WEIGHT oz/sq yd	MD TENSILE lbs.	MD ELONG %	XMD TENSILE lbs.	XMD ELONG %	MD TRAP lbs.	XMD TRAP lbs.	PUNCTURE lbs.	AOS us sieve	PERM-ITY sec^{-1}
347510210	3475.058	8.48	232	71	241	82	102	118	137	80	1.38
	3475.073	8.25	227	70	239	77	104	120	134	80	1.38
347510245	3475.067	8.46	235	74	245	85	97	108	130	80	1.38
	3475.103	8.31	228	69	234	78	97	105	136	80	1.32
347510280	3475.092	8.29	226	67	232	76	102	117	138	80	1.38
	3475.095	8.40	230	73	244	82	102	117	138	80	1.38
347510315	3475.084	8.27	229	65	235	79	100	103	132	80	1.38
	3475.093	8.29	226	67	232	76	102	117	138	80	1.38

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

of NORTH CAROLINA, PLLC

SECTION I-3

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

December 8, 2010
Plastic Fusion
3455 Stanwood Blvd
Huntsville, AL 35811
PO : P13077
BOL : 20974

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)
CBR Puncture	ASTM D 6241	lbs (kN)	535 (2.39)
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 # ASTM METHOD UNITS TARGET	WEIGHT* D5261 oz/sq yd 8.00	MD TENSILE D4632 lbs. 205	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 205	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 85	XMD TRAP D4533 lbs 85	PUNCTURE D4833 lbs. 130	CBR D6241 lbs 535	AOS D4751 US Sieve 80	WATER FLOW D4491 gpm/ft^2 90	PERMITTIVITY D4491 sec^{-1} 1.40
420065753	7.56	206	63	228	78	87	106	134	686	80	112	1.49
420065754	7.56	206	63	228	78	87	106	134	686	80	112	1.49
420065755	8.45	212	70	234	84	87	106	134	686	80	112	1.49
420065756	8.45	212	70	234	84	87	106	134	686	80	112	1.49
420065757	8.45	212	70	234	84	87	106	134	686	80	112	1.49
420065758	8.45	212	70	234	84	87	106	134	686	80	112	1.49
420065759	8.45	212	70	234	84	87	106	134	686	80	112	1.49
420065760	7.71	208	65	225	76	91	112	137	688	80	112	1.49
420065761	7.71	208	65	225	76	91	112	137	688	80	112	1.49

RSW

*Weight is typical. All other values are MARV.

of NORTH CAROLINA, PLLC

APPENDIX J

Certificates of Acceptance of Soil Surface

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ESI

do hereby accept the area of soil surface bound by P-1 to P-19

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE
Sooligna Phinthisone ARIZONA		Supt	12/6/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Taylor Herberton		CQA	12/6/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Scott Callaway		CQA-PM	12/6/10

ATLANTIC COAST CONSULTING, INC

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: I001.154

GEOSYNTHETIC INSTALLER: ESI

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [signature]

I, the Undersigned, the duly authorized representative of ESI

do hereby accept the area of soil surface bound by panels P-20 to P-51

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
Soulignaphinh Sene	[signature]	Supt	12/7/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Taylor Herberkin	[signature]	CQA	12/7/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Scott Callaway	[signature]	CQA-PM	12/7/10

ATLANTIC COAST CONSULTING, INC

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: EST

REVIEWED BY:

I, the Undersigned, the duly authorized representative of EST

do hereby accept the area of soil surface bound by Panels P-52 to P-81

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
Sowugua Chinthisena		Supt	12/8/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Taylor Herberton		CQA	12/8/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Scott Callaway		CQA-PM	12/8/10

ATLANTIC COAST CONSULTING, INC

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

GEOSYNTHETIC INSTALLER: ESI

REVIEWED BY:

I, the Undersigned, the duly authorized representative of ESI

do hereby accept the area of soil surface bound by Panels P-82 to P-85

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
SooLigna Dhithisene		Supt	12/9/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Taylor Harbertson		CQA	12/9/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Scott Calloway		CQA-PM	12/9/10

ATLANTIC COAST CONSULTING, INC

CERTIFICATE OF ACCEPTANCE
OF SOIL SURFACE

PROJECT NUMBER: I001.154

GEOSYNTHETIC INSTALLER: ESI

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [signature]

I, the Undersigned, the duly authorized representative of ESI

do hereby accept the area of soil surface bound by Panels P-86 to 115

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
Sou Ligna Dhinthisene	[signature]	Supt	12/10/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Taylor Herbertson	[signature]	CQA	12/10/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Scott Callaway	[signature]	CQA PM	12/10/10

ATLANTIC COAST CONSULTING, INC

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: I001.154

GEOSYNTHETIC INSTALLER: EST

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [signature]

I, the Undersigned, the duly authorized representative of EST

do hereby accept the area of soil surface bound by P-116 to P-151

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
Souligna Phinthilene	[signature]	Supt	12/11/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Taylor Herbertson	[signature]	CQA	12/11/10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Scott Callaway	[signature]	CQA-PM	12/11/10

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX K

Panel Deployment Log

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12-6-10

DEPLOYMENT MONITOR(S): wp

REVIEWED BY: [illegible]

MATERIAL TYPE: 100 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	9692	408	Y	64	64	63	64	64	62	64	63	62	64												
2	P-2	"	408	Y	63	62	64	63	64	65	62	63	62	63												
3	P-3	9693	408	Y	64	64	63	63	62	63	62	61	63	64												
4	P-4	9691	408	Y	63	63	63	64	62	63	64	65	64	62												
5	P-5	9710	408	Y	64	64	63	64	63	64	63	64	63	64												
6	P-6	9574	406	Y	62	63	63	64	62	64	65	64	64	64												
7	P-7	9698	408	Y	63	63	62	63	64	64	63	63	63	64												
8	P-8	9575	406	Y	65	65	64	63	64	62	63	65	64	64												
9	P-9	9482	404	Y	63	63	64	63	63	63	64	63	63	64												
10	P-10	9695	408	Y	62	62	63	64	62	65	64	63	64	65												
11	P-11	9840	406	Y	65	64	64	64	63	63	63	62	63	64												
12	P-12	9467	406	Y	64	64	63	65	62	63	65	64	62	62												
13	P-13	9696	408	Y	62	62	63	62	63	62	63	62	62	62												
14	P-14	9586	406	Y	65	65	65	64	63	65	64	62	62	63												
15	P-15	9690	406	Y	64	64	65	63	64	63	65	64	63	63												
16	P-16	9708	406	Y	64	64	63	63	63	65	64	64	63	64												
17	P-17	9711	406	Y	62	62	62	62	64	63	65	64	63	63												
18	P-18	9697	404	Y	64	63	63	62	63	64	64	63	64	63												
19	P-19	9719	406	Y	62	66	65	63	64	62	64	63	64	62												
20																										
21																										
22																										
23																										
24																										
25																										

7726 x 22

total sq ft = 169,972

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12-7-10

DEPLOYMENT MONITOR(S): WP

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil HDPE

SHEET NUMBER: 1 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-20	9709	403	Y	63	62	63	64	63	64	63	63	62	63											
2	P-21	9569	403	Y	62	64	63	64	63	63	62	63	62	63											
3	P-22	9344	404	Y	64	64	63	64	62	63	64	65	62	64											
4	P-23	9603	406	Y	63	63	63	64	63	63	62	64	65	64											
5	P-24	9721	406	Y	62	63	64	64	63	64	65	62	63	65											
6	P-25	9340	403	Y	64	63	64	64	65	64	64	63	64	63											
7	P-26	9343	404	Y	65	64	63	63	62	63	64	65	64	63											
8	P-27	9721	405	Y	63	63	62	64	63	64	64	63	62	63											
9	P-28	9600	405	Y	62	63	62	64	64	64	63	64	65	63											
10	P-29	9334	403	Y	64	62	62	62	63	64	65	65	62	63											
11	P-30	9458	402	Y	63	63	65	64	63	64	64	64	63	64											
12	P-31	9346	402	Y	62	63	63	62	62	62	63	64	63	64											
13	P-32	9604	383	Y	64	64	65	64	65	64	64	63	64	65											
14	P-33	9576	370	Y	62	63	64	64	64	63	64	64	63	64											
15	P-35	4720	35	Y	63	64	63	62	65	64	63	62	63	62											
16	P-36	9720	44	Y	64	64	65	63	62	63	62	64	65	64											
17	P-37	9720	50	Y	63	63	63	62	63	62	63	62	64	63											
18	P-38	9720	57	Y	63	65	64	63	62	63	63	64	63	62											
19	P-39	9720	62	Y	64	64	63	62	63	62	64	63	62	63											
20	P-40	9720	63	Y	63	63	62	64	64	63	64	65	64	62											
21	P-41	9720	62	Y	62	63	64	63	63	64	63	64	63	62											
22	P-34	9347	404	Y	62	63	64	65	64	63	62	63	64	65											
23	P-42	9606	72	Y	63	63	64	63	62	63	64	63	64	63											
24	P-43	9606	93	Y	62	62	62	63	64	63	62	63	64	63											
25	P-44	9606	83	Y	63	63	63	62	63	64	63	64	62	64											

ATLANTIC COAST CONSULTING, INC

6,623

total = 166,965 sq. ft.

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12-7

DEPLOYMENT MONITOR(S): WP

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil HDPE

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-45	9606	85	Y	62	62	63	62	61	63	64	63	62	64											
2	P-46	9568	80	Y	64	64	63	64	64	63	64	62	63	64											
3	P-47	9568	86	Y	63	64	63	62	64	62	65	64	63	64											
4	P-48	9569	34	Y	64	64	63	62	63	64	63	64	64	62											
5	P-49	9569	55	Y	62	62	63	62	63	64	63	63	64	63											
6	P-50	9569	65	Y	65	64	62	62	63	63	64	62	63	63											
7	P-51	9688	40	Y	64	63	63	64	63	63	64	64	63	64											
8																									
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25																									

7,418 x 22.5

total = 166,705 sq ft

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

MATERIAL TYPE: 60 Mill HDPE

DATE OF DEPLOYMENT: 12-8-10

DEPLOYMENT MONITOR(S): WP

REVIEWED BY: [illegible]

SHEET NUMBER: 1 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-52	9573	407	Y	62	63	63	63	64	64	63	62	63	62											
2	P-53	9723	408	Y	64	64	63	64	65	63	63	62	64	65											
3	P-54	9601	408	Y	62	62	63	63	64	63	63	62	64	63											
4	P-55	9699	408	Y	63	63	64	64	64	64	64	65	62	64											
5	P-56	9579	406	Y	63	64	64	65	63	63	64	63	63	64											
6	P-57	9674	407	Y	64	63	64	65	63	63	62	63	65	63											
7	P-58	9457	410	Y	62	62	63	64	63	65	64	63	64	63											
8	P-59	9338	406	Y	65	64	65	63	64	63	64	63	63	63											
9	P-60	9440	408	Y	64	63	63	64	63	65	63	64	64	63											
10	P-61	9342	382	Y	62	63	62	64	63	61	63	63	62	63											
11	P-62	9582	373	Y	63	63	63	64	63	63	62	62	63	62											
12	P-63	9345	364	Y	62	62	64	63	65	63	65	64	63	63											
13	P-64	9605	355	Y	63	63	62	63	64	63	62	63	64	64											
14	P-65	9724	343	Y	64	64	63	64	63	63	62	64	63	63											
15	P-66	9454	294	Y	63	62	62	63	63	64	63	62	62	62											
16	P-67	9728	287	Y	62	62	63	64	63	64	63	63	64	63											
17	P-68	9728	78	Y	63	63	64	64	63	64	63	63	64	64											
18	P-69	9341	70	Y	62	62	63	63	64	63	62	64	63	64											
19	P-70	9341	60	Y	62	62	63	63	63	64	64	63	64	64											
20	P-71	9341	50	Y	63	63	64	63	64	62	61	62	63	64											
21	P-72	9341	50	Y	63	62	62	63	63	64	63	64	63	62											
22	P-73	9341	50	Y	64	64	63	63	64	63	63	64	62	64											
23	P-74	9341	50	Y	63	63	63	64	65	64	62	63	63	62											
24	P-75	9341	50	Y	62	62	63	64	63	63	64	64	63	62											
25	P-76	9455	56	Y	63	63	64	63	64	64	63	64	63	63											

6580x22

144,760 sq ft.

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12-8-10

DEPLOYMENT MONITOR(S): wp

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil HDPE

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-77	9455	88	Y	63	63	64	63	64	64	63	62	62	63											
2	P-78	9455	89	Y	63	63	63	62	63	64	64	63	63	64											
3	P-79	9455	89	Y	63	63	64	64	64	64	62	62	63	64											
4	P-80	9724	66	Y	63	64	64	63	64	64	62	62	62	63											
5	P-81	9605	54	Y	62	62	63	64	64	65	63	64	64	63											
6																									
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386 x 22

8492 sq. ft

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12-9-10

DEPLOYMENT MONITOR(S): WP

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil 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-82	9583	129	Y	62	62	63	62	64	64	63	63	63	63											
2	P-83	9454	163	Y	63	64	63	62	61	62	63	64	63	64											
3	P-84	9583	275	Y	62	62	62	64	63	62	63	64	63	62											
4	P-85	9454	10	Y	63	63	64	63	62	62	64	63	64	65											
5																									
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ATLANTIC COAST CONSULTING, INC

577 x 22

12694 sq. ft.

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12/10/10

DEPLOYMENT MONITOR(S): WP

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil HDPE

SHEET NUMBER: 1 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-86	9717	408	Y	62	62	63	63	64	61	63	62	63	63											
2	P-87	9570	409	Y	64	64	64	63	64	63	63	62	62	63											
3	P-88	9572	406	Y	61	62	61	62	63	65	66	65	64	64											
4	P-89	9337	400	Y	63	62	61	61	62	64	63	62	62	63											
5	P-90	9571	409	Y	64	64	64	64	63	63	63	62	63	63											
6	P-91	9450	408	Y	63	63	62	63	62	65	66	65	65	64											
7	P-92	9587	217	Y	64	63	64	64	61	62	63	63	63	64											
8	P-93	9587	203	Y	62	63	62	63	63	63	64	63	64	65											
9	P-94	9449	197	Y	63	62	63	63	63	64	64	65	64	63											
10	P-95	9444	186	Y	64	65	66	65	64	63	63	63	63	62											
11	P-96	9713	178	Y	63	62	62	63	62	63	64	64	64	64											
12	P-97	9713	169	Y	61	62	63	63	63	64	63	62	63	62											
13	P-98	9713	25	Y	61	61	63	62	63	62	63	62	63	65											
14	P-99	9456	164	Y	63	62	62	63	64	64	64	64	63	62											
15	P-100	9456	161	Y	64	64	62	63	63	64	65	65	64	65											
16	P-101	9584	155	Y	66	65	64	65	66	65	66	65	64	63											
17	P-102	9584	146	Y	64	63	63	63	64	65	64	64	64	64											
18	P-103	9584	164	Y	63	63	62	63	62	65	66	65	66	66											
19	P-104	9714	164	Y	62	63	62	61	62	65	64	64	64	64											
20	P-105	9714	119	Y	64	63	63	63	62	65	66	65	64	64											
21	P-106	9714	114	Y	63	63	64	64	64	66	66	65	64	64											
22	P-107	9456	34	Y	63	64	64	65	64	65	66	65	64	64											
23	P-108	9585	103	Y	63	64	63	63	63	62	61	62	61	61											
24	P-109	9585	94	X	62	63	64	63	63	64	65	64	64	63											
25	P-110	9585	88	Y	62	63	64	64	65	65	64	64	64	65											

5,005 x 22

110,110 sq. ft.

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12/10/10

DEPLOYMENT MONITOR(S): WP

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil HDPE

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-111	9461	42	Y	61	62	63	63	63	61	62	63	63	62											
2	P-112	9461	100	Y	63	63	64	64	64	65	65	64	65	66											
3	P-113	9595	100	Y	64	63	62	61	62	62	63	64	65	65											
4	P-114	9581	34.41	Y	64	64	64	63	64	66	65	64	64	64											
5	P-115	9585	11	Y	63	62	63	63	64	65	65	65	64	64											
6																									
7																									
8																									
9																									
10																									
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18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									

5,602 x 22

123,244 sq. ft

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12-11-10

DEPLOYMENT MONITOR(S): TS / RTH

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil textured HDPE

SHEET NUMBER: 1 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-116	9580	164	Y	64	63	63	62	63	65	66	65	64	64											
2	P-117	9580	161	Y	63	63	63	63	64	62	63	64	64	65											
3	P-118	9580	81	Y	62	62	63	64	63	62	63	64	64	64											
4	P-119	9725	82	Y	65	64	64	63	63	66	65	64	64	63											
5	P-120	9725	205	Y	63	63	62	64	63	63	63	64	63	63											
6	P-121	9577	204	Y	63	64	63	63	63	64	65	64	64	63											
7	P-122	9577	200	Y	62	63	64	64	63	62	63	64	63	62											
8	P-123	9602	200	Y	62	63	64	64	63	62	63	63	63	63											
9	P-124	9602	200	Y	64	64	64	63	63	62	63	64	64	63											
10	P-125	9461	198	Y	62	62	63	63	64	66	65	64	64	64											
11	P-126	9722	200	Y	63	64	63	62	63	65	64	63	62	62											
12	P-127	9722	200	Y	63	64	65	64	63	62	63	64	63	63											
13	P-128	9715	206	Y	65	65	64	64	64	62	61	62	63	63											
14	P-129	9715	80	Y	64	64	63	63	62	63	63	64	64	63											
15	P-130	9715	56	Y	65	64	63	63	62	63	64	65	65	65											
16	P-131	9715	68	Y	62	63	63	62	63	63	63	65	64	63											
17	P-132	9761	85	Y	63	62	61	64	63	63	62	63	64	64											
18	P-133	9725	106	Y	64	64	65	65	65	64	63	62	61	63											
19	P-134	9689	120	Y	63	64	63	62	63	62	64	63	63	63											
20	P-135	9689	130	Y	64	63	63	63	64	65	64	64	65	66											
21	P-136	9689	130	Y	65	64	63	63	62	62	64	63	63	63											
22	P-137	9716	26	Y	63	64	63	62	63	64	64	63	63	63											
23	P-138	9716	168	Y	63	64	64	63	63	63	63	64	63	64											
24	P-139	9716	181	Y	63	64	63	62	63	63	64	64	64	63											
25	P-140	9459	195	Y	63	64	64	63	62	62	63	63	64	63											

3604 x 22

79,288 sq ft.

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE PANEL DEPLOYMENT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF DEPLOYMENT: 12/11/10

DEPLOYMENT MONITOR(S): RTH/TS

REVIEWED BY: [illegible]

MATERIAL TYPE: 60 mil textured HDPE

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-141	9459	161	Y	64	63	63	64	63	62	62	63	64	63											
2	P-142	9459	33	Y	64	63	64	63	62	65	64	63	62	63											
3	P-143	1115	92	Y	64	65	64	65	65	66	65	65	66	65											
4	P-144	1115	115	Y	64	63	63	65	64	65	64	64	65	65											
5	P-145	1115	92	Y	65	65	64	64	63	64	63	63	64	64											
6	P-146	1115	94	Y	64	65	66	65	65	64	64	63	64	64											
7	P-147	1113	88	Y	65	64	64	63	64	65	64	64	63	63											
8	P-148	1113	305	Y	64	63	64	64	63	62	63	64	64	64											
9	P-149	1113	294	Y	64	63	63	63	63	62	63	64	64	63											
10	P-150	1227	126	Y	65	65	64	63	62	62	63	64	64	64											
11	P-151	1227	130	Y	64	64	65	65	64	63	63	62	63	64											
12																									
13																									
14																									
15																									
16																									
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18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									

1530 x 22

336660 sq. ft.

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX L

Trial Seam Logs

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/6/10

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			OUTSIDE PEEL STRENGTH/MODE			SHEAR STRENGTH/MODE			PASS OR FAIL	CQA MONITOR'S INITIALS	REMARKS OR COMMENTS
							1	2	3	1	2	3	1	2	3			
TF-1	1125	1219	SP	33°	6.0	860	141	131	123	141	149	130	200	202	201	P	RTH	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-2	1130	1218	BV	"	6.0	860	115	113	138	118	116	129	220	219	221	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-3	1138	1220	MK	"	6.0	860	150	151	158	147	150	151	200	206	204	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-4	1320	0721	JN	34°	6.0	860	130	133	151	128	126	147	201	203	200	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/7/10

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: 1of

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	0814	0721	JN	33°	6.0	860	138	118	128	123	130	119	210	208	207	P	RTH	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-2	0817	1218	BV	"	6.0	"	120	127	130	137	129	128	206	205	207	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-1	0820	5382	AZ	"	N/A	550/550	151	152	152				205	204	205	P	"	
							SE	SE	SE				BRK	BRK	BRK			
TF-3	0825	1220	MK	"	6.0	860	130	135	134	134	115	120	206	205	207	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-4	0830	1219	SP	"	6.0	"	112	107	110	125	125	120	185	187	186	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-5	1320	1218	BV	36°	6.0	"	127	120	128	131	129	132	192	195	194	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-6	1325	0721	JN	"	6.0	"	125	128	118	113	146	127	202	200	201	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-2	1330	5382	AZ	"	N/A	550/550	178	183	171				215	216	220	P	"	
							SE	SE	SE				BRK	BRK	BRK			
TF-7	1335	1219	SP	"	6.0	860	133	135	120	129	127	118	200	201	200	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-8	1340	1220	MK	"	6.0	860	130	131	129	128	127	130	205	207	204	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/8/16

TF - # = FUSION SEAM: ✓

TX - # = EXTRUSION SEAM: ✓

REVIEWED BY: [illegible]

SHEET NUMBER: lot 1

SAMPLE NUMBER	APPROX. TIME	WELDING MACHINE NUMBER	WELDING TECH.	AMBIENT AIR TEMP.	MACHINE SPEED	TEMP. SETTING	INSIDE PEEL STRENGTH/MODE			OUTSIDE PEEL STRENGTH/MODE			SHEAR STRENGTH/MODE			PASS OR FAIL	CQA MONITOR'S INITIALS	REMARKS OR COMMENTS
							1	2	3	1	2	3	1	2	3			
TX-1	0700	5382	AZ	33°	N/A	550/550	163	170	167				211	216	215	P	RTH	T/T
							SE	SE	SE				BRK	BRK	BRK			
TF-1	0715	1219	SP	"	6.0	860	118	120	115	121	124	116	192	194	195	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-2	0720	0721	MK	"	"	860	115	118	122	113	121	120	197	194	196	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-3	1250	1219	SP	37°	"	860	141	167	140	138	175	162	199	201	202	P	"	S/T
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-4	1230	1220	VP	"	"	860	120	127	130	118	126	128	200	199	202	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-2	1235	5382	AZ	"	N/A	550/550	170	168	166				209	208	209	P	"	T/T
							SE	SE	SE				BRK	BRK	BRK			
TF-5	1240	1219	MK	"	6.0	860	132	128	120	130	124	122	198	195	197	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12-9-10

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	800	721	MK	33	6	860	149	141	137	145	171	150	245	240	237	P	WP	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-2	805	1219	SP	33	6	860	162	145	142	151	141	151	256	204	252	P	WP	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-3	810	1219	SP	33	4	860	142	149	144	155	148	154	220	215	213	P	WP	T/T
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-4	815	721	MK	33	4	860	140	148	145	149	156	160	222	220	218	P	WP	T/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-1	820	5382	BS	33	N/A	550/550	175	177	170				235	240	237	P	WP	
							SE	SE	SE				BRK	BRK	BRK			
TX-2	1520	29	IS	35	N/A	550/550	175	175	180				230	235	240	P	RTH	
							SE	SE	SE				BRK	BRK	BRK			

ATLANTIC COAS[illegible] ONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/10/10

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	0730	5382	BS	34°	N/A	550/550	162	185	181				225	227	224	P	RTH	
							SE	SE	SE				BRK	BRK	BRK			
TF-1	1230	0721	MK	41°	6.0	860°	135	138	130	133	123	125	205	207	208	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-2	1225	1219	SP	"	6.0	860°	122	129	125	138	133	137	203	150	200	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-2	1230	5382	BS	"	N/A	550/550	169	172	168				220	225	223	P	"	
							SE	SE	SE				BRK	BRK	BRK			
TF-3	1235	1218	BV	"	6.0	860°	125	138	127	137	135	138	196	198	200	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-4	1245	1220	VP	"	6.0	860°	126	119	125	122	123	128	197	195	194	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-5	1330	1220	VP	44°	6.0	860°	162	154	160	153	168	159	187	190	189	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-6	1335	1219	SP	"	6.0	860°	148	150	155	154	161	164	190	192	188	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-7	1345	0721	MK	"	6.0	860°	142	153	154	143	156	146	200	201	197	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-8	1400	1220	VP	45°	6.0	860°	172	162	160	151	165	170	202	200	198	P	"	
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2l

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/10/10

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	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-3	1347	5382	BS	40°	N/A	550/450	138	142	144			✓	204	207	205	P	RTH	
							SE	SE	SE	✓			BRK	BRK	BRK			
TX-4	1350	503	IS	"	N/A	550/450	128	130	132			✓	197	200	204	P	"	
							SE	SE	SE	✓			BRK	BRK	BRK			

ATLANTIC COAS[illegible] ONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/11/2010

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
TF-1	0715	1218	BV	38°	6.0	860	145	137	149	148	146	154	199	200	201	P	RTH	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-2	0720	1219	SP	"	"	"	125	130	135	122	128	148	198	196	199	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-3	0725	0721	MK	"	"	"	132	135	138	139	142	150	202	203	200	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-4	0730	1220	VP	"	"	"	128	134	138	132	130	147	200	196	195	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-5	0735	1218	BV	"	4.0	"	145	140	150	152	148	159	204	200	201	P	"	T/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-6	0736	1219	SP	"	"	"	140	143	148	144	147	154	200	198	197	P	"	T/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-7	0740	0721	MK	"	"	"	143	142	140	144	147	145	198	200	201	P	"	T/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-8	0745	1220	VP	"	"	"	148	149	150	132	141	158	196	195	197	P	"	T/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-9	0737	1218	BV	"	"	"	161	168	161	168	170	167	203	204	205	P	"	T/T
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-10	0733	1219	SP	"	"	"	179	160	160	168	162	164	206	210	208	P	"	T/T
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2l

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/11/10

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-11	0730	0721	MK	38°	4.0	860°	152	160	157	158	164	166	210	208	211	P	RTH	T/T
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-12	0738	1220	VP	"	"	"	149	167	150	151	160	158	199	203	201	P	"	T/T
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-1	0710	503	IS.	"	N/A	550/550	143	148	150				215	220	221	P	"	T/T
							SE	SE	SE				BRK	BRK	BRK			
TX-2	0715	5382	BS.	"	N/A	550/-/550	149	138	140				210	202	208	P	"	T/T
							SE	SE	SE				BRK	BRK	BRK			
TF-13	1205	1218	BV	42°	6.0	860°	135	150	148	140	135	150	200	201	199	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-14	1210	1219	SP	"	"	"	142	148	137	149	137	142	198	202	200	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-15	1215	0721	MK	"	"	"	147	147	145	136	136	135	201	199	198	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TF-16	1220	1220	VP	"	"	"	140	138	137	135	134	143	194	199	201	P	"	S/S
							SE	SE	SE	SE	SE	SE	BRK	BRK	BRK			
TX-3	1210	503	IS	"	N/A	550/550	150	149	147				220	218	217	P	"	T/T
							SE	SE	SE				BRK	BRK	BRK			
TX-4	1213	5382	BS	"	N/A	550/550	143	142	144				205	209	212	P	"	T/T
							SE	SE	SE				BRK	BRK	BRK			

ATLANTIC COAST[illegible]ONSULTING, INC

GEOMEMBRANE TRIAL SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF TRIAL SEAM: 12/13/10

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			OUTSIDE PEEL STRENGTH/MODE			SHEAR STRENGTH/MODE			PASS OR FAIL	CQA MONITOR'S INITIALS	REMARKS OR COMMENTS
							1	2	3	1	2	3	1	2	3			
TX-1	0720	502	IS	38°	N/A	550/550	142	148	145				220	215	217	P	RTH	
							SE	SE	SE				BRK	BRK	BRK			
TX-2	0725	5382	BS	"	"	"	158	153	154				218	215	222	P	"	
							SE	SE	SE				BRK	BRK	BRK			
TX-3	1320	5382	BS	42°	"	"	144	140	147				210	212	216	P	"	
							SE	SE	SE				BRK	BRK	BRK			
TX-4	1325	502	IS	"	"	"	142	147	145				219	217	215	P	"	
							SE	SE	SE				BRK	BRK	BRK			

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX M

Seam Logs

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/6/10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1220

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 0

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-3	P-4	NEOS	SEOS	1157	MK	6.0	860	410	100/310	DS-3	RTH		12/6	RTH
2	P-6	P-7	NEOS	SEOS	1308	"	"	"	410	480/240	DS-5	"		12/6	"
3	P-10	P-11	NEOS	SEOS	1419	"	"	"	408	480/168	DS-10	"		12/6	"
4	P-12	P-13	NEOS	SEOS	1518	"	"	"	408	480/96	DS-12	"		12/6	"
5	P-16	P-17	NEOS	SEOS	1627	"	"	"	408	480/24	DS-18	"		12/6	"
6															
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22															

DAILY TOTAL FOR WELDED SEAM: 2044

DESTRUCTIVE LENGTH CARRY - OVER: 24

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/6/10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 0721

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 0

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-7	P-8	NEOS	SEOS	1330	JN	6.0	860°	408	100/308	DS-7	RTH		12/6	RTH
2	P-11	P-12	NEOS	SEOS	1425	"	"	"	408	480/236	DS-11	RTH		12/6	"
3	P-14	P-15	NEOS	SEOS	1533	"	"	"	405	480/161	DS-14	"		12/6	"
4	P-17	P-18	NEOS	SEOS	16:00	"	"	"	404	480/85	DS-19	"		12/6	"
5															
6															
7															
8															
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22															

DAILY TOTAL FOR WELDED SEAM: 1625

DESTRUCTIVE LENGTH CARRY - OVER: 85

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-6-10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1219

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 0

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	1	2	NEOS	SEOS	1146	SP	6.0	860	408	100/308	DS-1	wp		12/7	RTH
2	4	5	NEOS	SEOS	1307	SP	6.0	860	408	480/236	DS-4	wp		12/7	"
3	9	10	NEOS	SEOS	1416	SP	6.0	860	408	480/164	DS-9	wp		12/7	"
4	13	14	NEOS	SEOS	1528	SP	6.0	860	408	480/42	DS-13	wp		12/7	"
5	10	T-I	IN	WEOS	1625	"	"	"	7	993				12/7	"
6	9	TI	EEOS	WEOS	1630	"	"	"	22	121				12/7	"
7	8	TI	EEOS	WEOS	1635	"	"	"	22	143				12/7	"
8	7	TI	EEOS	IN	1639	"	"	"	13	156				12/7	"
9	7	TI	IN	WEOS	1647	"	"	"	8	161				12/7	"
10	6	TI	EEOS	WEOS	1643	"	"	"	22	186				12/7	"
11	5	TI	EEOS	WEOS	1646	"	"	"	22	208				12/7	"
12	4	TI	EEOS	WEOS	1649	"	"	"	22	230				12/7	"
13	3	TI	EEOS	WEOS	1655	"	"	"	22	252				12/7	"
14	2	TI	EEOS	WEOS	1658	"	"	"	22	274				12/7	"
15	19	TI	EEOS	WEOS	1710	"	"	"	5	279				12/7	"
16	18	TI	EEOS	WEOS	1715	"	"	"	17	296				12/7	"
17	17	TI	EEOS	WEOS	1717	"	"	"	17	313				12/7	"
18	16	TI	EEOS	WEOS	1720	"	"	"	17	330				12/7	"
19	15	TI	EEOS	WEOS	1722	"	"	"	17	347				12/7	"
20	14	TI	EEOS	WEOS	1725	"	"	"	17	364				12/7	"
21	13	TI	EEOS	WEOS	1728	"	"	"	17	381				12/7	"
22	12	TI	EEOS	WEOS	1730	"	"	"	17	398				12/7	"

DAILY TOTAL FOR WELDED SEAM: 1938

DESTRUCTIVE LENGTH CARRY - OVER: 398

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-6-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 398

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	11	TI	EEOS	WEOS	1733	SP	6.0	860	17	415				12/7	RTH
2	10	TI	EEOS	M	1738	SP	6.0	860	15	430				12/7	"
3															
4															
5															
6															
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17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 32

DESTRUCTIVE LENGTH CARRY - OVER: 430

ATLANTIC COA CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-6-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY: [illegible]

MACHINE NUMBER: 1218

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: Q

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	2	3	NEOS	SEOS	1142	BV	6.0	860	408	100 ~~100~~	DS-2	up		12/6	RJH
2	5	6	NEOS	SEOS	1256	BV	6.0	860	406	480/234	DS-6	up		12/6	"
3	8	9	NEOS	SEOS	1356	BV	6.0	860	404	480/158	DS-8	up		12/6	"
4	15	16	NEOS	SEOS	1547	BV	6.0	860	406	480/84	DS-15	up		12/6	"
5	18	19	NEOS	SEOS	1650	BV	6.0	860	404	480/8	DS-16	up		12/6	"
6															
7															
8															
9															
10															
11															
12															
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15															
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18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 2028

DESTRUCTIVE LENGTH CARRY - OVER: 8

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-7-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 430

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	COA MONITOR INITIALS	REMARKS	NON-DESTRUCTIVE	
	FIRST PANEL	SECOND PANEL	START POINT	FINISH POINT										TEST DATE	COA MONITOR
1	P-22	P-23	NEOS	SEOS	922	SP	5.0	860	404	480/354	DS-17	wp		12/7	RTH
2	P-25	P-26	NEOS	SEOS	1025	"	"	"	403	480/277	DS-22	wp		12/7	"
3	P-28	P-29	NEOS	SEOS	1338	"	"	"	403	480/200	DS-26	wp		12/7	"
4	P-32	P-33	NEOS	SEOS	1446	"	"	"	379	480/99	DS-30	"		12/7	"
5	P-34	TI	EEOS	WEOS	1613	"	"	"	10	109		RTH		12/9	"
6	P-33	TI	EEOS	WEOS	1615	"	"	"	22	131		"		12/9	"
7	P-32	TI	EEOS	WEOS	1622	"	"	"	22	153		"		12/9	"
8	P-31	TI	EEOS	WEOS	1625	"	"	"	22	175		"		12/9	"
9	P-30	TI	EEOS	WEOS	1629	"	"	"	22	197		"		12/9	"
10	P-29	TI	EEOS	WEOS	1632	"	"	"	22	219		"		12/9	"
11	P-28	TI	EEOS	WEOS	1636	"	"	"	22	241		"		12/9	"
12	P-34	51	NEOS	SEOS	1658	"	"	"	408	480/169	DS-34	"		12/8	RTH
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 2139

DESTRUCTIVE LENGTH CARRY - OVER: 169

ATLANTIC COA CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-7-10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 0721

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 85

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-20	P-21	NEOS	SEOS	848	JN	6.0	860	404	480/9	DS-20	wp		12-7	wp
2	P-23	P-24	NEOS	SEOS	952	"	"	"	406	415		wp		12-7	wp
3	P-26	P-27	NEOS	SEOS	1105	"	"	"	403	480/338	DS-23	wp		12-7	WP
4	P-29	P-30	NEOS	SEOS	1344	"	"	"	402	480/260	DS-27	wp		12-7	wp
5	P-33	P-34	NEOS	SEOS	1452	"	"	"	404	480/184	DS-31	wp		12-7	wp
6	P-40	P-41	EEOS	WEOS	1555	"	"	"	63	247		wp		12/8	RTH
7	P-42	P-43	EEOS	WEOS	1607	"	"	"	72	319		wp		12/8	"
8	P-44	P-45	EEOS	WEOS	1614	"	"	"	85	404		wp		12/8	"
9	P-45	P-46	EEOS	WEOS	1635	"	"	"	80	480/4	DS-33	wp		12/8	"
10	P-48	P-49	EEOS	WEOS	1650	"	"	"	34	38		wp		12/8	"
11	P-49	P-50	EEOS	WEOS	1707	"	"	"	55	93		wp		12/8	"
12	P-46	P-47	EEOS	WEOS	1710	"	"	"	87	180		wp		12/8	"
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 2408

DESTRUCTIVE LENGTH CARRY - OVER: 180

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-7-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1220

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 24

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-21	P-22	NEOS	SEOS	900	MK	6.0	860	403	427		wp		12-7	wp
2	P-27	TI	EEOS	4X	1134	"	"	"	17	444		wp		12-7	wp
3	P-27	TI	4X	WEOS	1139	"	"	"	5	449		wp		12-7	wp
4	P-26	TI	EEOS	4V	1140	"	"	"	17	466		wp		12-7	wp
5	P-26	TI	4V	WEOS	1141	"	"	"	5	471		wp		12-7	wp
6	P-25	TI	EEOS	4S	1142	"	"	"	17	480/8	DS-25	wp		12-7	wp
7	P-25	TI	4S	WEOS	1143	"	"	"	5	13		wp		12-7	wp
8	P-24	TI	EEOS	4Q	1145	"	"	"	17	30		wp		12/9	RTH
9	P-24	TI	4Q	WEOS	1147	"	"	"	5	35		wp		12/9	"
10	P-23	TI	EEOS	4N	1148	"	"	"	17	52		wp		12/9	"
11	P-23	TI	4N	WEOS	1150	"	"	"	5	57		wp		12/9	"
12	P-22	TI	EEOS	4K	1151	"	"	"	17	74		wp		12/9	"
13	P-22	TI	4K	WEOS	1200	"	"	"	5	79		wp		12/9	"
14	P-21	TI	EEOS	4I	1329	"	"	"	17	96		wp		12/9	"
15	P-21	TI	4I	WEOS	1330	"	"	"	5	101		wp		12/9	"
16	P-20	TI	EEOS	4G	1332	"	"	"	17	118		wp		12/9	"
17	P-20	TI	4G	WEOS	1335	"	"	"	5	123		wp		12/9	"
18	P-30	P-31	NEOS	SEOS	1359	"	"	"	402	480/45	DS-28	wp		12-7	wp
19	P-51	P-35	NEOS	SEOS	1701	"	"	"	22	67		wp		12/8	RTH
20	P-51	P-36	NEOS	SEOS	1705	"	"	"	22	89		wp		12/8	"
21	P-51	P-37	NEOS	SEOS	1710	"	"	"	22	111		wp		12/8	"
22	P-51	P-38	NEOS	SEOS	1713	"	"	"	22	133		wp		12/8	"

DAILY TOTAL FOR WELDED SEAM: 1064

DESTRUCTIVE LENGTH CARRY - OVER: 133

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-7

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1220

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 133

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	D-51	P-39	NEW	SEW	1718	MK	6.0	560	22	155		wp		12/8	RTH
2	P-51	P-40	NEW	SEW	1722	"	6.0	560	22	177		wp		12/8	"
3	P-41	P-51	NEW	SEW	1725	"	"	"	22	199		wp		12/8	"
4	P-42	P-51	NEW	SEW	1728	"	"	"	22	221		wp		12/8	"
5	P-43	P-51	NEW	SEW	1731	"	"	"	22	243		wp		12/8	"
6															
7															
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21															
22															

DAILY TOTAL FOR WELDED SEAM: 110

DESTRUCTIVE LENGTH CARRY - OVER: 243

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-7-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1218

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 8

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-19	P-20	NEOS	SEOS	857	BV	6.0	860	403	411		wp		12/7	RTH
2	P-24	P-25	NEOS	SEOS	1007	"	"	"	403	490/324	DS-21	wp		12/7	"
3	P-27	P-28	NEOS	SEOS	1100	"	"	"	405	490/244	DS-24	wp		12/7	"
4	P-31	P-32	NEOS	SEOS	1412	"	"	"	383	490/152	DS-24	wp		12/7	"
5	P-33	P-36	WEOS C	EEOS	1522	"	"	"	35	197		wp		12/7	"
6	P-36	P-37	WEOS C	EEOS	1530	"	"	"	44	23		wp		12/7	"
7	P-37	P-38	WEOS C	EEOS	1537	"	"	"	50	281		wp		12/7	"
8	P-38	P-39	WEOS C	EEOS	1543	"	"	"	57	338		wp		12/8	"
9	P-39	P-40	EEOS	WEOS	1552	"	"	"	62	400		wp		12/8	"
10	P-41	P-42	EEOS	WEOS	1607	"	"	"	62	462		wp		12/8	"
11	P-43	P-44	EEOS	WEOS	1647	"	"	"	65	490/65	DS-32	wp		12/8	"
12	P-47	P-48	EEOS	WEOS	1702	"	"	"	42	102		wp		12/8	"
13	P-47	P-49	EEOS	WEOS	1715	"	"	"	40	142		wp		12/8	"
14	P-47	P-50	EEOS	WEOS	1720	"	"	"	6	148		wp		12/8	"
15	P-44	P-51	NEOS	SEOS	1722	"	"	"	22	170		RTH		12/8	"
16	P-45	P-51	NEOS	SEOS	1726	"	"	"	22	192		"		12/8	"
17	P-46	P-51	NEOS	SEOS	1730	"	"	"	22	214		"		12/8	"
18	P-47	P-51	NEOS	SEOS	1735	"	"	"	22	236		"		12/8	"
19	P-50	P-51	NEOS	SEOS	1739	"	"	"	22	258		"		12/8	"
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 2185

DESTRUCTIVE LENGTH CARRY - OVER: 258

ATLANTIC COAS[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-8-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 169

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-54	P-53	WEOS	EEOS	922	SP	6.0	960	407	480/96	DS-35	wp		12/8	RTH
2	P-55	P-56	WEOS	EEOS	928	"	"	"	406	480/22	DS-38	wp		12/8	"
3	P-57	P-58	WEOS	EEOS	1043	"	"	"	407	429		wp		12/8	"
4	P-1	P-52	WEOS	EEOS	1250	"	"	"	22	451		wp		12/8	"
5	P-2	P-52	WEOS	EEOS	1253	"	"	"	22	473		wp		12/8	"
6	P-3	P-52	WEOS	EEOS	1255	"	"	"	22	480/15	DS-41	wp		12/8	"
7	P-4	P-52	WEOS	EEOS	1256	"	"	"	22	37		wp		12/8	"
8	P-5	P-52	WEOS	EEOS	1257	"	"	"	22	59		wp		12/8	"
9	P-6	P-52	WEOS	EEOS	1258	"	"	"	22	81		wp		12/8	"
10	P-7	P-52	WEOS	EEOS	1303	"	"	"	22	103		wp		12/8	"
11	P-8	P-52	WEOS	EEOS	1306	"	"	"	22	125		wp		12/8	"
12	P-9	P-52	WEOS	EEOS	1307	"	"	"	22	147		wp		12/8	"
13	P-10	P-52	WEOS	EEOS	1308	"	"	"	22	169		wp		12/8	"
14	P-11	P-52	WEOS	EEOS	1317	"	"	"	22	191		wp		12/8	"
15	P-12	P-52	WEOS	EEOS	1321	"	"	"	22	213		wp		12/8	"
16	P-13	P-52	WEOS	EEOS	1324	"	"	"	22	235		wp		12/8	"
17	P-14	P-52	WEOS	EEOS	1328	"	"	"	22	257		wp		12/8	"
18	P-15	P-52	WEOS	EEOS	1332	"	"	"	22	279		wp		12/8	"
19	P-16	P-52	WEOS	EEOS	1336	"	"	"	22	301		wp		12/8	"
20	P-17	P-52	WEOS	EEOS	1339	"	"	"	22	323		wp		12/8	"
21	P-18	P-52	WEOS	EEOS	1343	"	"	"	22	345		wp		12/8	"
22	P-62	P-63	WEOS	EEOS	1410	"	"	"	364	480/229	DS-43	wp		12/8	"

DAILY TOTAL FOR WELDED SEAM: 1480

DESTRUCTIVE LENGTH CARRY - OVER: 229

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-8-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 229

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	P-65	P-66	WEDS	EEDS	1527	SP	6.0	860	294	490/43	DS-45	RTH		12/9	RTH
2	P-20	P-61	WEDS	EEDS	1636	"	"	"	22	65		"		12/9	"
3	P-21	P-61	WEDS	EEDS	1639	"	"	"	22	87		"		12/9	"
4	P-22	P-61	WEDS	EEDS	1643	"	"	"	22	109		"		12/9	"
5	P-23	P-61	WEDS	EEDS	1646	"	"	"	22	131		"		12/9	"
6	P-24	P-61	WEDS	EEDS	1650	"	"	"	22	153		"		12/9	"
7	P-25	P-61	WEDS	EEDS	1654	"	"	"	22	175		"		12/9	"
8	P-26	P-61	WEDS	EEDS	1658	"	"	"	22	197		"		12/9	"
9	P-27	P-61	WEDS	EEDS	1702	"	"	"	22	219		"		12/9	"
10	P-28	P-61	WEDS	EEDS	1705	"	"	"	22	241		"		12/9	"
11	P-29	P-61	WEDS	EEDS	1708	"	"	"	22	263		"		12/9	"
12	P-30	P-61	WEDS	EEDS	1712	"	"	"	22	285		"		12/9	"
13	P-31	P-61	WEDS	EEDS	1716	"	"	"	22	307		"		12/9	"
14	P-32	P-61	WEDS	EEDS	1720	"	"	"	22	329		"		12/9	"
15	P-33	P-61	WEDS	EEDS	1724	"	"	"	22	351		"		12/9	"
16	P-34	P-61	WEDS	EEDS	1728	"	"	"	22	373		"		12/9	"
17	P-51	P-61	WEDS	EEDS	1732	"	"	"	13	386		"		12/9	"
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 637

DESTRUCTIVE LENGTH CARRY - OVER: 386

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-8-10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1220

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 243

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-54	P-55	WEOS	EEOS	850	VP	5.0	860	408	480/171	DS-37	wp		12/8	RTH
2	P-58	P-59	WEOS	EEOS	1050	"	"	"	406	480/97	DS-40	wp		12/8	"
3	P-63	P-64	WEOS	EEOS	1411	"	"	"	355	452		wp		12/9	"
4	P-66	P-67	WEOS	EEOS	1524	"	"	"	287	480/259	DS-46	wp		12/9	"
5	P-77	P-78	EEOS	WEOS	1646	"	"	"	99	347		wp		12/9	"
6	P-78	P-79	EEOS	WEOS	1650	"	"	"	84	436		wp		12/9	"
7	P-79	P-80	WEOS	EEOS		"	"	"	66	480/22	DS-48	wp		12/9	"
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1699

DESTRUCTIVE LENGTH CARRY - OVER: 22

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-8-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 0721

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 180

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-53	P-54	WEOS	EEOS	827	MK	6.0	860	408	480/108	DS-36	wp		12/8	RTH
2	P-56	P-57	WEOS	EEOS	925	"	"	"	407	480/35	DS-39	wp		12/8	"
3	P-59	P-60	WEOS	EEOS	1055	"	"	"	408	441		wp		12/8	"
4	P-61	P-62	WEOS	EEOS	1400	"	"	"	373	480/334	DS-42	wp		12/8	"
5	P-64	P-65	WEOS	EEOS	1445	"	"	"	343	480/197	DS-44	wp		12/9	"
6	P-50	P-68	EEOS	WEOS	1546	"	"	"	78	275		wp		12/9	"
7	P-68	P-69	EEOS	WEOS	1555	"	"	"	70	345		wp		12/9	"
8	P-69	P-70	EEOS	WEOS	1606	"	"	"	60	405		wp		12/9	"
9	P-70	P-71	EEOS	WEOS	1616	"	"	"	50	455		wp		12/9	"
10	P-71	P-72	EEOS	WEOS	1626	"	"	"	50	480/25	DS-47	wp		12/9	"
11	P-72	P-73	EEOS	WEOS	1636	"	"	"	50	75		wp		12/9	"
12	P-73	P-74	EEOS	WEOS	1646	"	"	"	50	125		wp		12/9	"
13	P-74	P-75	EEOS	WEOS	1656	"	"	"	50	175		wp		12/9	"
14	P-75	P-76	EEOS	WEOS	1706	"	"	"	50	225		wp		12/9	"
15	P-76	P-77	EEOS	WEOS	1716	"	"	"	50	275		wp		12/9	"
16	P-80	P-81	WEOS	EEOS	1720	"	"	"	54	329		wp		12/9	"
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 2549

DESTRUCTIVE LENGTH CARRY - OVER: 329

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-9-10

FUSION SEAM:

EXTRUSION SEAM: ✓

MACHINE NUMBER: 5382

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 68

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-34	TI	3C	3V	1651	BS			10	78		MP		12/13	RTH
2	P-51	TI	3V	3W/EOS	1700	"			22	86/108		MP		12/13	"
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 32

DESTRUCTIVE LENGTH CARRY - OVER: 108

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-9-10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 0721

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 329

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-67	P-82	WEOS	EEOS	934	MK	6.0	960	129	458		WP		12/9	RTH
2	P-67	P-83	WEOS	EEOS	934	"	"	"	163	480/141	DS-49	WP		12/9	"
3	P-68	P-51	NEOS	SEOS	930	"	"	"	22	163		WP	S/T	12/9	"
4	P-51	P-69	NEOS	SEOS	939	"	"	"	22	185		WP	"	12/9	"
5	P-51	P-70	NEOS	SEOS	945	"	"	"	22	207		WP	"	12/9	"
6	P-51	P-71	NEOS	SEOS	950	"	"	"	16	223		WP	"	12/9	"
7	P-65	P-76	SEOS	NEOS	1008	"	4	"	17	240		WP	FT	12/9	"
8	P-64	P-76	SEOS	NEOS	1010	"	"	"	5	245		WP	"	CAPED	N/A
9	P-64	P-75	SEOS	NEOS	1011	"	"	"	22	250/17	DS-51	WP	"	12/9	"
10	P-63	P-74	SEOS	NEOS	1016	"	"	"	22	39		WP		12/9	"
11	P-62	P-73	SEOS	NEOS	1019	"	"	"	22	61		WP		12/9	"
12	P-61	P-72	SEOS	NEOS	1022	"	"	"	17	78		WP		12/9	"
13	P-61	P-71	SEOS	NEOS	1025	"	"	"	5	83		WP		12/9	"
14	P-65	P-77	NEOS	SEOS	1032	"	"	"	34	117		WP		12/9	"
15	P-66	P-78	NEOS	SEOS	1045	"	"	"	22	139		WP		12/9	"
16	P-67	P-79	NEOS	SEOS	1050	"	"	"	24	163		WP		12/9	"
17	P-80	P-83	NEOS	SEOS	1058	"	"	"	22	185		WP		12/9	"
18	P-84	P-85	NEOS	SEOS	1107	"	"	"	22	207		WP		12/9	"
19	P-80	P-85	NEOS	SEOS	1111	"	"	"	16	223		WP		12/9	"
20	P-81	P-85	NEOS	SEOS	1115	"	"	"	17	240		WP		12/9	"
21	P-62	P-72	SEOS	NEOS	1020	"	"	"	5	245		WP		12/9	"
22															

DAILY TOTAL FOR WELDED SEAM: 641

DESTRUCTIVE LENGTH CARRY - OVER: 245

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-9-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 386

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-82	P-83	NEOS	SEOS	824	S.P	4.0	960	22	408		WP		12/9	RTH
2	P-82	P-84	WEOS	EEOS	908	"	6.0	"	124	480/57	DS-50	WP		12/9	"
3	P-83	P-84	WEOS	EEOS	925	"	"	"	146	203		WP		12/9	"
4	P-52	P-61	NEOS	SEOS	1039	"	"	"	22	225		WP		12/9	"
5	P-53	P-62	NEOS	SEOS	1042	"	"	"	22	247		WP		12/9	"
6	P-54	P-63	NEOS	SEOS	1046	"	"	"	22	264		WP		12/9	"
7	P-55	P-64	NEOS	SEOS	1050	"	"	"	22	291		WP		12/9	"
8	P-56	P-65	NEOS	SEOS	1054	"	"	"	22	313		WP		12/9	"
9	P-57	P-66	NEOS	SEOS	1058	"	"	"	22	335		WP		12/9	"
10	P-58	P-67	NEOS	SEOS	1101	"	"	"	22	357		WP		12/9	"
11	P-59	P-82	NEOS	SEOS	1110	"	"	"	22	379		WP		12/9	"
12	P-60	P-84	NEOS	SEOS	1114	"	"	"	22	401		WP		12/9	"
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 495

DESTRUCTIVE LENGTH CARRY - OVER: 401

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/10/10

FUSION SEAM:

EXTRUSION SEAM: ✓

REVIEWED BY:

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 446

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-87	TI	WEDS	EEDS	1422	BS	N/A	550/550	22	468		RTH		12/13	RTH
2	P-86	TI	WEDS	EEDS	1443	"	"	"	22	480/16	DX-6	"	10-474	12/13	RTH
3	P-1	TI	WEDS	EEDS	1505	"	"	"	22	46		"	10-24	12/13	RTH
4	P-91	TI	WEDS	EEDS	1545	"	"	"	22	76		"	10-54	12/13	RTH
5	P-90	TI	WEDS	EEDS	1600	"	"	"	22	104		"	10-82	12/13	RTH
6	P-89	TI	WEDS	EEDS	1608	"	"	"	22	134		"	10-112	12/13	RTH
7	P-88	TI	WEDS	EEDS	1620	"	"	"	22	162		"	10-140	12/13	RTH
8	P-113	TI	WEDS	EEDS	1700	"	"	"	100	262		"		12/13	RTH
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 254

DESTRUCTIVE LENGTH CARRY - OVER: TOTAL 626' 262

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/10/10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

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	P-1	P-86	SEOS	NEOS	1223	SP	6.0	860	406	480/327	DS-52	wp		12/10	RTH
2	P-89	P-90	SEOS	NEOS	1327	"	"	"	406	480/253	DS-55	wp		12/10	RTH
3	P-96	P-97	EEOS	WEOS	1426	"	"	"	169	422		wp		12/10	"
4	P-103	P-107	NEOS	SEOS	1457	"	"	"	22	444		wp		12/10	"
5	P-102	P-107	EEOS	WEOS	1505	"	"	"	34	478		wp		12/10	"
6	P-102	P-103	EEOS	WEOS	1509	"	"	"	104	490/92	DS-60	wp		12/10	"
7	P-104	P-105	EEOS	WEOS	1537	"	"	"	149	211		wp		12/10	RTH
8	P-91	P-114	SEOS	NEOS	1615	"	"	"	344	480/75	DS-64	wp		12-11	TH
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1604

DESTRUCTIVE LENGTH CARRY - OVER: 75

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/10/10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 0721

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 245

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-86	P-87	SEOS	NEOS	1230	MK	60	960	406	480/171	DS-53	wp		12/10	RTH
2	P-90	P-91	SEOS	NEOS	1335	"	"	"	408	480/99	DS-56	wp		12/10	"
3	P-97	P-99	EEOS	WEOS	1432	"	"	"	161	260		wp		12/10	"
4	P-100	P-101	EEOS	WEOS	1500	"	"	"	155	415		wp		12/10	"
5	P-106	P-108	EEOS	WEOS	1537	"	"	"	103	480/30	DS-61	wp		12/10	"
6	P-110	P-111	EEOS	WEOS	1607	"	"	"	37	75		wp		12/10	"
7	P-111	P-112	EEOS	WEOS	1608	"	"	"	42	117		wp		12/10	"
8	P-110	P-112	EEOS	WEOS	1613	"	"	"	43	160		wp		12/10	"
9	P-112	P-115	EEOS	WEOS	1642	"	"	"	11	171		wp		12-11	"
10	P-114	P-115	EEOS	WEOS	1647	"	"	"	14	182		wp		12-11	"
11	P-111	P-115	SEOS	NEOS	1651	"	"	"	15	197		wp		12-11	"
12	P-91	P-115	SEOS	NEOS	1654	"	"	"	22	219		wp		12-11	"
13	P-91	P-112	SEOS	NEOS	1657	"	"	"	22	241		wp		12-11	"
14	P-91	P-113	SEOS	NEOS	1702	"	"	"	22	263		wp		12-11	"
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1458

DESTRUCTIVE LENGTH CARRY - OVER: 263

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/10/10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1220

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 22

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-88	P-89	SEOS	NEOS	1250	VP	6.0	860	406	428		WP		12/10	RTH
2	P-92	P-93	EEOS	WEOS	1346	"	"	"	203	480/151	DS-58	WP		12/10	"
3	P-93	P-98	SEOS	NEOS	1415	"	"	"	22	173		WP		12/10	"
4	P-92	P-98	EEOS	WEOS	1423	"	"	"	30	203		WP		12/10	"
5	P-94	P-98	EEOS	WEOS	1428	"	"	"	25	229		WP		12/10	"
6	P-93	P-94	EEOS	WEOS	1435	"	"	"	178	406		WP		12/10	"
7	P-94	P-100	EEOS	WEOS	1501	"	"	"	161	480/87		WP		12/10	"
8	P-104	P-107	EEOS	WEOS	1527	"	"	"	26	113		WP		12/10	"
9	P-103	P-104	EEOS	WEOS	1530	"	"	"	104	717		WP		12/10	"
10	P-105	P-109	EEOS	WEOS	1548	"	"	"	94	311		WP		12/10	"
11	P-94	P-114	SEOS	NEOS	1610	"	"	"	5	316		WP	Capped	—	—
12	P-95	P-114	SEOS	NEOS	1626	"	"	"	22	339		WP		12-11	"
13	P-96	P-114	SEOS	NEOS	1630	"	"	"	22	360		WP		12-11	"
14	P-97	P-114	SEOS	NEOS	1634	"	"	"	22	382		WP		12-11	"
15	P-99	P-114	SEOS	NEOS	1639	"	"	"	22	404		WP		12-10	"
16	P-100	P-114	SEOS	NEOS	1644	"	"	"	22	426		WP		12-11	"
17	P-101	P-114	SEOS	NEOS	1649	"	"	"	22	448		WP		12-11	"
18	P-102	P-114	SEOS	NEOS	1654	"	"	"	22	470		WP		12-11	"
19	P-107	P-114	SEOS	NEOS	1689	"	"	"	22	480/12	DS-63	WP		12-11	"
20	P-104	P-114	SEOS	NEOS	1702	"	"	"	22	34		WP		12-11	"
21	P-105	P-114	SEOS	NEOS	1703	"	"	"	22	56		WP		12-11	"
22	P-106	P-114	SEOS	NEOS	1706	"	"	"	22	78				12-11	"

DAILY TOTAL FOR WELDED SEAM: 1496

DESTRUCTIVE LENGTH CARRY - OVER: TOTAL 1562 | 78 | 144'

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/10/10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1220

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 78

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	P-108	P-114	SEOS	NEOS	1709	VP	6.0	860	22	100		WP		12-11	TH
2	P-109	P-114	SEOS	NEOS	1712	"	"	"	22	122		WP		12-11	TH
3	P-110	P-114	SEOS	NEOS	1716	"	"	"	22	144		WP		12-11	TH
4															
5															
6															
7															
8															
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19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 66

DESTRUCTIVE LENGTH CARRY - OVER: TOTAL 562 | 144

ATLANTIC CO[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-10-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1218

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 258

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-87	P-88	SEOS	NEOS	1250	BV	6.0	860	406	480/104	DS54	wp		12/10	RTH
2	P-94	P-95	EEOS	WEOS	1345	"	"	"	186	370		wp		12/10	RTH
3	P-95	P-96	EEOS	WEOS	1410	"	"	"	178	480/68	DS-57	wp		12/10	"
4	P-101	P-102	EEOS	WEOS	1457	"	"	"	146	214		wp		12/10	"
5	P-105	P-106	EEOS	WEOS	1526	"	"	"	114	328		wp		12/10	"
6	P-109	P-110	EEOS	WEOS	1547	"	"	"	88	416		wp		12/10	"
7	P-112	P-113	EEOS	WEOS	1601	"	"	"	100	480/36	DS-62	wp		12/10	"
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1218

DESTRUCTIVE LENGTH CARRY - OVER: 36

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 21

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-11-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY: [illegible]

MACHINE NUMBER: 721

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 263

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-118	P-119	SEOS	NEOS	0734	MK	4.0	740	22	285		TS		12-11	TH
2	P-117	P-119	WEOS	EEOS	0741	"	"	"	22	367		TS		12-11	TH
3	P-117	P-118	WEOS	EEOS	0754	"	"	"	90	447		TS		12-11	TH
4	P-122	P-123	WEOS	EEOS	0816	"	"	"	201	480/168	DS-66	TS		12-11	TH
5	P-126	P-127	EEOS	WEOS	0852	"	"	"	198	366		TS		12-11	TH
6	P-132	P-133	WEOS	EEOS	0941	"	"	"	91	457		TS		12-11	TH
7	P-134	P-135	WEOS	EEOS	1016	"	"	"	135	480/102	DS-90	TS		12-11	TH
8	P-138	P-139	EEOS	WEOS	1054	"	"	"	172	374		TS		12-11	TH
9	P-144	P-145	EEOS	WEOS	1141	"	"	"	92	366/0	DS-78	TS		12-11	TH
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1063

DESTRUCTIVE LENGTH CARRY - OVER: Ø

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-11-10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1220

REVIEWED BY:

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 144'

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-116	P-117	WEOS	EEOS	0727	VP	6.0	960	161	305		TS		12-11	TH
2	P-120	P-121	WEOS	EEOS	0753	"	"	"	201	480/26	DS-65	TS		12-11	TH
3	P-123	P-124	WEOS	EEOS	0826	"	"	"	200	226		TS		12-11	TH
4	P-129	P-130	WEOS	EEOS	0910	"	"	"	49	275		TS		12-11	TH
5	P-130	P-131	WEOS	EEOS	0920	"	"	"	62	337		TS		12-11	TH
6	P-131	P-132	WEOS	EEOS	0935	"	"	"	73	410		TS		12-11	TH
7	P-133	P-134	WEOS	EEOS	0952	"	"	"	108	460/38	DS-68	TS		12-11	TH
8	P-136	P-137	WEOS	SEOS	1009	"	"	"	22	60		TS		12-11	TH
9	P-135	P-137	EEOS	WEOS	1030	"	"	"	15	75		TS		12-11	TH
10	P-135	P-136	EEOS	WEOS	1032	"	"	"	132	207		TS		12-11	TH
11	P-139	P-140	EEOS	WEOS	1106	"	"	"	190	397/0	DS-77	TS		12-11	TH
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1213

DESTRUCTIVE LENGTH CARRY - OVER: Ø

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-11-16

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1218

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 36'

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-114	P-116	WEOS	EEOS	0740	BV	3.0	360	22	58		TS		12-11	TH
2	P-91	P-116	WEOS	EEOS	0744	BV	"	"	22	80		TS		12-11	TH
3	P-90	P-116	WEOS	EEOS	0748	"	"	"	22	102		TS		12-11	TH
4	P-89	P-116	WEOS	EEOS	0752	"	"	"	22	124		TS		12-11	TH
5	P-88	P-116	WEOS	EEOS	0756	"	"	"	22	146		TS		12-11	TH
6	P-87	P-116	WEOS	EEOS	0800	"	"	"	22	168		TS		12-11	TH
7	P-86	P-116	WEOS	EEOS	0804	"	"	"	22	190		TS		12-11	TH
8	P-125	P-126	EEOS	WEOS	0845	"	"	"	188	378		TS		12-11	TH
9	P-92	P-125	EEOS	WEOS	1000	"	"	"	205	460/103	DS-69	TS		12-11	TH
10	P-140	P-141	EEOS	WEOS	1040	"	"	"	161	264		TS		12-11	TH
11	P-143	P-144	EEOS	WEOS	1115	"	"	"	104	368		TS		12-11	TH
12	P-142	P-144	EEOS	WEOS	1130	"	"	"	11	379		TS		12-11	TH
13	P-146	P-147	SEOS	NEOS	1140	"	"	"	22	401		TS		12-11	TH
14	P-124	P-146	WEOS	EEOS	1158	"	"	"	96	460/17	DS-92	TS		12-11	TH
15	P-124	P-147	WEOS	EEOS	1215	"	"	"	88	105		TS		12-11	TH
16	P-52	P-116	NEOS	SEOS	1243	"	"	"	22	127		TS		12-11	TH
17	P-53	P-117	NEOS	SEOS	1247	"	"	"	22	149		TS		12-11	TH
18	P-54	P-118	NEOS	SEOS	1251	"	"	"	22	171		TS		12-11	TH
19	P-55	P-120	NEOS	SEOS	1255	"	"	"	22	193		TS		12-11	TH
20	P-56	P-121	NEOS	SEOS	1259	"	"	"	22	215		TS		12-11	TH
21	P-57	P-122	NEOS	SEOS	1303	"	"	"	22	237		TS		12-11	TH
22	P-58	P-123	NEOS	SEOS	1306	"	"	"	22	259		TS		12-11	TH
								DAILY TOTAL FOR WELDED SEAM:	1193						
								DESTRUCTIVE LENGTH CARRY - OVER:		259					

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-11-10

FUSION SEAM: ✓

EXTRUSION SEAM:

MACHINE NUMBER: 1218

REVIEWED BY: [illegible]

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 259

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	P-59	P-124	NEOS	SEOS	1311	BV	3.0	860	22	281		TS		12-11	TH
2	P-60	P-147	NEOS	SEOS	1314	"	"	"	22	3030	DS-76	TS		12-11	TH
3															
4															
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21															
22															

DAILY TOTAL FOR WELDED SEAM: 44

DESTRUCTIVE LENGTH CARRY - OVER: Ø

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-11-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY:

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 75

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-119	P-120	WEOS	EEOS	0744	SP	6.0	860	80	155		TS		12/13	TH
2	P-118	P-120	WEOS	EEOS	0755	"	"	"	71	236		TS		12-11	TH
3	P-121	P-122	WEOS	EEOS	0818	"	"	"	200	436		TS		12-11	TH
4	P-127	P-128	EEOS	WEOS	0902	"	"	"	205	480/161	DS-67	TS		12-11	TH
5	P-137	P-138	EEOS	WEOS	1035	"	"	"	25	186		TS		12-11	TH
6	P-136	P-138	EEOS	WEOS	1038	"	"	"	131	317		TS		12-11	TH
7	P-142	P-143	NEOS	SEOS	1109	"	"	"	22	339		TS		12-11	TH
8	P-141	P-143	EEOS	WEOS	1120	"	"	"	89	428		TS		12-11	TH
9	P-141	P-142	EEOS	WEOS	1240	"	"	"	52	480/0	DS-71	TS		12-11	TH
10	P-128	P-145	EEOS	WEOS	1200	"	"	"	41	41		TS		12-11	TH
11	P-128	P-144	EEOS	WEOS	1205	"	"	"	43	84		TS		12-11	TH
12	P-128	P-142	EEOS	WEOS	1210	"	"	"	44	128		TS		12-11	TH
13	P-128	P-141	EEOS	WEOS	1215	"	"	"	44	172		TS		12-11	TH
14	P-128	P-140	EEOS	WEOS	1220	"	"	"	46	213		TS		12-11	TH
15	P-145	P-146	SEOS	NEOS	1239	"	"	"	22	240		TS		12-11	TH
16	P-124	P-145	SEOS	NEOS	1245	"	"	"	28	268		TS		12-11	TH
17	P-123	P-145	SEOS	NEOS	1300	"	"	"	2	270		TS	Capped 16F	—	—
18	P-123	P-128	SEOS	NEOS	1301	"	"	"	20	290		TS		12-11	TH
19	P-122	P-127	SEOS	NEOS	1312	"	"	"	15	305		TS		12-11	TH
20	P-121	P-127	SEOS	NEOS	1315	"	"	"	6	311		TS		12-11	TH
21	P-121	P-126	SEOS	NEOS	1320	"	"	"	15	326		TS		12-11	TH
22	P-120	P-126	SEOS	NEOS	1322	"	"	"	8	334		TS		12-11	TH

DAILY TOTAL FOR WELDED SEAM: 1219

DESTRUCTIVE LENGTH CARRY - OVER: 334

ATLANTIC COA[illegible] CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12-11-10

FUSION SEAM: ✓

EXTRUSION SEAM:

REVIEWED BY: [illegible]

MACHINE NUMBER: 1219

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 334

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	P-120	P-125	SEOS	NEOS	1324	SP	6.0	860	29	363		TS		12-11	TH
2	P-92	P-119	SEOS	NEOS	1330	"	"	"	20	383		TS		12-11	TH
3	P-98	P-117	SEOS	NEOS	1335	"	"	"	20	403		TS		12-11	TH
4	P-94	P-116	SEOS	NEOS	1340	"	"	"	21	424		TS		12-11	TH
5	P-60	P-148	WEOS	EEOS	1350	"	"	"	305	480/249	DS-73	TS		12/13	TH
6	P-148	P-149	NEOS	SEOS	1448	"	"	"	10	259		TS		12/13	TH
7	P-60	P-149	WEOS	EEOS	1451	"	"	"	22	281		TS		12/13	TH
8	P-84	P-149	WEOS	EEOS	1455	"	"	"	272	480/73	DS-74	TS		12/13	TH
9	P-85	P-149	WEOS	WEOS	1550	"	"	"	5	78		TS		12/13	TH
10	P-81	P-149	NEOS	SEOS	1551	"	"	"	10	88		TS		12/13	TH
11	P-150	P-151	SEOS	NEOS	1600	"	"	"	12	100		TS		12-11	TH
12	P-145	P-151	SEOS	NEOS	1608	"	"	"	12	112		TS		12-11	TH
13	P-146	P-151	WEOS	EEOS	1610	"	"	"	94	206		TS		12-11	TH
14	P-147	P-151	WEOS	EEOS	1626	"	"	"	34	240		TS		12-11	TH
15	P-147	P-150	WEOS	EEOS	1633	"	"	"	51	291		TS		12-11	TH
16	P-60	P-150	WEOS	EEOS	1640	"	"	"	75	366		TS		12-11	TH
17	P-148	P-150	WEOS	SEOS	1654	"	"	"	12	378/Ø	DS-75	TS		12-11	TH
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 1004

DESTRUCTIVE LENGTH CARRY - OVER: Ø

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF SEAMING: 12/13/2010

FUSION SEAM:

EXTRUSION SEAM: ✓

REVIEWED BY:

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 196

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	F-35	TI	EEDS	EEDS	1200	IS	N/A	550/550	25	221		RTH		12/13	RTH
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															

DAILY TOTAL FOR WELDED SEAM: 25

DESTRUCTIVE LENGTH CARRY - OVER: 221

ATLANTIC COA[illegible] CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX N

Defect Logs

GEOMEMBRANE DEFECT LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

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	P-1/2	100' S of NEOS	DS-1	12/6	RTH		12/7	12/13
B	P-2/3	100' S of NEOS	DS-2	"	"		12/7	12/13
C	P-3/4	100' S of NEOS	DS-3	"	"		12/7	12/13
D	P-3/4	90' S of NEOS	BO	"	"	CAPED	N/A	N/A
E	P-6/7	170' S of NEOS	DS-5	"	"		12/7	12/13
F	P-7/8	100' S of NEOS	DS-7	"	"		12/7	12/13
G	P-10/11	168' S of NEOS	DS-10	"	"		12/7	12/13
H	P-9	3' S of NEOS	D	"	"		12/9	12/10
I	P-11/12	172' S of NEOS	DS-11	"	"		12/7	12/13
J	P-12/13	96' N of SEOS	DS-12	"	"		12/7	12/13
K	P-14/15	161' N of SEOS	DS-14	"	"		12/7	12/13
M	P-10/TI	7' E of WEOS	D	"	"		12/9	12/10
N	P-7/TI	8' E of WEOS	D	"	"		12/9	12/10
P	P-16/17	24' N of SEOS	DS-18	"	"		12/7	12/13
Q	P-17/18	85' N of SEOS	DS-19	"	"		12/7	12/13
R	P-18/19/TI	@ Int	T	"	"		12/9	12/10
S	P-17/18/TI	@ Int	T	"	"		12/9	12/10
T	P-16/17/TI	@ Int	T	"	"		12/9	12/10
V	P-15/16/TI	@ Int	T	"	"		12/9	12/10
W	P-14/15/TI	@ Int	T	"	"		12/9	12/10
X	P-13/14/TI	@ Int	T	"	"		12/9	12/10

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: I001.154

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

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	P4/P-5	172' S of NEOS	DS-4	12/6	wp		12/7	12/13
B	P-5/P-6	172' S of NEOS	DS-6	12/6	wp		12/7	12/13
C	P-8/P9	246's of NEOS	DS-8	12/6	wp		12/7	12/14
D	P-9/P10	244' S of NEOS	DS-9	12/6	wp		12/7	12/13
E	P9/P10	185' S of NEOS	BO	12/6	wp		12/7	12/13
F	P9/P10	200' S of NEOS	BO	12/6	wp		12/7	12/13
G	P-13	3' S of NEOS	D	12/6	wp		12/9	12/10
H	P-13/P14	92' S of NEOS	DS-13	12/6	wp		12/7	12/13
I	P-15/P16	322' S of NEOS	DS-15	12/6	wp		12/7	12/13
J	P-15	15' S of NEOS	D	12/6	wp		12/9	12/14
K	P18/P19	81' N of SEOS	DS-16	12/6	wp		12/7	12/13
M	P-22/P-23	50' S of NEOS	DS-17	12-7	wp		12/7	12/[illegible]
N	P-11/12/TI	@ Int	T	"	RTH		12/9	12/[illegible]
P	P-10/11/TI	@ Int	T	"	"		12/9	12/10
Q	P-9/10/TI	@ Int	T	"	"		12/9	12/10
R	P-8/9/TI	@ Int	T	"	"		12/9	12/10
S	P-7/8/TI	@ Int	T	"	"		12/9	12/10
T	P-6/7/TI	@ Int	T	"	"		12/9	12/10
V	P-5/6/TI	@ Int	T	"	"		12/9	12/10
W	P-4/5/TI	@ Int	T	"	"		12/9	12/10
X	P-3/4/TI	@ Int	T	"	"		12/9	12/10

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

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	CQA MONITOR INITIALS	REMARKS	REPAIR DATE	TEST DATE
A	P-2/3/TI	@ Int	T	12/7	RTH		12/9	12/10
B	P-4/1C	100' S of NEOP/P3/4	DX-1	"	"	Taken from 1C	12/7	12/13
C	P-34/TI	10' E of WEOS	T	"	"		12/9	12/10
D	P-34/51	169' N of SEOS	DS-34	"	"		12/8	12/14
E	P-27	1' S of NEOS	D	12/8	"		12/9	12/10
F	P/27/28/TI	@ Int	T	"	"		12/9	12/10
G	P 28/TI	@ Int 10' E of WEOS	T	"	"		12/9	12/10
H	P-28/29/TI	@ Int	T	"	"		12/9	12/10
I	P 29/TI	@ Int 8' E of WEOS	T	"	"		12/9	12/10
J	P-29/30/TI	@ Int	T	"	"		12/9	12/10
K	P 30/TI	@ Int 8' E of WEOS	T	"	"		12/9	12/10
M	P-30/31/TI	@ Int	T	"	"		12/9	12/10
N	P-31/TI	@ Int 9' E of WEOS	T	"	"		12/9	12/10
P	P-31/32/TI	@ Int	T	"	"		12/9	12/10
Q	P-32/TI	@ Int 9' E of WEOS	T	"	"		12/9	12/10
R	P-32/33/TI	@ Int	T	"	"		12/9	12/10
S	P-33/TI	@ Int 9' E of WEOS	T	"	"		12/9	12/10
T	P 33/34/TI	@ Int	T	"	"		12/9	12/10
V	P-34/51/TI	@ Int	T	"	"		12/9	12/10
W	P-35/51/TI	@ Int	T	"	"	NO PATCH (3W got a T it was seamed)		
X	P-35/51	10' N of SEOS	BO	"	"		12/8	12/10

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: I001.154

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2I

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-20/P-21	9' N of SFOS	DS-20	12-7	wp		12/7	12/14
B	P-24/P25	79' S of NFOS	DS-21	12-7	wp		12/7	12/13
C	P-25/P-26	126' S of NFOS	DS-22	12-7	wp		12/7	12/13
D	P-26/P-27	65' S of NFOS	DS-23	12-7	wp		12/7	12/14
E	P-27/P28	156' S of NFOS	DS-24	12-7	wp		12/7	12/13
F	P-19/P-20/21	@ INT	T	12-7	wp		12/9	12/10
G	P-20/TI	@ INT	T	12-7	wp	CAPED	N/A	N/A
H	P-20/21/TI	@ INT	T	12-7	wp		12/9	12/10
I	P-21/TI	6' E of NFOS	T	12-7	wp		12/9	12/10
J	P-21/22/TI	@ INT	T	12-7	wp		12/9	12/10
K	P-22/TI	6' E of NFOS	T	12-7	wp		12/9	12/10
M	P-22/23/TI	@ INT	T	12-7	wp		12/9	12/10
N	P-23/TI	6' E of NFOS	T	12-7	wp		12/9	12
P	P-23/24/TI	@ INT	T	12-7	wp		12/9	12/10
Q	P-24/TI	6' E of NFOS	T	12-7	wp		12/9	12/10
R	P-24/25/TI	@ INT	T	12-7	wp		12/9	12/10
S	P-25/TI	6' E of NFOS	T	12-7	wp		12/9	12/10
T	P-25/26/TI	@ INT	T	12-7	wp		12/9	12/10
V	P-26/TI	6' E of NFOS	T	12-7	wp		12/9	12/10
W	P-26/27/TI	@ INT	T	12-7	wp		12/9	12/10
X	P-27/TI	6' E of NFOS	T	12-7	wp		12/9	12/10

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

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	P-25/71	9' W of EEOS	DS-25	12-7	wp		12/9	12/10
B	P-28/29	203 S of NEOS	DS-26	12-7	wp		12/8	12/13
C	P-29/30	142' S of NEOS	DS-27	12-7	wp		12/8	12/13
D	P-30/31	357' S of NEOS	DS-28	12-7	wp		12/8	12/14
E	P-31/32	231' S of NEOS	DS-29	12-7	wp		12/8	12/13
F	P-32/33	280' S of NEOS	DS-30	12-7	wp		12/8	12/14
G	P-33/34	220' S of NEOS	DS-31	12-7	wp		12/8	12/13
H	P-43/44	18' W of EEOS	DS-32	12-7	wp		12/8	12/10
I	P-45/46	76' W of EEOS	DS-33	12-7	wp		12/8	12/10
J	P-47/48/49	@ INT	T	12-8	wp		12/8	12/10
K	P-47/49	12' W of EEOS	BO	12-8	wp		12/8	12/10
M	P-47/49/50	@ INT	T	12-8	wp		12/8	12/10
N	P-47/50/51	@ INT	T	12-8	wp		12/8	12/10
P	P-46/47/51	@ INT	T	12-8	wp		12/8	12/10
Q	P-45/46/51	@ INT	T	12-8	wp		12/8	12/10
R	P-44/45/51	@ INT	T	12-8	wp		12/8	12/10
S	P-43/44/51	@ INT	T	12-8	wp		12/8	12/10
T	P-42/43/51	@ INT	T	12-8	wp		12/8	12/10
V	P-41/42/51	@ INT	T	12-8	wp		12/8	12/10
W	P-40/41/51	@ INT	T	12-8	wp		12/8	12/10
X	P-39/40/41	@ INT	T	12-8	wp		12/8	12/10

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

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	P-38/39/51	@ INT	T	12-8	wp		12/8	12/10
B	P-37/38/51	@ INT	T	12-8	wp		12/8	12/10
C	P-31/31/51	@ INT	T	12-8	wp		12/8	12/10
D	P-35/36/51	@ INT	T	12-8	wp		12/8	12/10
E	P-52/53	311' E of WEOS	DS-35	12-8	wp		12/10	12/13
F	P-53/54	300' E of WEOS	DS-36	12-8	wp		12/10	12/13
G	P-54/55	237' E of WEOS	DS-37	12-8	wp		12/10	12/13
H	P-55/56	384' E of WEOS	DS-38	12-8	wp		12/10	12/13
I	P-56/57	372' E of WEOS	DS-39	12-8	wp		12/9	12/13
J	P-58/59	309' E of WEOS	DS-40	12-8	wp		12/13	12/13
K	P-1/2/52	@ INT	T	12-8	wp		12/10	12/13
M	P-2/3/52	@ INT	T	12-8	wp		12/10	12/[illegible]
N	P-3/4/52	@ INT	T	12-8	wp		12/10	12/[illegible]
P	P-4/5/52	@ INT	T	12-8	wp		12/10	12/13
Q	P-5/6/52	@ INT	T	12-8	wp		12/10	12/13
R	P-6/7/52	@ INT	T	12-8	wp		12/10	12/13
S	P-7/8/52	@ INT	T	12-8	wp		12/10	12/13
T	P-8/9/52	@ INT	T	12-8	wp		12/10	12/13
V	P-9/10/52	@ INT	T	12-8	wp		12/10	12/13
W	P-10/11/52	@ INT	T	12-8	wp		12/10	12/13
X	P-11/12/52	@ INT	T	12-8	wp		12/10	12/13

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2

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	P47/51	8' S of NEOS	BO	12/8	RTH		12/8	12/10
B	P-3/52	7' E of WEOS	DS-41	12-8	wp		12/10	12/13
C	P-12/13/52	@ INT	T	12-8	wp		12/10	12/13
D	P-13/14/52	@ INT	T	12-8	wp		12/10	12/13
E	P-14/15/52	@ INT	T	12-8	wp		12/10	12/13
F	P-15/16/52	@ INT	T	12-8	wp		12/10	12/13
G	P-16/17/52	@ INT	T	12-8	wp		12/10	12/13
H	P-17/18/52	@ INT	T	12-8	wp		12/10	12/13
I	P-61/62	34' E of WEOS	DS42	12-8	wp		12/9	12/14
J	P-62/63	135' E of WEOS	DS43	12-8	wp		12/10	12/13
K	P-64/65	146' E of WEOS	DS-44	12-8	wp		12/9	12/13
M	P-65/66	251' E of WEOS	DS-45	12-8	wp		12/9	12/13
N	P-66/67	28' E of WEOS	DS-46	12-8	wp		12/9	12/13
P	P-71/72	25' W of EEOS	DS47	12-8	wp		12/9	12/10
Q	P-65/66	235' E of WEOS	BO	12-8	wp		12/9	12/13
R	P-65/66	280' E of WEOS	BO	12-8	wp		12/9	12/13
S	P-71/72	40' W of EEOS	BO	12-8	wp	capped by 9J	N/A	N/A
T	P-72/73	40' W of EEOS	BO	12-8	wp		12/9	12/10
V	P-79/80	44' W of EEOS	DS-48	12-8	wp		12/9	12/10
W	P-66/67	246' E of WEOS	BO	12-8	wp		12/9	12/13
X	P-67/82/83	@ INT	T	12-9	wp		12/9	12/13

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

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	P.51/50	@ Int of P.45/46/51	DX-2	12/8	RTH		12/8	12/14
B	P.19/20/61	@ Int	T	"	"	capped by 10J	N/A	N/A
C	P.20/21/61	@ Int	T	"	"		12/10	12/10
D	P.21/22/61	@ Int	T	"	"		12/10	12/10
E	P.22/23/61	@ Int	T	"	"		12/10	12/10
F	P.23/24/61	@ Int	T	"	"		12/10	12/10
G	P.24/25/61	@ Int	T	"	"		12/10	12/10
H	P.25/26/61	@ Int	T	"	"		12/10	12/10
I	P.26/27/61	@ Int	T	"	"		12/10	12/10
J	P.27/28/61	@ Int	T	"	"		12/10	12/10
K	P.28/29/61	@ Int	T	"	"		12/10	12/10
M	P.29/30/61	@ Int	T	"	"		12/13	12/13
N	P.30/31/61	@ Int	T	"	"		12/9	12/10
P	P.31/32/61	@ Int	T	"	"		12/9	12/10
Q	P.32/33/61	@ Int	T	"	"		12/9	12/10
R	P.33/34/61	@ Int	T	"	"		12/9	12/10
S	P.34/51/61	@ Int	T	"	"		12/9	12/10
T	P.77/78	E of WEOS	FM	"	"		12/9	12/10
V	P.63/64	200' E of WEOS	BO	"	"		12/9	12/13
W	P.66/67	64' E of WEOS	BO	"	"		12/9	12/13
X	P.65/66	165' E of WEOS	BO	"	"		12/9	12/13

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: I001.164

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 9

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-62/83/84	@ INT	T	12-9	wp		12/9	12/13
B	P-67/83	22' E of WEOS	DS-49	12-9	wp		12/9	12/13
C	P-67/83	70', EOF WEOS	BO	12-9	wp		12/9	12/13
D	P-82/84	72' E of WEOS	DS-50	12-9	wp		12/9	12/13
E	P-50/51/68	@ INT	T	12-9	wp		12/9	12/10
F	P-51/68/69	@ INT	T	12-9	wp		12/9	12/10
G	P-51/69/70	@ INT	T	12-9	wp		12/9	12/10
H	P-51/70/71	@ INT	T	12-9	wp		12/9	12/10
I	P-51/61/71	@ INT	T	12-9	wp		12/9	12/10
J	P-61/71/72	@ INT	T	12-9	wp		12/9	12/10
K	P-70/83/84/85	@ INT	T	12-9	wp		12/9	12/10
M	P-61/62/72/73	@ INT	T	12-9	wp		12/9	12/10
N	P-62/63/73/74	@ INT	T	12-9	wp		12/9	12/10
P	P-63/64/74/75	@ INT	T	12-9	wp		12/9	12/10
Q	P-64/65/75/76	@ INT	T	12-9	wp	CAPED	N/A	N/A
R	P-65/76/77	@ INT	T	12-9	wp		12/9	12/10
S	P-64/75	5' N of SEOS	DS-51	12-9	wp		12/9	12/10
T	P-65/66/77/78	@ INT	T	12-9	wp		12/9	12/10
V	P-66/67/79/80	@ INT	T	12-9	wp		12/9	12/10
W	P-67/79/80/83	@ INT	T	12-9	wp		12/9	12/10
X	P-80/81/85	@ INT	T	12-9	wp		12/9	12/10

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: I001.154

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2I

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	P-65/66	70' E of WEOS	PT	12/9	RTH		12/9	12/13
B	P-65/66	120' E of WEOS	"	"	"		12/9	12/13
C	P-12/13/TI	@ Int	T	"	"		12/9	12/10
D	P-28/TI	5' W of EEOS	PT	"	"		12/9	12/10
E	P-83	60' E of WEOP	D	"	"		12/13	12/14
F	P-72	5' E of WEOP	SI	"	"		12/9	12/10
G	P-73	12' E of WEOP	"	"	"		12/9	12/10
H	P-76/95	Sample taken from 95	DX-3	"	"		12/9	12/10
I	P-66/8X	Taken from 8X	DX-5	"	"		12/13	12/14
J	P-19/61	Caps the whole seam	IO	12/10	"		12/10	12/14
K	P-1	10' N of SEOP	D	"	"		12/10	12/14
M	P-88/89	75' N of SEOS	BO	"	"		12/11	12/[illegible]
N	P-87/88	290' N of SEOS	BO	"	"		12/11	12/13
P	P-87/88	185' N of SEOS	BO	"	"		12/11	12/13
Q	P-87/88	120' N of SEOS	BO	"	"		12/11	12/13
R	P-89/90	200' N of SEOS	BO	"	"		12/11	12/13
S	P-90/91	350' N of SEOS	BO	"	"		12/11	12/13
T	P-92/93/98	@ Int	T	"	"		12/11	12/13
V	P-93/94/98	@ Int	T	"	"		12/11	12/14
W	P-1/2/TI	@ Int	T	"	"		12/10	12/13
X	P-1/86/TI	@ Int	T	"	"		12/10	12/13

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [signature]

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	P-59/60/62/64	@ INT	T	12-9	up		12/10	12/14
B	P-58/59/62/62	@ INT	T	12-9	up		12/10	12/13
C	P-57/58/66/67	@ INT	T	12-9	up		12/10	12/13
D	P-56/57/65/66	@ INT	T	12-9	up		12/10	12/13
E	P-55/56/64/65	@ INT	T	12-9	up		12/10	12/13
F	P-54/55/63/64	@ INT	T	12-9	up		12/10	12/14
G	P-53/54/62/63	@ INT	T	12-9	up		12/10	12/14
H	P-52/53/61/62	@ INT	T	12-9	up		12/10	12/14
I	P-18/19/52/61	@ INT	T	12-9	up		12/10	12/10
J	P-30/TI	PATCH 3K	DX-4	12-9	up		12/9	12/10
K	P-1/86	79' N of SEOS	DS-52	12-10	up		12/11	12/14
M	P-86/87	235' N of SEOS	DS-53	12-10	up		12/11	12/13
N	P-87/88	222' N of SEOS	DS-54	12-10	up		12/11	12/13
P	P-89/90	153' N of SEOS	DS-55	12-10	up		12/13	12/13
Q	P-90/91	309' N of SEOS	DS-56	12-10	up		12/11	12/13
R	P-95/96	110' W of EEOS	DS-57	12-10	up		12/11	12/13
S	P-92/93	52' W of EEOS	DS-58	12/10	up		12/11	12/13
T	P-99/100	741' W of EEOS	DS-59	12-10	up		12/11	12/13
V	P-100/101	12' W of EEOS	DS-60	12-10	up		12/11	12/13
W	P-106/108	65' W of EEOS	DS-61	12-10	up		12/11	12/13
X	P-99/100	123' W of EEOS	B6	12-10	up		12/11	12/13

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: I001.154

REVIEWED BY: [signature]

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

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	P-86/87/TI	@Int	T	12/10	RTH		12/10	12/13
B	P-87/88/TI	@Int	T	"	"		12/10	12/13
C	P-88/89/TI	@Int	T	"	"		12/10	12/13
D	P-89/90/TI	@Int	T	"	"		12/10	12/13
E	P-90/91/TI	@Int	T	"	"		12/10	12/13
F	P-86/TI	6' E of WEDS	DX-6	"	"		12/11	12/12
G	P-112/113	50' W of EFDS	BO	"	"		12/11	12/13
H	P-110/111/112	@Int	T	"	"		12/11	12/13
I	P-111/112/115	@Int	T	"	"		12/11	12/13
J	P-110/111/114/115	@Int	T	"	"		12/11	12/13
K	P-110/112/113	@Int	T	"	"		12/11	12/13
M	P-91/114/115	@Int	T	"	"		12/11	12/[illegible]
N	P-91/112/115	@Int	T	"	"		12/11	12/[illegible]
P	P-91/112/113	@Int	T	"	"		12/11	12/13
Q	P-91/113/TI	@Int	T	"	"		12/11	12/13
R	P-109/110/114	@Int	T	"	"		12/11	12/13
S	P-108/109/114	@Int	T	"	"		12/11	12/13
T	P-106/108/114	@Int	T	"	"		12/11	12/13
V	P-105/106/114	@Int	T	"	"		12/11	12/13
W	P-104/105/114	@Int	T	"	"		12/11	12/13
X	P-104/107/114	@Int	T	"	"		12/11	12/13

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [signature]

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	P112/113	64' W of EEOS	DS-62	12/10	ivp		12/11	12/13
B	P107/114	10' N of SEOS	DS-63	12/10	ivp		12/11	12/14
C	P-91/114	269' N of SEOS	DS-64	12/10	ivp		12/11	12/13
D	P-103/104/107	@Int	T	"	RTH		12/11	12/13
E	P-102/103/107	@Int	T	"	"		12/11	12/13
F	P-102/107/114	@Int	T	"	"		12/11	12/13
G	P-101/102/114	@Int	T	"	"		12/11	12/13
H	P-100/101/114	@Int	T	"	"		12/11	12/13
I	P-99/100/114	@Int	T	"	"		12/11	12/13
J	P-97/99/114	@Int	T	"	"		12/11	12/13
K	P-96/97/114	@Int	T	"	"		12/11	12/13
M	P-95/96/114	@Int	T	"	"		12/11	12/13
N	P-96/114	7' N of SEOS	BO	"	"		12/11	12/13
P	P-1/52/86/116	@Int	T	"	"		12/13	12/13
Q	P-86/87/116	@Int	T	"	"		12/13	12/13
R	P-87/88/116	@Int	T	"	"		12/13	12/13
S	P-88/89/116	@Int	T	"	"		12/13	12/13
T	P-89/90/116	@Int	T	"	"		12/11	12/13
V	P-90/91/116	@Int	T	"	"		12/11	12/13
W	P-91/114/116	@Int	T	"	"		12/11	12/13
X	P-87/116	7' E of WEOS	BO	"	"		12/13	12/13

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: 1001.154

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2I

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	P-120/121	26' W of EEOS	DS-65	12-11-10	TS		12/13	12/13
B	P-122/123	33' E of WEOS	DS-66	"	TS		12/11	12/13
C	P-127/128	44' W of EEOS	DS-67	"	TS		12/11	12/13
D	P-133/134	38' W of EEOS	DS-68	"	TS		12/11	12/13
E	P-92/125	102' W of EEOS	DS-69	"	TS		12/11	12/13
F	P-134/135	23' E of WEOS	DS-70	"	TS		12/11	12/13
G	P-141/142	WEOS	DS-71	"	TS		12/11	12/13
H	P-124/146	10' W of EEOS	DS-72	"	TS	Caps failed PT Test	12/13	12/13
I	P-54/118	Middle of Seam	BO	"	TS		12/13	12/13
J	P-136/136/137	@ Int	T	"	TS		12/11	12/13
K	P-136/137/138	@ Int	T	"	TS		12/11	12/13
M	P-60/148	56' E of WEOS	DS-73	"	TS		12/13	12/14
N	P-60/148/149	@ Int	T	"	TS	CAPPED BY IGS	N/A	N/A
P	P-60/84/149	@ Int	T	"	TS		12/13	12/14
Q	P-84/149	73' E of WEOS	DS-74	"	TS		12/13	12/13
R	P-58/123	6' S of NEOS	BO	"	TS		12/13	12/13
S	P-58/123	12' S of NEOS	BO	"	TS		12/13	12/13
T	P-148/150	SEOS	DS-75	"	TS		12/13	12/14
V	P-116/N3P	P-1/96-152/116	DX-9	12/13	RTH		12/13	12/14
W	P-146/147/151	@Int	T	"	"		12/13	12/13
X	P-147/150/151	@Int	T	"	"		12/13	12/13

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

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-92/125	15' E of WEOS	BO	12/11	RTH		12/11	12/13
B	P-125/126	57' E of WEOS	"	"	"		12/11	12/13
C	P-135/136	57' W of EEOS	"	"	"		12/11	12/13
D	P-52/53/116/117	@ Int	T	"	"		12/13	12/13
E	P-53/54/117/118	@ Int	T	"	"		12/13	12/13
F	P-54/55/118/120	@ Int	T	"	"		12/13	12/13
G	P-55/56/120/121	@ Int	T	"	"		12/13	12/13
H	P-56/57/121/122	@ Int	T	"	"		12/13	12/13
I	P-57/58/122/123	@ Int	T	"	"		12/13	12/13
J	P-58/59/123/124	@ Int	T	"	"		12/13	12/13
K	P-59/60/124/117	@ Int	T	"	"		12/13	12/13
M	P-117/118/119	@ Int	T	"	"		12/13	12/13
N	P-118/119/120	@ Int	T	"	"		12/11	12/13
P	P-138/139	125' W of EEOS	BO	"	"		12/11	12/13
Q	P-139/140	175' W of EEOS	"	"	"		12/11	12/13
R	P-128/140/141	@ Int	T	"	"		12/11	12/13
S	P-141/142/143	@ Int	T	"	"		12/11	12/13
T	P-142/143/144	@ Int	T	"	"		12/11	12/13
V	P-128/142/144	@ Int	T	"	"		12/11	12/13
W	P-128/144/145	@ Int	T	"	"		12/11	12/13
X	P-125	60' W of EEOP	D	"	"		12/11	12/14

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: I001.154

REVIEWED BY: [illegible]

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

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-120/125/126	@ Int	T	12/11	RTH		12/11	12/13
B	P-120/121/126	@ Int	T	"	"		12/11	12/13
C	P-121/126/127	@ Int	T	"	"		12/11	12/13
D	P-121/122/127	@ Int	T	"	"		12/11	12/13
E	P-122/123/127/128	@ Int	T	"	"		12/11	12/13
F	P-123/124/128/145	@ Int	T	"	"		12/11	12/13
G	P-124/145/146	@ Int	T	"	"		12/11	12/13
H	P-145/146/151	@ Int	T	"	"		12/13	12/13
I	P-94/95/114/116	@ Int	T	"	"		12/11	12/13
J	P-94/98/116/117	@ Int	T	"	"		12/11	12/13
K	P-92/98/117/119	@ Int	T	"	"		12/11	12/13
M	P-107/138	P-107/114 7' N of SEOS	DX-7	"	"		12/11	12/13
N	P-92/119/120/125	@ Int	T	"	"		12/11	12/13
P	P-92/16N	@ Int P-92/119/120/125	DX-8	"	"		12/11	12/13
Q	P-60/147/150	@ Int	T	12/13	"		12/13	12/13
R	P-60/148/150	@ Int	T	"	"		12/13	12/14
S	P-60/148/149	@ Int	T	"	"		12/13	12/13
T	P-85/149	Capped Seam	C	"	"		12/13	12/13
V	P-81/149	@ Int	T	"	"		12/13	12/13
W	P-139/140	Ø' WEOS	DS-77	"	"		12/13	12/13
X	P-144/145	Ø WEOS	DS-78	"	"		12/13	12/14

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: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

REVIEWED BY: [illegible]

SHEET NUMBER: 17

DEFECT CODE	DEFECT LOCATION		DEFECT TYPE	DATE LOGGED	CQA MONITOR INITIALS	REMARKS	REPAIR DATE	TEST DATE
	SEAM, PANEL OR REPAIR	LOCATION DESCRIPTION						
A	R40/147	@ SCOS	DS-76	12/13	RTH		12/13	12/14
B								
C								
D								
E								
F								
G								
H								
I								
J								
K								
M								
N								
P								
Q								
R								
S								
T								
V								
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 O

Repair Logs

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/7/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 5382

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	2E	0800	P	AZ	2x4	12	12		RTH	
2	2F	0802	P	"	2x4	12	24		"	
3	2D	0805	DS-9	"	2x4	12	36		"	
4	2C	0810	DS-8	"	2x4	12	48		"	
5	1E	0815	DS-5	"	2x4	12	60		"	
6	2B	0820	DS-6	"	2x4	12	72		"	
7	2A	0830	DS-4	"	2x4	12	84		"	
8	1C	0920	DS-3	"	2x12	28	100/12	DX-1	"	CAPS 1D
9	3B	0925	DX-1	"	2x3	10	22		"	
10	1B	0930	DS-2	"	2x4	12	34		"	
11	1A	0950	DS-1	"	2x4	12	46		"	
12	1F	1100	DS-7	"	2x4	12	58		"	
13	2H	1115	DS-13	"	2x4	12	70		"	
14	1I	1120	DS-11	"	2x4	12	82		"	
15	1G	1130	DS-10	"	2x4	12	94		"	
16	1J	1135	DS-12	"	2x4	12	106		"	
17	1K	1312	DS-14	"	2x4	12	118		"	
18	2I	1320	DS-15	"	2x4	12	130		"	
19	1Q	1330	DS-19	"	2x5	14	144		"	
20	2K	1338	DS-16	"	2x4	12	156		"	
21	1P	1340	DS-18	"	2x4	12	168		"	
22	4A	1349	DS-20	"	2x4	12	180		"	
23	2M	1520	DS-17	"	2x4	12	192		"	
24	4B	1610	DS-21	"	2x4	12	204		"	
25	4D	1621	DS-23	"	2x4	12	216		"	
26	4C	1630	DS-22	"	2x4	12	228		"	
27	4E	1655	DS-24	"	2x4	12	240		"	
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 340

DESTRUCTIVE LENGTH CARRY - OVER: 240

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: 1001.154

DATE OF REPAIR: 12/8/10

PROJECT TITLE: CMS Landfill V Cell 2

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 240'

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	5B	0710	DS-26	BS	2x4	12	252		RTH	
2	5C	0720	DS-27	"	2x4	12	264		"	
3	5E	0745	DS-29	"	2x4	12	276		"	
4	5G	0805	DS-31	"	2x4	12	288		"	
5	5D	0810	DS-28	"	2x4	12	300		"	
6	5F	0820	DS-30	"	2x4	12	312		"	
7	3D	0840	DS-34	"	2x4	12	324		"	
8	6C	1015	P	"	1x2	6	330		"	
9	6D	1040	P	"	1x2	6	336		"	
10	3X	1045	P	"	1x2	6	342		"	
11				"					"	
12	6B	1200	P	"	1x2	6	354		"	
13	6A	1205	P	"	2x3	10	364		"	
14	5X	1210	P	"	2x2	8	372		"	
15	5W	1220	P	"	1x5	12	384		"	
16	5V	1235	P	"	2x5	14	398		"	
17	5T	1240	P	"	2x2	8	406		"	
18	5S	1300	P	"	2x5	14	420		"	
19	5H	1310	DB-32	"	2x4	12	432		"	
20	5R	1320	P	"	2x5	14	446		"	
21	5I	1330	DS-33	"	2x4	12	458		"	
22	5Q	1345	P	"	2x5	14	470/2	DX-2	"	
23	5P	1400	P	"	2x2	8	10		"	
24	7A	1410	P	"	1x2	6	16		"	
25	5N	1420	P	"	1x2	6	22		"	
26	5M	1425	P	"	2x3	10	32		"	
27	5K	1535	P	"	2x5	14	46		"	
28	5J	1550	P	"	2x4	12	58		"	
29	8A	1610	DX-2	"	2x4	12	70		"	
30										

DAILY TOTAL FOR WELDED SEAM: 300

DESTRUCTIVE LENGTH CARRY - OVER: 70'

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/9/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 2

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 70'

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	3A	820	P	BS	2x4	12	82		RTH	
2	2X	0825	P	"	1x3	8	90		"	
3	2W	0830	P	"	1x4	10	100		"	
4	2V	0835	P	"	1x4	10	110		"	
5	2T	0840	P	"	1x4	10	120		"	
6	1N	0843	P	"	1x1	4	124		"	
7	2S	0848	P	"	1x4	10	134		"	
8	2R	0851	P	"	1x4	10	144		"	
9	2Q	0859	P	"	1x3	8	152		"	
10	1M	0915	P	"	1x3	8	160		"	
11	2P	0920	P	"	1x5	12	172		"	
12	2N	0925	P	"	1x5	12	184		"	
13	1OC	0930	P	"	1x5	12	196		"	
14	2G	0933	P	"	1x1	4	200		"	
15	1X	1010	P	"	1x6	14	214		"	
16	1W	1035	P	"	1x6	14	228		"	
17	1V	1045	P	"	1x6	14	242		"	
18	1T	1055	P	"	1x5	12	254		"	
19	1S	1101	P	"	1x6	14	268		"	
20	1R	1110	P	"	1x6	14	282		"	
21	4F	1125	P	"	1x8	18	300		"	CAPS 4G
22	2J	1134	P	"	1x1	4	304		"	
23	1H	1145	P	"	1x1	4	308		"	
24	4H	1330	P	"	1X2	6	314		"	
25	4I	1335	P	"	1X2	6	320		"	
26	4J	1340	P	"	1X3	8	328		"	
27	4K	1345	P	"	1X3	8	336		"	
28	4M	1348	P	"	1X2	6	342		"	
29	4N	1350	P	"	1X2	6	348		"	
30	4P	1355	P	"	1X2	6	354		"	

DAILY TOTAL FOR WELDED SEAM: 284

DESTRUCTIVE LENGTH CARRY - OVER: 354

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12-9-10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY:

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2 of 2

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 354

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	4Q	1405	P	BS	1X2	6	360		wp	
2	4R	1410	P	"	1X2	6	366		wp	
3	4S	1415	P	"	1X3	8	374		wp	
4	5A	1445	P	"	1X4	10	384		wp	
5	4T	1450	P	"	2X3	10	394		wp	
6	4V	1455	P	"	1X3	8	402		wp	
7	4W	1500	P	"	2X4	12	414		wp	
8	4X	1505	P	"	1X2	6	420		wp	
9	3E	1515	P	"	1X1	4	424		wp	
10	3F	1520	P	"	2X2	8	432		wp	
11	3G	1523	P	"	1X2	6	438		wp	
12	10D	1530	P	"	1X2	6	444		wp	
13	3H	1535	2X8	"	2X8	20	464		wp	
14	3I	1540	P	"	1X2	6	470		wp	
15	3J	1545	P	"	1X2	6	476		wp	
16	3K	1550	P	"	2X6	16	480/12	DX4	wp	
17	3M	1600	P	"	2X2	8	20		wp	
18	3N	1615	P	"	1X2	6	26		wp	
19	3P	1620	P	"	1X2	6	32		wp	
20	3Q	1625	P	"	1X3	8	40		wp	
21	3R	1630	P	"	1X3	8	48		wp	
22	3S	1635	P	"	1X2	6	56		wp	
23	3T	1645	P	"	2X2	8	64		wp	
24	3C	1650	P	"	1X1	4	68		wp	
25	3V	1655	P	"	1X3	8	78/86			
26	11J	1715	DX4	"	1X3	8	108/116			
27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 240

DESTRUCTIVE LENGTH CARRY - OVER: 116

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/9/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 29

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	9D	1530	DS-50	IS	1X4	10	10		up	
2	9A	1533	P	"	1X1	4	14		up	
3	7X	1536	P	"	1X1	4	18		up	
4	9B	1540	DS-49	"	2X3	10	28		up	
5	8W	1545	P	"	1X2	6	34		up	
6	7N	1600	DS-46	"	1X3	8	42		up	
7	6I	1605	DS-39	"	2X4	12	54		up	
8	10A	1610	P	"	1X1	4	58		RTH	
9	10B	1613	P	"	1X1	4	62		"	
10	8X	1635	C	"	2X30	64	100/26	DX-5	"	
11	7K	1700	DS-44	"	2X4	12	38		"	
12	7I	1713	DS-42	"	2X4	12	50			
13										
14										
15										
16										
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27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 150

DESTRUCTIVE LENGTH CARRY - OVER: 50

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/9/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY:

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 2

MACHINE NUMBER: 503

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	7R	1159	P	AZ	1X2	6	6		WP	
2	7M	1201	DS-45	"	2X4	12	18		WP	
3	7Q	1205	P	"	2X4	12	30		P"	
4	7W	1210	P	"	2X6	16	46		"	
5	8T	1230	P	"	5X5	20	66		"	
6	8X	1240	P	"	2X2	8	74		"	
7	9K	1300	P	"	2X4	12	86		"	
8	9W	1320	P	"	2x5	14	100		RTH	
9	9V	1330	P	"	2x4	12	112		"	
10	9T	1345	P	"	1x6	14	126		"	
11	9R	1350	P	"	1x3	8	134		"	
12	9S	1405	DS-51	"	2x10	24	140/18	DX-3	"	CAPS 9Q
13	9P	1430	P	"	2x3	10	28		"	
14	9N	1435	P	"	2x3	10	38		"	
15	7T	1440	P	"	1x4	10	48		"	
16	9M	1445	P	"	1x1	4	52		"	
17	10F	1456	P	"	1x2	6	58		"	
18	10G	1458	P	"	1x3	8	66		"	
19	9J	1500	P	"	1x5	12	78		"	
20	7P	1505	DS-47	"	1x4	10	88		"	
21	9I	1510	P	"	2x4	12	100		"	
22	9H	1525	P	"	1x1	4	104		"	
23	9G	1529	P	"	1x2	6	110		"	
24	9F	1532	P	"	2x4	12	122		"	
25	9E	1535	P	"	2x3	10	132		"	
26	9C	1646	P	"	1x4	10	142		"	
27	8V	1650	P	"	1x4	10	152		"	
28	8R	1700	P	"	1x2	6	158		"	
29	8S	1705	P	"	1x1	4	162		"	
30	8Q	1715	P	"	2x5	14	176		"	

DAILY TOTAL FOR WELDED SEAM: 316

DESTRUCTIVE LENGTH CARRY - OVER: 176

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/9/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2 of 2

MACHINE NUMBER: 503

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 172'

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	10H	1720	DX-3	AZ	1x4	10	182		RTH	
2	7V	1725	DS-48	"	1x4	10	192		"	
3	8P	1730	P	"	1x2	6	198		"	
4	8N	1735	P	"	1x3	8	206		"	
5										
6										
7										
8										
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24										
25										
26										
27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 34

DESTRUCTIVE LENGTH CARRY - OVER: (TOTAL 350') 206'

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/10/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [signature]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 2

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 116'

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	11A	0735	P	BS	2x2	8	124		RTH	
2	11B	0745	P	"	2x3	10	134		"	
3	11C	0755	P	"	1x2	6	140		"	
4	11D	0758	P	"	1x2	6	146		"	
5	11E	0800	P	"	1x2	6	152		"	
6	11F	0805	P	"	1x1	4	156		"	
7	11G	0810	P	"	1x2	6	162		"	
8	11H	0815	P	"	1x1	4	166		"	
9	11I	0825	P	"	4x4	16	182		"	
10	10J	0840	C	"	2x22	48	230		"	
11	8C	0855	P	"	1x1	4	234		"	
12	8D	0900	P	"	1x2	6	240		"	
13	8E	0905	P	"	1x2	6	246		"	
14	8F	0910	P	"	1x2	6	252		"	
15	8G	0920	P	"	1x4	10	262		"	
16	8H	0925	P	"	1x2	6	268		"	
17	7J	0930	DS-43	"	1x4	10	278		"	
18	8I	0942	P	"	1x1	4	282		"	
19	8J	0945	P	"	1x1	4	286		"	
20	8K	0947	P	"	1x1	4	290		"	
21	7H	0952	P	"	1x3	8	298		"	
22	7G	0958	P	"	1x3	8	306		"	
23	7F	1008	P	"	1x2	6	312		"	
24	6H	1013	DS-38	"	1x4	10	322		"	
25	6F	1030	DS-36	"	1x5	12	334		"	
26	6E	1034	DS-35	"	1x4	10	344		"	
27	7E	1040	P	"	1x1	4	348		"	
28	7D	1043	P	"	1x1	4	352		"	
29	7C	1047	P	"	1x1	4	356		"	
30	6X	1235	P	"	1x1	4	360		"	

DAILY TOTAL FOR WELDED SEAM: 244

DESTRUCTIVE LENGTH CARRY - OVER: TOTAL (626) 360 (262')

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.164

DATE OF REPAIR: 12/10/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2 of 2

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 360

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	6G	1245	DS-37	BS	1x5	12	372		RTH	
2	6W	1250	P	"	1x1	4	376		"	
3	6V	1252	P	"	1x1	4	380		"	
4	6T	1255	P	"	1x1	4	384		"	
5	6S	1300	P	"	1x1	4	388		"	
6	6R	1305	P	"	1x2	6	394		"	
7	6Q	1307	P	"	1x1	4	398		"	
8	6P	1309	P	"	1x2	6	404		"	
9	6N	1315	P	"	1x3	8	412		"	
10	7B	1330	DS-41	"	1x4	10	422		"	
11	6M	1335	P	"	1x1	4	426		"	
12	6K	1340	P	"	1x4	10	436		"	
13	10K	1345	P	"	1x1	4	440		"	
14	12B	1420	P	"	1x2	6	446		"	
15	12A	1440	P	"	1x2	6	468/474		"	
16	10X	1500	P	"	1x3	8	16/24		"	
17	10W	1510	P	"	2x2	8	46/54		"	
18	12E	1555	P	"	1x2	6	76/82		"	
19	12D	1605	P	"	2x2	8	104/112		"	
20	12C	1615	P	"	1x2	6	134/140		"	
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 128

DESTRUCTIVE LENGTH CARRY - OVER: TOTAL 626' 140 (262')

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/11/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 2

MACHINE NUMBER: 5382

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	12Q	0805	P	BS	1x5	12	274		RTH	
2	12G	0827	P	"	1x2	6	280		"	
3	12P	0832	P	"	1x2	6	286		"	
4	12N	0835	P	"	1x2	6	292		"	
5	13A	0845	DS-62	"	2x4	12	304		"	
6	12H	0850	P	"	2x2	8	312		"	
7	12K	0910	P	"	2x5	14	326		"	
8	12I	0950	P	"	2x3	10	336		"	
9	12M	0957	P	"	1x2	6	342		"	
10	12J	1005	P	"	2x4	12	354		"	
11	10S	1015	P	"	4x4	16	370		"	
12	12F	1045	P	"	1x4	10	380		"	
13	10N	1105	P	"	1x6	14	394		"	
14	11N	1115	DS-54	"	1x4	10	404		"	
15	11M	1125	DS-53	"	1x4	10	414		"	
16	10P	1139	P	"	1x5	12	426		"	
17	10R	1145	P	"	1x3	8	434		"	
18	10T	1400	P	"	2x2	8	442		"	
19	10V	1405	P	"	1x2	6	448		"	
20	11S	1408	DS-58	"	1x4	10	458		"	
21	14E	1412	DS-69	"	1x4	10	468		"	
22	15B	1415	P	"	2x2	8	476		"	
23	15A	1420	P	"	1x2	6	482		"	
24	13B	1440	DS-63	"	1x4	10	990/2	DX-7	"	
25	13N	1445	P	"	1x4	10	12		"	
26	13K	1450	P	"	1x1	4	16		"	
27	13W	1455	P	"	1x4	10	26		"	
28	11R	1500	DB-57	"	1x4	10	36		"	
29	11T	1506	DS-59	"	1x4	10	46		"	
30	11X	1509	P	"	1x4	10	56		"	

DAILY TOTAL FOR WELDED SEAM: 284

DESTRUCTIVE LENGTH CARRY - OVER: 56

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/11/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2 of 2

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 56'

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	13J	1520	P	BS	1x3	8	64		RTH	
2	13I	1523	P	"	1x2	6	70		"	
3	13H	1535	P	"	1x1	4	74		"	
4	13G	1537	P	"	1x2	6	80		"	
5	13F	1542	P	"	1x2	6	86		"	
6	13M	1550	P	"	1x4	10	96		"	
7	12X	1553	P	"	1x2	6	102		"	
8	13D	1555	P	"	1x2	6	108		"	
9	13E	1600	P	"	1x2	6	114		"	
10	11V	1605	DS-60	"	1x4	10	124		"	
11	12W	1610	P	"	1x1	4	128		"	
12	12V	1618	P	"	1x1	4	132		"	
13	12T	1622	P	"	1x2	6	138		"	
14	13C	1628	DS-64	"	1x4	10	148		"	
15	11W	1633	DS-61	"	1x4	10	158		"	
16	12S	1635	P	"	1x2	6	164		"	
17	11Q	1640	DS-56	"	1x4	10	174		"	
18	12R	1645	P	"	1x2	6	180		"	
19	16M	1652	DX-7	"	1x4	10	190		"	
20	10Q	1705	P	"	1x5	12	202		"	
21	11K	1710	DS-52	"	1x4	10	212		"	
22	10M	1720	P	"	2x4	12	224		"	
23										
24										
25										
26										
27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 168

DESTRUCTIVE LENGTH CARRY - OVER: 452' 224

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/11/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [signature]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 2

MACHINE NUMBER: 503

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 206

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	15C	1410	P	IS	1x2	6	212		RTH	
2	14J	1415	P	"	2x2	8	220		"	
3	14K	1420	P	"	1x2	6	226		"	
4	15P	1425	P	"	1x3	8	234		"	
5	15Q	1430	P	"	1x3	8	242		"	
6	15R	1435	P	"	1x4	10	252		"	
7	14D	1440	DS-68	"	1x4	10	262		"	
8	14F	1445	DS-70	"	1x4	10	272		"	
9	14G	1457	DS-71	"	1x5	12	284		"	
10	15V	1505	P	"	2x4	12	296		"	
11	15T	1510	P	"	1x2	6	302		"	
12	15S	1515	P	"	1x2	6	308		"	
13	15W	1520	P	"	1x2	6	314		"	
14	14C	1530	DS-67	"	1x4	10	324		"	
15	16A	1538	P	"	2x4	12	336		"	
16	16B	1546	P	"	1x2	6	342		"	
17	16C	1543	P	"	1x1	4	346		"	
18	16D	1548	P	"	1x2	6	352		"	
19	16E	1600	P	"	2x10	24	376		"	
20	16F	1618	P	"	2x5	14	390		"	
21	16G	1625	P	"	1x2	6	396		"	
22	14B	1630	DS-66	"	1x4	10	406		"	
23	16N	1645	P	"	4x12	32	430/8	DX-8	"	
24	16K	1655	P	"	2x3	10	18		"	
25	15X	1700	P	"	1x1	4	22		"	
26	16J	1707	P	"	1x2	6	28		"	
27	16I	1710	P	"	2x3	10	38		"	
28	13V	1720	P	"	1x6	14	52		"	
29	13T	1725	P	"	1x3	8	60		"	
30	16P	1730	DX-8	"	1x4	10	70		"	

DAILY TOTAL FOR WELDED SEAM: 294

DESTRUCTIVE LENGTH CARRY - OVER: 70

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/11/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 2of2

MACHINE NUMBER: 503

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 70'

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	15N	1735	P	IS	1x3	8	78		RTH	
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
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14										
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16										
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26										
27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 8

DESTRUCTIVE LENGTH CARRY - OVER: 302' 78

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR LOG

PROJECT NUMBER: I001.154

DATE OF REPAIR: 12/13/10

PROJECT TITLE: CMS Landfill V Cell 2I

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 503

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 78'

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	13X	0820	P	IS	1x3	8	86		RTH	
2	13S	0825	P	"	1x4	10	96		"	
3	13R	0830	P	"	1x2	6	102		"	
4	14A	0840	DS-65	"	1x4	10	112		"	
5	14H	0900	DS 72	"	2x12	24	136		"	
6	14W	0905	P	"	1x3	8	144		"	
7	14X	0910	P	"	1x2	6	150		"	
8	16H	0915	P	"	1x2	6	156		"	
9	15M	0930	P	"	1x2	6	162		"	
10	16W	1315	DS-77	"	1x4	10	172		"	
11	16X	1325	DS-78	"	1x4	10	182		"	
12	17A	1430	DS-76	"	1x4	10	192		"	
13	10I	1500	DX-5	"	1x4	10	202		"	
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 124

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: I001.154

DATE OF REPAIR: 12/13/2010

PROJECT TITLE: CMS Landfill V Cell 2

REVIEWED BY: [illegible]

PROJECT LOCATION: Charlotte, North Carolina

SHEET NUMBER: 1 of 1

MACHINE NUMBER: 5382

DESTRUCTIVE CARRY - OVER FROM PREVIOUS LOG: 452'

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	13Q	0810	P	BS	1x2	6	458		RTH	
2	13P	0830	P	"	2x14	32	480/10	DX-9	"	
3	15D	0845	P	"	2x3	10	20		"	
4	15E	0850	P	"	1x3	8	28		"	
5	14V	0855	DX-9	"	1x4	10	38		"	
6	14T	0900	P	"	1x3	8	46		"	
7	15F	0905	P	"	1x3	8	54		"	
8	15G	0910	P	"	1x3	8	62		"	
9	15H	0915	P	"	1x3	8	70		"	
10	15I	0925	P	"	1x2	6	76		"	
11	14R	0930	P	"	1x2	6	82		"	
12	14S	0933	P	"	1x2	6	88		"	
13	15J	0937	P	"	1x2	6	94		"	
14	15K	0943	P	"	1x2	6	100		"	
15	16Q	0950	P	"	1x2	6	106		"	
16	16R	1000	P	"	1x4	10	116		"	
17	14T	1005	DS-75	"	1x4	10	126		"	
18	14M	1010	DS-73	"	1x4	10	136		"	
19	6J	1015	DS-40	"	1x4	10	146		"	
20	16S	1020	P	"	1x1	4	150		"	16S
21	14P	1025	P	"	1x1	4	154		"	
22	14Q	1030	DS-74	"	1x4	10	164		"	
23	16T	1035	P	"	1x4	10	174		"	
24	16V	1040	P	"	1x1	4	178		"	
25	8M	1045	P	"	1x1	4	182		"	
26	10E	1100	P	"	1x1	4	186		"	
27	11P	1110	DS-55	"	1x4	10	196		"	
28										
29										
30										

DAILY TOTAL FOR WELDED SEAM: 224

DESTRUCTIVE LENGTH CARRY - OVER: 196

REPAIR TYPES : P = PATCH, C = CAP, G&W = GRIND & WELD, RS = RECONSTRUCTED SEAM

ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX P

Seam Pressure Test Logs

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/6/16

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-3	P-4	1D	NEOS	AZ	1330	1335	30	29	P	✓		RTH	
2	P-3	P-4	1D	SEOS	"	1331	1336	30	30	P		✓	"	
3	P-2	P-3	NEOS	SEOS	"	1340	1345	30	30	P		✓	"	
4	P-1	P-2	NEOS	1A	"	1358	1403	30	29	P	✓		"	
5	P-1	P-2	1A	SEOS	"	1400	1405	30	28	P		✓	"	
6	P-4	P-5	NEOS	SEOS	"	1410	1415	30	29	P		✓	"	
7	P-5	P-6	NEOS	SEOS	"	1412	1417	30	30	P		✓	"	
8	P-6	P-7	NEOS	SEOS	"	1413	1418	30	30	P		✓	"	
9	P-7	P-8	NEOS	SEOS	"	1425	1430	31	31	P		✓	"	
10	P-8	P-9	NEOS	SEOS	"	1454	1459	31	30	P		✓	"	
11	P-9	P-10	NEOS	2E	"	1456	1501	30	29	P	✓		"	
12	P-10	P-11	NEOS	SEOS	"	1510	1515	30	28	P		✓	"	
13	P-9	P-10	2E	2F	"	1514	1519	30	30	P	✓		"	
14	P-9	P-10	2F	SEOS	"	1520	1525	30	30	P		✓	"	
15	P-11	P-12	NEOS	SEOS	"	1530	1535	30	30	P		✓	"	
16	P-12	P-13	NEOS	SEOS	"	1624	1629	30	29	P		✓	"	
17	P-13	P-14	NEOS	SEOS	"	1625	1630	30	28	P		✓	"	
18	P-14	P-15	NEOS	SEOS	"	1640	1645	30	30	P		✓	"	
19	P-15	P-16	NEOS	SEOS	"	1641	1646	30	30	P		✓	"	
20	P-16	P-17	NEOS	SEOS	"	1724	1729	30	30	P		✓	"	
21	P-17	P-18	NEOS	SEOS	"	1725	1730	31	30	P		✓	"	
22	P-18	P-19	NEOS	SEOS	"	1731	1736	30	29	P		✓	"	
23														
24														
25														

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/7/10

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-2	TI	WEOS	EEOS	AZ	0746	0751	30	30	P		✓	RTH	
2	P-3	TI	WEOS	EEOS	"	0747	0752	30	29	P		✓	"	
3	P-4	TI	WEOS	EEOS	"	0748	0753	30	30	P		✓	"	
4	P-5	TI	WEOS	EEOS	"	0749	0754	31	30	P		✓	"	
5	P-6	TI	WEOS	EEOS	"	0800	0805	30	29	P		✓	"	
6	P-7	TI	WEOS	EEOS	"	0801	0806	30	29	P		✓	"	
7	P-8	TI	WEOS	EEOS	"	0803	0808	30	30	P		✓	"	
8	P-9	TI	WEOS	EEOS	"	0804	0809	30	29	P		✓	"	
9	P-10	TI	WEOS	EEOS	"	0823	0828	30	29	P		✓	"	
10	P-11	TI	WEOS	EEOS	"	0825	0830	30	29	P		✓	"	
11	P-12	TI	WEOS	EEOS	"	0840	0845	30	29	P		✓	"	
12	P-13	TI	WEOS	EEOS	"	0900	0905	30	29	P		✓	"	
13	P-14	TI	WEOS	EEOS	"	0907	0912	30	29	P		✓	"	
14	P-15	TI	WEOS	EEOS	"	0920	0925	30	30	P		✓	"	
15	P-16	TI	WEOS	EEOS	"	0927	0932	30	29	P		✓	"	
16	P-17	TI	WEOS	EEOS	"	0928	0933	30	30	P		✓	"	
17	P-18	TI	WEOS	EEOS	"	0934	0939	30	29	P		✓	"	
18	P-19	TI	WEOS	EEOS	"	0936	0941	30	29	P		✓	"	
19	P-19	P-20	NEOS	SEOS	"	1025	1030	30	29	P		✓	"	
20	P-20	P-21	NEOS	SEOS	"	1026	1031	30	30	P		✓	"	
21	P-21	P-22	NEOS	SEOS	"	1027	1032	30	29	P		✓	"	
22	P-22	P-23	NEOS	SEOS	"	1029	1033	30	30	P		✓	"	
23	P-23	P-24	NEOS	SEOS	"	1100	1106	30	30	P		✓	"	
24	P-24	P-25	NEOS	SEOS	"	1101	1106	30	30	P		✓	"	
25	P-25	P-26	NEOS	SEOS	"	1124	1129	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/7/10

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-26	P 27	NEOS	SEOS	AZ	1350	1355	30	29	P		✓	RTH	
2	P-27	P 28	NEOS	SEOS	"	1405	1410	30	29	P		✓	RTH	
3	P-27	TI	EEOS	4X	"	1420	1425	30	31	P	✓		"	
4	P-27	TI	4X	WEOS	"	1425	1430	30	30	P		✓	"	
5	P-26	TI	EEOS	4V	"	1436	1440	31	30	P	✓		"	
6	P-26	TI	4V	WEOS	"	1438	1443	30	30	P		✓	"	
7	P-25	P-29	NEOS	SEOS	"	1442	1446	30	28	P		✓	"	
8	P-29	P-30	NEOS	SEOS	"	1447	1452	30	29	P		✓	"	
9	P-25	TI	EEOS	5A	"	1510	1515	31	30	P	✓		"	
10	P-25	TI	5A	4S	"	1512	1517	30	29	P	✓		"	
11	P 25	TI	4S	WEOS	"	1513	1518	30	30	P		✓	"	
12	P 30	P-31	NEOS	SEOS	"	1530	1535	30	30	P		✓	"	
13	P-31	P 32	NEOS	SEOS	"	1532	1537	30	29	P		✓	"	
14	P-32	P 33	NEOS	SEOS	"	1550	1555	30	29	P		✓	"	
15	P-33	P 34	NEOS	SEOS	"	1551	1556	30	30	P		✓	"	
16	P-35	P-36	WEOS	EEOS	"	1640	1645	30	30	P		✓	"	
17	P-36	P 37	WEOS	EEOS	"	1642	1647	30	29	P		✓	"	
18	P-37	P-38	WEOS	EEOS	"	1644	1649	36	29	P		✓	"	
19														
20														
21														
22														
23														
24														
25														

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/8/10

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 3

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-34	P-51	NEOS	SEOS	AZ	0840	0845	30	30	P		✓	RTH	
2	P-35	P-51	NEOS	3X	"	0903	0908	30	29	P	✓		"	
3	P-36	P-51	NEOS	SEOS	"	0904	0909	30	30	P		✓	"	
4	P-35	P-51	3X	SEOS	"	0905	0910	30	29	P		✓	"	
5	P-37	P-51	NEOS	SEOS	"	0910	0915	30	30	P		✓	"	
6	P-38	P-51	NEOS	SEOS	"	0926	0931	30	30	P		✓	"	
7	P-39	P-51	NEOS	SEOS	"	0958	1003	30	30	P		✓	"	
8	P-38	P-39	SEOS	SEOS	"	1000	1005	30	30	P		✓	"	
9	P-40	P-51	NEOS	SEOS	"	1001	1006	30	29	P		✓	"	
10	P-39	P-40	WEOS	EEOS	"	1002	1007	30	30	P		✓	"	
11	P-41	P-51	NEOS	SEOS	"	1009	1014	30	30	P		✓	"	
12	P-40	P-41	WEOS	EEOS	"	1010	1015	30	29	P		✓	"	
13	P-42	P-51	NEOS	SEOS	"	1014	1019	30	30	P		✓	"	
14	P-41	P-42	WEOS	EEOS	"	1020	1025	30	30	P		✓	"	
15	P-42	P-43	WEOS	EEOS	"	1022	1027	30	30	P		✓	"	
16	P-43	P-51	NEOS	SEOS	"	1035	1040	30	30	P		✓	"	
17	P-43	P-44	WEOS	EEOS	"	1050	1055	30	28	P		✓	"	
18	P-44	P-45	WEOS	EEOS	"	1210	1215	30	30	P		✓	"	
19	P-44	P-51	NEOS	SEOS	"	1218	1223	30	30	P		✓	"	
20	P-45	P-51	NEOS	SEOS	"	1231	1236	31	31	P		✓	"	
21	P-45	P-46	WEOS	EEOS	"	1239	1244	31	31	P		✓	"	
22	P-46	P-51	NEOS	SEOS	"	1240	1245	32	31	P		✓	"	
23	P-46	P-47	WEOS	EEOS	"	1242	1247	31	31	P		✓	"	
24	P-47	P-51	NEOS	7A	"	1243	1248	30	29	P	✓		"	
25	P-47	P-51	SEOS	7A	"	1250	1255	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/8/10

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 3

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-49	P-50	WEOS	EEOS	AZ	1251	1256	31	31	P		✓	RTH	
2	P-47	P-49	WEOS	5K	"	1252	1257	31	31	P	✓		"	
3	P-47	P-50	EEOS	WEOS	"	1258	1303	30	30	P		✓	"	
4	P-50	P-51	NEOS	SEOS	"	1300	1305	31	31	P		✓	"	
5	P-47	P-49	5K	EEOS	"	1310	1315	30	30	P		✓	"	
6	P-48	P-49	WEOS	EEOS	"	1311	1316	32	32	P		✓	"	
7	P-47	P-48	WEOS	EEOS	"	1312	1317	30	30	P		✓	"	
8	P-52	P-53	WEOS	EEOS	"	1344	1349	31	31	P		✓	"	
9	P-53	P-54	WEOS	EEOS	"	1345	1350	30	30	P		✓	"	
10	P-54	P-55	WEOS	EEOS	"	1354	1359	30	30	P		✓	"	
11	P-55	P-56	WEOS	EEOS	"	1356	1401	30	30	P		✓	"	
12	P-56	P-57	WEOS	EEOS	"	1408	1413	30	30	P		✓	"	
13	P-57	P-58	WEOS	EEOS	"	1409	1414	30	29	P		✓	"	
14	P-58	P-59	WEOS	EEOS	"	1410	1415	30	30	P		✓	"	
15	P-59	P-60	WEOS	EEOS	"	1415	1420	30	29	P		✓	"	
16	P-1	P-52	WEOS	EEOS	"	1426	1431	31	30	P		✓	"	
17	P-2	P-52	EEOS	WEOS	"	1427	1432	30	30	P		✓	"	
18	P-3	P-52	WEOS	EEOS	"	1435	1440	30	30	P		✓	"	
19	P-4	P-52	EEOS	WEOS	"	1443	1448	30	30	P		✓	"	
20	P-5	P-52	WEOS	EEOS	"	1530	1535	30	29	P		✓	"	
21	P-6	P-52	EEOS	WEOS	"	1531	1536	30	30	P		✓	"	
22	P-7	P-52	WEOS	EEOS	"	1541	1546	30	29	P		✓	"	
23	P-8	P-52	EEOS	WEOS	"	1542	1547	30	29	P		✓	"	
24	P-9	P-52	WEOS	EEOS	"	1548	1553	30	30	P		✓	"	
25	P-10	P-52	EEOS	WEOS	"	1549	1554	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/8/10

REVIEWED BY: [illegible]

SHEET NUMBER: 3 of 3

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-11	P-52	WEDS	EEDS	AZ	1553	1558	31	30	P		✓	RTT	
2	P-12	P-52	EEDS	WEDS	"	1554	1559	30	30	P		✓	"	
3	P-13	P-52	WEDS	EEDS	"	1600	1605	30	29	P		✓	"	
4	P-14	P-52	EEDS	WEDS	"	1601	1606	30	30	P		✓	"	
5	P-15	P-52	WEDS	EEDS	"	1607	1612	30	30	P		✓	"	
6	P-16	P-52	EEDS	WEDS	"	1608	1613	30	29	P		✓	"	
7	P-17	P-52	WEDS	EEDS	"	1614	1619	30	30	P		✓	"	
8	P-18	P-52	EEDS	WEDS	"	1615	1620	30	30	P		✓	"	
9	P-61	P-62	EEDS	WEDS	"	1624	1629	30	30	P		✓	"	
10	P-62	P-63	EEDS	WEDS	"	1632	1637	30	29	P		✓	"	
11														
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ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/9/10

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	P-50	P-68	WEOS	EEOS	MC	0725	0730	30	30	P		✓	RTH	
2	P-68	P-69	WEOS	EEOS	"	0726	0731	31	30	P		✓	"	
3	P-69	P-70	WEOS	EEOS	"	0733	0738	30	29	P		✓	"	
4	P-70	P-71	WEOS	EEOS	"	0734	0739	30	30	P		✓	"	
5	P-71	P-72	WEOS	EEOS	"	0742	0747	30	30	P		✓	"	
6	P-72	P-73	WEOS	EEOS	"	0743	0748	30	29	P		✓	"	
7	P-73	P-74	WEOS	EEOS	"	0750	0755	31	31	P		✓	"	
8	P-74	P-75	WEOS	EEOS	"	0751	0756	31	30	P		✓	"	
9	P-75	P-76	WEOS	EEOS	"	0754	0759	30	29	P		✓	"	
10	P-76	P-77	WEOS	EEOS	"	0755	0800	30	30	P		✓	"	
11	P-77	P-78	8T	EEOS	"	0810	0815	30	30	P	✓		"	
12	P-77	P-78	8T	WEOS	"	0822	0827	30	30	P		✓	"	
13	P-78	P-79	WEOS	EEOS	"	0835	0840	30	29	P		✓	"	
14	P-79	P-80	WEOS	EEOS	"	0845	0850	30	30	P		✓	"	
15	P-80	P-81	WEOS	EEOS	"	0846	0851	30	30	P		✓	"	
16	P-63	P-64	EEOS	8V	"	0919	0924	30	28	P	✓		"	
17	P-63	P-64	8V	WEOS	"	0926	0931	31	30	P		✓	"	
18	P-64	P-65	EEOS	WEOS	"	0920	0925	31	36	P		✓	"	
19	P-65	P-66	EEOS	7R	"	0933	0938	30	30	P	✓		"	
20	P-65	P-66	7R	7Q	"	0932	0937	31	29	P	✓		"	
21	P-65	P-66	7Q	8X	"	0940	0945	30	30	P	✓		"	
22	P-66	P-67	7W	8W	"	0945	0950	30	30	P	✓		"	
23	P-66	P-67	7W	EEOS	"	0958	1003	31	30	P	✓		"	
24	P-65	P-66	8X	10B	"	1010	1015	31	31	P	✓		"	
25	P-65	P-66	10B	10A		1015	1020	30	30	P	✓		"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2!

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/9/10

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	P-65	P-66	10A	WEDS	DC	1022	1027	30	30	P		✓	RTH	
2	P-20	TI	EEDS	WEDS	"	1035	1040	30	30	P		✓	"	
3	P-21	TI	WEDS	EEDS	"	1036	1041	30	30	P		✓	"	
4	P-22	TI	4K	WEDS	"	1055	1100	30	30	P	✓		"	
5	P-22	TI	4K	EEDS	"	1056	1101	30	30	P		✓	"	
6	P-23	TI	4N	WEDS	"	1058	1103	30	29	P	✓		"	
7	P-23	TI	4N	EEDS	"	1100	1105	30	30	P		✓	"	
8	P-24	TI	4Q	WEDS	"	1101	1106	30	30	P	✓		"	
9	P-24	TI	4Q	EEDS	"	1103	1108	30	29	P		✓	"	
10	P-28	TI	3G	WEDS	"	1128	1133	30	30	P	✓		"	
11	P-28	TI	3G	10D	"	1129	1134	30	29	P	✓		"	
12	P-29	TI	3I	WEDS	"	1140	1145	30	30	P	✓		"	
13	P-29	TI	3I	EEDS	"	1141	1146	30	30	P		✓	"	
14	P-30	TI	3K	WEDS	"	1148	1153	30	30	P	✓		"	
15	P-30	TI	3K	EEDS	"	1149	1154	30	30	P		✓	"	
16	P-28	TI	10D	EEDS	"	1134	1139	30	28	P		✓	"	
17	P-31	TI	3N	EEDS	"	1155	1200	30	29	P	✓		"	
18	P-31	TI	3N	WEDS	"	1156	1201	30	30	P		✓	"	
19	P-32	TI	3Q	EEDS	"	1202	1207	31	30	P	✓		"	
20	P-32	TI	3Q	WEDS	"	1203	1208	30	29	P		✓	"	
21	P-33	TI	3S	EEDS	"	1209	1214	30	29	P	✓		"	
22	P-33	TI	3S	WEDS	"	1210	1215	30	30	P		✓	"	
23	P-34	TI	WEDS	EEDS	"	1216	1221	31	30	P		✓	"	
24	P-67	P-83	9C	WEDS	"	1240	1245	30	30	P	✓		"	
25	P-67	P-83	9C	EEDS	"	1241	1246	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/9/10

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		COA MONITOR INITIALS	REMARKS
	FIRST PANEL	SECOND PANEL	START POINT	FINISH POINT		START TIME	FINISH TIME	INITIAL PRESSURE	FINAL PRESSURE		NO	YES		
1	P-66	P-67	SW	7N	DC	1250	1255	30	30	P	✓		RTH	
2	P-66	P-67	7N	WEDS	"	1256	1301	30	30	P		✓	"	
3	P-67	P-82	EEDS	WEDS	"	1303	1308	30	30	P		✓	"	
4	P-82	P-84	EEDS	WEDS	"	1310	1315	30	30	P		✓	"	
5	P-82	P-83	NEDS	SEDS	"	1311	1316	30	30	P		✓	"	
6	P-83	P-84	WEDS	EEDS	"	1317	1322	30	29	P		✓	"	
7	P-84	P-85	NEDS	SEDS	"	1325	1330	30	30	P		✓	"	
8	P-81	P-85	SEDS	NEDS	"	1326	1331	30	30	P		✓	"	
9	P-80	P-85	EEDS	WEDS	"	1333	1338	30	30	P		✓	"	
10	P-80	P-83	SEDS	NEDS	"	1334	1339	30	30	P		✓	"	
11	P-67	P-79	SEDS	NEDS	"	1340	1345	30	30	P		✓	"	
12	P-66	P-78	SEDS	NEDS	"	1348	1353	30	30	P		✓	"	
13	P-66	P-75	NEDS	SEDS	"	1356	1401	31	31	P		✓	"	
14	P-65	P-76	SEDS	NEDS	"	1357	1402	30	30	P		✓	"	
15	P-65	P-77	NEDS	SEDS	"	1358	1403	30	30	P		✓	"	
16	P-63	P-74	NEDS	SEDS	"	1400	1405	30	30	P		✓	"	
17	P-62	P-73	SEDS	NEDS	"	1401	1406	30	30	P		✓	"	
18	P-62	P-72	NEDS	SEDS	"	1402	1407	30	30	P		✓	"	
19	P-61	P-72	SEDS	NEDS	"	1410	1415	30	29	P		✓	"	
20	P-61	P-71	NEDS	SEDS	"	1411	1416	30	30	P		✓	"	
21	P-51	P-71	SEDS	NEDS	"	1412	1417	30	28	P		✓	"	
22	P-51	P-70	SEDS	NEDS	"	1413	1418	30	30	P		✓	"	
23	P-51	P-69	SEDS	WEDS	"	1418	1423	30	30	P		✓	"	
24	P-51	P-68	SEDS	WEDS	"	1419	1424	30	30	P		✓	"	
25	P-51	P-61	EEDS	WEDS	"	1416	1421	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/9/10

REVIEWED BY: [illegible]

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	P-34	P-61	WEOS	EEOS	DC	1417	1422	31	31	P		✓	RTH	
2	P-33	P-61	WEOS	EEOS	"	1418	1423	31	31	P		✓	RTH	
3	P-32	P-61	EEOS	WEOS	"	1420	1425	30	30	P		✓	"	
4	P-31	P-61	EEOS	WEOS	"	1421	1426	31	30	P		✓	"	
5	P-30	P-61	WEOS	EEOS	"	1455	1500	30	30	P		✓	"	
6	P-29	P-61	EEOS	WEOS	"	1456	1501	30	30	P		✓	"	
7	P-28	P-61	WEOS	EEOS	"	1507	1512	30	29	P		✓	"	
8	P-27	P-61	EEOS	WEOS	"	1508	1513	30	30	P		✓	"	
9	P-26	P-61	WEOS	EEOS	"	1514	1519	31	30	P		✓	"	
10	P-25	P-61	EEOS	WEOS	"	1515	1520	30	29	P		✓	"	
11	P-24	P-61	WEOS	EEOS	"	1522	1527	30	30	P		✓	"	
12	P-23	P-61	EEOS	WEOS	"	1523	1528	30	30	P		✓	"	
13	P-22	P-61	WEOS	EEOS	"	1529	1534	30	30	P		✓	"	
14	P-21	P-61	EEOS	WEOS	"	1530	1535	30	30	P		✓	"	
15	P-20	P-61	WEOS	EEOS	"	1535	1540	30	29	P		✓	"	
16	P-52	P-61	SEOS	NEOS	"	1536	1541	30	29	P		✓	"	
17	P-53	P-62	SEOS	NEOS	"	1540	1545	30	29	P		✓	"	
18	P-54	P-63	NEOS	SEOS	"	1541	1546	30	30	P		✓	"	
19	P-55	P-64	SEOS	NEOS	"	1547	1552	30	30	P		✓	"	
20	P-56	P-65	NEOS	SEOS	"	1548	1553	30	30	P		✓	"	
21	P-57	P-66	SEOS	NEOS	"	1555	1600	30	30	P		✓	"	
22	P-58	P-67	NEOS	SEOS	"	1556	1601	30	30	P		✓	"	
23	P-59	P-82	SEOS	NEOS	"	1604	1609	30	30	P		✓	"	
24	P-60	P-84	NEOS	SEOS	"	1605	1610	30	30	P		✓	"	
25														

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/16/10

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-86	P-87	SEOS	NEOS	DC	1325	1330	30	30	P		✓	RTH	
2	P-1	P-86	SEOS	NEOS	"	1330	1335	30	30	P		✓	"	
3	P-88	P-89	10M	SEOS	"	1334	1339	30	29	P	✓		"	
4	P-88	P-89	10M	NEOS	"	1350	1355	30	30	P		✓	"	
5	P-87	P-88	10Q	SEOS	"	1356	1401	30	30	P	✓		"	
6	P-87	P-88	10Q	10P	"	1358	1403	30	30	P	✓		"	
7	P-87	P-88	10N	10P	"	1404	1409	30	29	P	✓		"	
8	P-87	P-88	10N	NEOS	"	1405	1410	30	30	P		✓	"	
9	P-90	P-91	10S	SEOS	"	1411	1416	30	30	P	✓		"	
10	P-90	P-91	NEOS	10S	"	1418	1423	30	30	P		✓	"	
11	P-89	P-90	NEOS	10R	"	1415	1420	30	30	P	✓		"	
12	P-89	P-90	10R	SEOS	"	1429	1434	30	29	P		✓	"	
13	P-92	P-98	WEOS	EEOS	"	1448	1453	30	30	P		✓	"	
14	P-93	P-98	SEOS	NEOS	"	1449	1454	30	30	P		✓	"	
15	P-92	P-93	EEOS	WEOS	"	1457	1502	30	30	P		✓	"	
16	P-94	P-98	EEOS	WEOS	"	1458	1503	30	30	P		✓	"	
17	P-93	P-94	WEOS	EEOS	"	1505	1510	31	30	P		✓	"	
18	P-94	P-95	EEOS	WEOS	"	1504	1509	30	29	P		✓	"	
19	P-95	P-96	EEOS	WEOS	"	1508	1513	31	30	P		✓	"	
20	P-96	P-97	EEOS	WEOS	"	1520	1525	30	30	P		✓	"	
21	P-97	P-99	EEOS	WEOS	"	1521	1526	30	30	P		✓	"	
22	P-99	P-100	EEOS	WEOS	"	1523	1528	30	29	P		✓	"	
23	P-100	P-101	EEOS	WEOS	"	1531	1536	31	30	P		✓	"	
24	P-101	P-102	EEOS	WEOS	"	1532	1537	30	29	P		✓	"	
25	P-102	P-107	EEOS	WEOS	"	1540	1545	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/10/10

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-104	P-107	EEOS	WEOS	DC	1541	1546	30	30	P		✓	RTH	
2	P-103	P-107	NEOS	SEOS	"	1542	1547	30	30	P		✓	"	
3	P-102	P-103	EEOS	WEOS	"	1600	1605	30	30	P		✓	"	
4	P-103	P-104	EEOS	WEOS	"	1601	1606	30	30	P		✓	"	
5	P-104	P-105	EEOS	WEOS	"	1606	1611	30	30	P		✓	"	
6	P-105	P-106	EEOS	WEOS	"	1607	1612	30	29	P		✓	"	
7	P-106	P-108	EEOS	WEOS	"	1608	1613	30	30	P		✓	"	
8	P-108	P-109	EEOS	WEOS	"	1614	1619	31	30	P		✓	"	
9	P-109	P-110	EEOS	WEOS	"	1615	1620	30	30	P		✓	"	
10	P-110	P-111	EEOS	WEOS	"	1623	1628	30	30	P		✓	"	
11	P-110	P-112	EEOS	WEOS	"	1625	1630	30	29	P		✓	"	
12	P-111	P-112	EEOS	WEOS	"	1626	1631	30	29	P		✓	"	
13	P-112	P-113	EEOS	12G	"	1634	1639	30	30	P	✓		"	
14	P-112	P-113	12G	WEOS	"	1635	1640	30	29	P		✓	"	
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ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/11/10

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 5

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-91	P-114	NEOS	SEOS	DC	0715	0720	31	30	P		✓	RTH	
2	P-91	P-115	NEOS	SEOS	"	0716	0721	30	29	P		✓	"	
3	P-91	P-112	SEOS	NEOS	"	0717	0722	30	30	P		✓	"	
4	P-112	P-115	WEOS	EEOS	"	0725	0730	30	30	P		✓	"	
5	P-111	P-115	NEOS	SEOS	"	0726	0731	30	30	P		✓	"	
6	P-114	P-115	WEOS	EEOS	"	0727	0732	30	29	P		✓	"	
7	P-91	P-113	SEOS	NEOS	"	0733	0738	30	29	P		✓	"	
8	P-110	P-114	NEOS	SEOS	"	0739	0744	30	30	P		✓	"	
9	P-109	P-114	NEOS	SEOS	"	0740	0745	30	30	P		✓	"	
10	P-108	P-114	NEOS	SEOS	"	0741	0746	30	30	P		✓	"	
11	P-106	P-114	NEOS	SEOS	"	0748	0753	30	29	P		✓	"	
12	P-105	P-114	SEOS	NEOS	"	0749	0754	30	29	P		✓	"	
13	P-104	P-114	NEOS	SEOS	"	0750	0755	30	30	P		✓	"	
14	P-107	P-114	SEOS	NEOS	"	0758	0803	30	30	P		✓	"	
15	P-102	P-114	SEOS	NEOS	"	0759	0804	31	30	P		✓	"	
16	P-101	P-114	NEOS	SEOS	"	0800	0805	30	29	P		✓	"	
17	P-100	P-114	SEOS	NEOS	"	0810	0815	30	30	P		✓	"	
18	P-99	P-114	SEOS	NEOS	"	0811	0816	30	30	P		✓	"	
19	P-97	P-114	NEOS	SEOS	"	0812	0817	30	30	P		✓	"	
20	P-96	P-114	SEOS	13N	"	0819	0824	30	30	P	✓		"	
21	P-95	P-114	NEOS	SEOS	"	0820	0825	30	29	P		✓	"	
22	P-96	P-114	13N	NEOS	"	0824	0829	30	30	P		✓	"	
23	P-114	P-116	WEOS	EEOS	"	0838	0843	30	30	P		✓	"	
24	P-116	P-117	WEOS	EEOS	"	0839	0844	30	29	P		✓	"	
25	P-117	P-119	WEOS	EEOS	"	0840	0845	31	30	P		✓		

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/11/10

REVIEWED BY: ☆

SHEET NUMBER: 2 of 5

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-118	P-119	SEOS	NEOS	DC	0854	0859	30	30	P		✓	RTH	
2	P-118	P-120	WEOS	EEOS	"	0856	0901	30	30	P		✓	"	
3	P-117	P-118	WEOS	EEOS	"	0903	0908	30	30	P		✓	"	
4	P-120	P-121	EEOS	WEOS	"	0908	0913	30	29	P		✓	"	
5	P-122	P-123	EEOS	WEOS	"	0909	0914	30	30	P		✓	"	
6	P-121	P-122	EEOS	WEOS	"	0910	0915	30	30	P		✓	"	
7	P-123	P-124	EEOS	WEOS	"	0915	0920	31	30	P		✓	"	
8	P-86	P-116	EEOS	WEOS	"	0929	0934	30	29	P		✓	"	
9	P-87	P-116	EEOS	WEOS	"	0930	0935	30	30	P		✓	"	
10	P-88	P-116	WEOS	EEOS	"	0936	0941	30	30	P		✓	"	
11	P-89	P-116	EEOS	13X	"	0937	0942	30	29	P	✓		"	
12	P-89	P-116	WEOS	13X	"	0938	0943	30	30	P		✓	"	
13	P-90	P-116	WEOS	EEOS	"	0950	0955	30	29	P		✓	"	
14	P-91	P-116	EEOS	WEOS	"	0951	0956	30	29	P		✓	"	
15	P-125	P-126	EEOS	15B	"	0959	1004	30	29	P	✓		"	
16	P-126	P-127	EEOS	WEOS	"	1000	1005	30	30	P		✓	"	
17	P-127	P-128	EEOS	WEOS	"	1001	1006	30	28	P		✓	"	
18	P-92	P-125	15A	WEOS	"	1030	1035	30	30	P	✓		"	
19	P-92	P-125	15A	EEOS	"	1031	1036	30	30	P		✓	"	
20	P-125	P-126	15B	WEOS	"	1040	1045	30	29	P		✓	"	
21	P-129	P-130	EEOS	WEOS	"	1102	1107	31	30	P		✓	"	
22	P-130	P-131	EEOS	WEOS	"	1103	1108	30	30	P		✓	"	
23	P-131	P-132	EEOS	WEOS	"	1104	1109	30	29	P		✓	"	
24	P-132	P-133	EEOS	WEOS	"	1114	1119	31	30	P		✓	"	
25	P-133	P-134	EEOS	WEOS	"	1115	1120	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/11/10

REVIEWED BY: [illegible]

SHEET NUMBER: 3 of 5

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-134	P-135	EEDS	WEDS	DC	1116	1121	30	30	P		✓	RTH	
2	P-136	P-137	SEDS	NEDS	"	1124	1129	31	30	P		✓	"	
3	P-135	P-136	EEDS	15C	"	1123	1128	30	30	P	✓		"	
4	P-135	P-137	WEDS	EEDS	"	1125	1130	30	29	P		✓	"	
5	P-137	P-138	WEDS	EEDS	"	1135	1140	30	30	P		✓	"	
6	P-136	P-138	EEDS	WEDS	"	1136	1141	30	30	P		✓	"	
7	P-135	P-136	15C	WEDS	"	1140	1145	30	29	P		✓	"	
8	P-138	P-139	15P	WEDS	"	1326	1331	30	30	P	✓		"	
9	P-138	P-139	15P	EEDS	"	1328	1333	30	30	P		✓	"	
10	P-139	P-140	15Q	EEDS	"	1334	1339	30	29	P	✓		"	
11	P-139	P-140	15Q	WEDS	"	1335	1340	30	28	P		✓	"	
12	P-128	P-140	EEDS	WEDS	"	1353	1358	30	29	P		✓	"	
13	P-140	P-141	WEDS	EEDS	"	1354	1359	30	30	P		✓	"	
14	P-128	P-141	WEDS	EEDS	"	1400	1405	30	29	P		✓	"	
15	P-141	P-142	WEDS	EEDS	"	1401	1406	30	29	P		✓	"	
16	P-141	P-143	WEDS	EEDS	"	1406	1411	30	30	P		✓	"	
17	P-142	P-143	SEDS	NEDS	"	1407	1412	30	30	P		✓	"	
18	P-142	P-144	EEDS	WEDS	"	1412	1417	30	29	P		✓	"	
19	P-143	P-144	WEDS	EEDS	"	1413	1418	30	30	P		✓	"	
20	P-128	P-142	EEDS	WEDS	"	1415	1420	30	29	P		✓	"	
21	P-128	P-144	WEDS	EEDS	"	1418	1423	30	30	P		✓	"	
22	P-144	P-145	WEDS	EEDS	"	1425	1430	30	30	P		✓	"	
23	P-128	P-145	WEDS	EEDS	"	1426	1431	30	30	P		✓	"	
24	P-145	P-146	NEDS	SEDS	"	1430	1435	30	30	P		✓	"	
25	P-124	P-145	SEDS	NEDS	"	1431	1436	30	30	P		✓	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/11/10

REVIEWED BY: [illegible]

SHEET NUMBER: 4 of 5

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-123	P-128	NEOS	SEOS	DC	1440	1445	30	30	P		✓	RTH	
2	P-122	P-127	SEOS	NEOS	"	1441	1446	30	29	P		✓	"	
3	P-121	P-127	NEOS	SEOS	"	1446	1451	30	30	P		✓	"	
4	P-121	P-126	SEOS	NEOS	"	1447	1452	31	31	P		✓	"	
5	P-120	P-126	NEOS	SEOS	"	1454	1459	31	29	P		✓	"	
6	P-120	P-125	SEOS	NEOS	"	1455	1500	30	29	P		✓	"	
7	P-92	P-119	NEOS	SEOS	"	1501	1506	30	30	P		✓	"	
8	P-98	P-117	SEOS	NEOS	"	1502	1507	30	29	P		✓	"	
9	P-94	P-116	SEOS	NEOS	"	1508	1513	30	30	P		✓	"	
10	P-52	P-116	SEOS	NEOS	"	1520	1525	30	29	P		✓	"	
11	P-53	P-117	NEOS	SEOS	"	1521	1526	30	30	P		✓	"	
12	P-54	P-118	NEOS	14I	"	1527	1532	30	30	P	✓		TS	
13	P-54	P-118	14I	SEOS	"	1528	1533	30	30	P		✓	TS	
14	P-55	P-120	SEOS	NEOS	"	1534	1539	30	30	P		✓	TS	
15	P-56	P-121	NEOS	SEOS	"	1535	1540	30	29	P		✓	TS	
16	P-57	P-122	SEOS	SEOS	"	1544	1549	30	30	P		✓	TS	
17	P-58	P-123	NEOS	14R	"	1545	1550	30	29	P	✓		TS	
18	P-58	P-123	14R	14S	"	1551	1556	30	30	P	✓		TS	
19	P-58	P-123	14S	SEOS	"	1552	1557	30	29	P		✓	TS	
20	P-59	P-124	SEOS	NEOS	"	1558	1603	30	29	P		✓	TS	
21	P-60	P-147	NEOS	SEOS	"	1559	1604	30	30	P		✓	TS	
22	P-150	P-151	NEOS	SEOS	"	1607	1612	30	29	P		✓	TS	
23	P-146	P-147	NEOS	SEOS	"	1608	1613	30	30	P		✓	TS	
24	P-124	P-147	NEOS	SEOS	"	1615	1620	31	31	P		✓	TS	
25	P-124	P-146	14H	NEOS	"	1630	1635	31	30	P		✓	TS	14H-SEOS is Capped

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12-11-10

REVIEWED BY: [illegible]

SHEET NUMBER: 5 of 5

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-124	P-146	EEOS	14 11	DC	1635	1640	30	25	F		✓	TS	CAP-14H
2	P-146	P-151	EEOS	WEOS	"	1647	1652	30	30	P		✓	TS	covers to end of seam
3	P-147	P-151	WEOS	EEOS	"	1648	1653	30	30	P		✓	TS	
4	P-147	P-150	WEOS	EEOS	"	1704	1709	30	30	P		✓	TS	
5	P-145	P-151	NEOS	SEOS	"	1711	1716	30	30	P		✓	TS	
6	P-60	P-150	EEOS	WEOS	"	1720	1725	30	30	P		✓	TS	
7	P-149	P-150	NEOS	SEOS	"	1726	1731	30	31	P		✓	TS	
8														
9														
10														
11														
12														
13														
14														
15														
16														
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18														
19														
20														
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23														
24														
25														

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM PRESSURE TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF PRESSURE TEST: 12/13/10

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-119	P-120	NEOS	SEOS	DC	720	725	30	30	P		✓	[illegible]	
2	P-60	P-149	WEOS	EEOS	"	736	741	30	29	P		✓	"	
3	P-143	P-149	NEOS	SEOS	"	730	735	30	29	P		✓	"	
4	P-84	P-149	WEOS	EEOS	"	749	754	30	30	P		✓	"	
5	P-81	P-149	NEOS	SEOS	"	755	800	31	29	P		✓	"	
6														
7	P-60	P 148	WEOS	EEOS	"	723	728	30	29	P		✓	"	
8														
9														
10														
11														
12														
13														
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15														
16														
17														
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ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX Q

Vacuum Testing Logs

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/10/13

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 3

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	3A	BV	N	Y	WP	
2	2X	"	N	Y	"	
3	2W	"	N	Y	"	
4	2V	"	N	Y	"	
5	2T	"	N	Y	"	
6	1N	"	N	Y	"	
7	2S	"	N	Y	"	
8	2R	"	N	Y	"	
9	1H	"	N	Y	"	
10	2Q	"	N	Y	"	
11	1M	"	N	Y	"	
12	2P	"	N	Y	"	
13	2N	"	N	Y	"	
14	10C	"	N	Y	"	
15	2G	"	N	Y	"	
16	1X	"	N	Y	"	
17	1W	"	N	Y	"	
18	1V	"	N	Y	"	
19	1T	"	N	Y	"	
20	1S	"	N	Y	"	
21	1R	"	N	Y	"	
22	4F	"	N	Y	"	
23	4H	"	N	Y	"	
24	4I	"	N	Y	"	
25	4J	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	4K	BV	N	Y	WP	
27	4M	"	N	Y	WP	
28	4N	"	N	Y	WP	
29	4P	"	N	Y	WP	
30	4Q	"	N	Y	WP	
31	4R	"	N	Y	"	
32	4S	"	N	Y	"	
33	5A	"	N	Y	"	
34	4T	"	N	Y	"	
35	4V	"	N	Y	"	
36	4W	"	N	Y	"	
37	4X	"	N	Y	"	
38	3E	"	N	Y	"	
39	4D	"	N	Y	"	
40	3F	"	N	Y	"	
41	3G	"	N	Y	"	
42	10D	"	N	Y	"	
43	3H	"	N	Y	"	
44	3I	"	N	Y	"	
45	3J	"	N	Y	"	
46	11J	"	N	Y	"	
47	3K	"	N	Y	"	
48	3M	"	N	Y	"	
49	2J	"	N	Y	"	
50	3N	"	N	Y	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/10/10

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 3

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	3P	BV	N	Y	wp	
2	3Q	"	N	Y	"	
3	3R	"	N	Y	"	
4	3S	"	N	Y	"	
5	3T	"	N	Y	"	
6	3U	"	N	Y	"	
7	3V	"	N	Y	"	
8	3X	"	N	Y	"	
9	6D	"	N	Y	"	
10	6C	"	N	Y	"	
11	6B	"	N	Y	"	
12	6A	"	N	Y	"	
13	5X	"	N	Y	"	
14	5W	"	N	Y	"	
15	5V	"	N	Y	"	
16	5T	"	N	Y	"	
17	5S	"	N	Y	"	
18	5R	"	N	Y	"	
19	5I	"	N	Y	"	
20	5Q	"	N	Y	"	
21	5M	"	N	Y	"	
22	5P	"	N	Y	"	
23	7D	"	N	Y	"	
24	5N	"	N	Y	"	
25	5M	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	5K	BV	N	Y	wp	
27	5J	"	N	Y	"	
28	9E	"	N	Y	"	
29	9F	"	N	Y	"	
30	9G	"	N	Y	"	
31	9H	"	N	Y	"	
32	9I	"	N	Y	"	
33	9J	"	N	Y	"	
34	7S	"	N	Y	"	
35	7P	"	N	Y	"	
36	10F	"	N	Y	"	
37	9M	"	N	Y	"	
38	7T	"	N	Y	"	
39	10G	"	N	Y	"	
40	9N	"	N	Y	"	
41	9P	"	N	Y	"	
42	9S	"	N	Y	"	
43	9Q	"	N	Y	wp	
44	10H	"	N	Y	"	
45	9R	"	N	Y	"	
46	9T	"	N	Y	"	
47	9T	"	N	Y	"	
48	9V	"	N	Y	"	
49	9W	"	N	Y	"	
50	7V	"	N	Y	wp	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/10/10

REVIEWED BY: [illegible]

SHEET NUMBER: 3 of 3

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	9K	BV	N	Y	WP	
2	9X	"	N	Y	"	
3	9S	"	N	Y	"	
4	9R	"	N	Y	"	
5	9Q	"	N	Y	"	
6	9P	"	N	Y	"	
7	9N	"	N	Y	"	
8						
9	8K	"	N	Y	"	
10	8J	"	N	Y	"	
11	8I	"	N	Y	"	
12	8H	"	N	Y	"	
13	8G	"	N	Y	"	
14	8F	"	N	Y	"	
15	8E	"	N	Y	"	
16	8D	"	N	Y	"	
17	8C	"	N	Y	"	
18	10J	"	N	Y	"	
19	11T	"	N	Y	"	
20						
21						
22						
23						
24						
25						

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26						
27						
28						
29						
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31						
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ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/13/10

REVIEWED BY: [illegible]

SHEET NUMBER: 1 of 4

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	15Q	BV	N	Y	WP	
2	15R	"	N	Y	"	
3	14G	"	N	Y	"	
4	15V	"	N	Y	"	
5	15T	"	N	Y	"	
6	15S	"	N	Y	"	
7	15W	"	N	Y	"	
8	16F	"	N	Y	"	
9	16E	"	N	Y	"	
10	16D	"	N	Y	"	
11	16C	"	N	Y	"	
12	16B	"	N	Y	"	
13	16A	"	N	Y	"	
14	16P	"	N	Y	"	
15	16N	"	N	Y	"	
16	16K	"	N	Y	"	
17	10T	"	N	Y	"	
18	11S	"	N	Y	"	
19	14E	"	N	Y	"	
20	15B	"	N	Y	"	
21	15A	"	N	Y	"	
22	10N	"	N	Y	"	
23	16J	"	N	Y	"	
24	16I	"	N	Y	"	
25	13M	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	13N	BV	N	Y	WP	
27	13A	"	N	Y	"	
28	11R	"	N	Y	WP	
29	13J	"	N	Y	"	
30	13I	"	N	Y	"	
31	11T	"	N	Y	"	
32	11X	"	N	Y	"	
33	13H	"	N	Y	"	
34	13G	"	N	Y	"	
35	13F	"	N	Y	"	
36	16M	"	N	Y	"	
37	13E	"	N	Y	"	
38	11V	"	N	Y	"	
39	13D	"	N	Y	"	
40	12X	"	N	Y	"	
41	12W	"	N	Y	"	
42	12V	"	N	Y	"	
43	12T	"	N	Y	"	
44	11W	"	N	Y	"	
45	12S	"	N	Y	"	
46	12C	"	N	Y	"	
47	12R	"	N	Y	"	
48	12J	"	N	Y	"	
49	12M	"	N	Y	"	
50	12N	"	N	Y	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: !001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/13/10

REVIEWED BY: [illegible]

SHEET NUMBER: 2 of 4

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	12I	BV	N	Y	[illegible]	
2	12H	"	N	Y	"	
3	12G	"	N	Y	"	
4	13A	"	N	Y	"	
5	12K	"	N	Y	"	
6	12P	"	N	Y	"	
7	12Q	"	N	Y	"	
8	8M	"	N	Y	"	
9	3A	"	N	Y	"	
10						
11	10W	"	N	Y	"	
12	10X	"	N	Y	"	
13	12F	"	N	Y	"	
14	12A	"	N	Y	"	
15	12B	"	N	Y	"	
16	12C	"	N	Y	"	
17	12D	"	N	Y	"	
18	12E	"	N	Y	"	
19	10S	"	N	Y	"	
20	11Q	"	N	Y	"	
21	10N	"	N	Y	"	
22	11M	"	N	Y	"	
23	11N	"	N	Y	"	
24	10P	"	N	Y	"	
25	10R	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	11P	BV	N	Y	"	
27	10Q	"	N	Y	"	
28	10M	"	N	Y	"	
29	13W	"	N	Y	"	
30	13V	"	N	Y	"	
31	13T	"	N	Y	"	
32	13X	"	N	Y	"	
33	13S	"	N	Y	"	
34	13R	"	N	Y	"	
35	13Q	"	N	Y	"	
36	13P	"	N	Y	"	
37	15D	"	N	Y	"	
38	15M	"	N	Y	"	
39	15N	"	N	Y	"	
40	15E	"	N	Y	"	
41	14I	"	N	Y	"	
42	15F	"	N	Y	"	
43	14A	"	N	Y	"	14A
44	15G	"	N	Y	"	
45	15H	"	N	Y	"	
46	15I	"	N	Y	"	
47	14R	"	N	Y	"	
48	14S	"	N	Y	"	
49	15J	"	N	Y	"	
50	15K	"	N	Y	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: 1001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/13/10

REVIEWED BY:

SHEET NUMBER: 3 of 4

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	14H	BV	N	Y	WP	
2	16H	"	N	Y	"	
3	16G	"	N	Y	"	
4	15P	"	N	Y	"	
5	15L	"	N	Y	"	
6	14K	"	N	Y	"	
7	14J	"	N	Y	"	
8	14D	"	N	Y	"	
9	14F	"	N	Y	"	
10	16W	"	N	Y	"	
11	14C	"	N	Y	"	
12	16Q	"	N	Y	"	
13	14X	"	N	Y	"	
14	14W	"	N	Y	"	
15	6K	"	N	Y	"	
16	6M	"	N	Y	"	6M
17	7B	"	N	Y	"	
18	6N	"	N	Y	"	
19	6P	"	N	Y	"	6P
20	6Q	"	N	Y	"	
21	6R	"	N	Y	"	
22	6S	"	N	Y	"	
23	6T	"	N	Y	"	
24	6V	"	N	Y	"	
25	6W	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	6X	BV	N	Y	WP	
27	7C	"	N	Y	"	
28	7D	"	N	Y	"	
29	7E	"	N	Y	"	
30	7F	"	N	Y	"	
31	7G	"	N	Y	"	
32	7H	"	N	Y	"	
33	11I	"	N	Y	"	
34	6E	"	N	Y	"	
35	6F	"	N	Y	"	
36	6G	"	N	Y	"	
37	6J	"	N	Y	"	
38	6J	"	N	Y	"	
39	6H	"	N	Y	"	
40	11E	"	N	Y	"	
41	11D	"	N	Y	"	
42	11C	"	N	Y	"	
43	11B	"	N	Y	"	
44	14B	"	N	Y	"	
45	16S	"	N	Y	"	
46	9D	"	N	Y	"	
47	8W	"	N	Y	"	
48	7N	"	N	Y	"	
49	10A	"	N	Y	"	
50	10B	"	N	Y	"	

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/13/10

REVIEWED BY: [illegible]

SHEET NUMBER: 4 of 4

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
1	10I	BV	N	Y	WP	
2	9X	"	N	Y	"	
3	7K	"	N	Y	"	
4	7J	"	N	Y	"	
5	8V	"	N	Y	"	
6	7Q	"	N	Y	"	
7	7M	"	N	Y	"	
8	7W	"	N	Y	"	
9	9C	"	N	Y	"	
10	9B	"	N	Y	"	
11	7X	"	N	Y	"	
12	9A	"	N	Y	"	
13	14Q	"	N	Y	"	
14	16T	"	N	Y	"	
15	16V	"	N	Y	"	
16	7R	"	N	Y	"	
17	5G	"	N	Y	"	
18	5E	"	N	Y	"	
19	5B	"	N	Y	"	
20	5C	"	N	Y	"	
21	4E	"	N	Y	"	
22	4C	"	N	Y	"	
23	4B	"	N	Y	"	
24	1Q	"	N	Y	"	
25	2K	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	1P	BV	N	Y	WP	
27	2I	"	N	Y	"	
28	1K	"	N	Y	"	
29	1J	"	N	Y	"	
30	1G	"	N	Y	"	
31	2D	"	N	Y	"	
32	2F	"	N	Y	"	
33	2E	"	N	Y	"	
34	1I	"	N	Y	"	
35	2H	"	N	Y	"	
36	1F	"	N	Y	"	
37	1E	"	N	Y	"	
38	2B	"	N	Y	"	
39	2A	"	N	Y	"	
40	3B	"	N	Y	"	
41	1C	"	N	Y	"	CAPS 1D
42	1B	"	N	Y	"	
43	1A	"	N	Y	"	
44						
45						
46						
47						
48						
49						
50						

ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE SEAM VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/13/--

REVIEWED BY:

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-113	TI	EEOS	WEOS	BV	N		✓	[illegible]	
2	P-91	TF	WEOS	EEOS	"	N		✓	"	
3	P-90	TI	WEOS	EEOS	"	N		✓	"	
4	P-89	TI	WEOS	EEOS	"	N		✓	"	
5	P-88	TF	WEOS	EEOS	"	N		✓	"	
6	P-87	TF	WEOS	EEOS	"	N		✓	"	
7	P-86	TI	WEOS	12F	"	N	✓		"	
8	P-86	TI	12F	EEOS	"	N		✓	"	
9	P-1	TI	WEOS	EEOS	"	N		✓	"	
10	P-35	TI	WEOS	EEOS	"	N		✓	"	
11	P-34	TI	WEOS	EEOS	"	N		✓	"	
12	P-51	TI	WEOS	EEOS	"	N		✓	"	
13										
14										
15										
16										
17										
18										
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20										
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ATLANTIC COAST CONSULTING, INC

GEOMEMBRANE REPAIR VACUUM TEST LOG

PROJECT NUMBER: I001.154

PROJECT TITLE: CMS Landfill V Cell 2I

PROJECT LOCATION: Charlotte, North Carolina

DATE OF VACUUM TEST: 12/14/2010

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	2C	BV	N	Y	RTH	
2						
3	2J	"	N	Y	"	
4	7I	"	N	Y	"	
5	10V	"	N	Y	"	
6	10E	"	N	Y	"	
7	11A	"	N	Y	"	
8	11F	"	N	Y	"	
9	11G	"	N	Y	"	
10	11H	"	N	Y	"	
11	11K	"	N	Y	"	
12	4D	"	N	Y	"	
13	4A	"	N	Y	"	
14	17A	"	N	Y	"	
15	13B	"	N	Y	"	
16	16X	"	N	Y	"	
17	14P	"	N	Y	"	
18	15X	"	N	Y	"	
19	16R	"	N	Y	"	
20	5D	"	N	Y	"	
21	5F	"	N	Y	"	
22						
23	8A	"	N	Y	"	
24	10I	"	N	Y	"	
25	10J	"	N	Y	"	

LINE NUMBER	DEFECT CODE	QC TECH. INITIALS	OBSERVED DEFECTS	REPAIR COMPLETED YES OR NO	CQA MONITOR INITIALS	REMARKS
26	10K	BV	N	Y	RTH	
27	14M	"	N	Y	"	
28	14Q	"	N	Y	"	
29	14T	"	N	Y	"	
30	14V	"	N	Y	"	
31	3D	"	N	Y	"	
32	2M	"	N	Y	"	
33						
34						
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ATLANTIC COAST CONSULTING, INC

of NORTH CAROLINA, PLLC

APPENDIX R

Destructive Seam Strength Testing

TRI/Environmental, Inc.
A Texas Research International Company

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppl)	143	131	149	145	146	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppl)	139	142	134	139	140	**139**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppl)	186	186	186	187	186	**186**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-2 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppl)	157	151	155	157	153	**155**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppl)	140	136	140	140	134	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppl)	194	192	191	191	192	**192**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-3 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	156	158	154	166	157	**158**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	157	151	146	150	158	**152**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	193	192	192	192	193	**192**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	147	150	154	146	150	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	159	153	163	158	153	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	199	204	205	196	206	**202**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-5 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	149	151	153	150	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	162	157	158	157	164	**160**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	199	202	199	200	206	**201**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	143	136	151	141	140	**142**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	144	155	137	141	155	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	193	207	196	201	194	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	141	159	146	150	164	**152**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	144	145	147	148	141	**145**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	193	192	192	196	200	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	139	147	137	129	139	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	136	151	134	152	136	**142**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	198	196	194	196	190	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-9 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	155	153	155	161	161	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	151	131	129	156	128	**139**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	188	190	187	182	193	**188**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-10 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	149	146	149	154	150	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	154	142	140	154	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	186	187	186	190	196	**189**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-11 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	158	157	161	163	165	**161**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	149	167	137	160	137	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	199	201	197	193	204	**199**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-12 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	175	162	164	161	153	**163**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	147	157	153	148	132	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	195	197	198	203	206	**200**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-13 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	166	146	166	146	166	**158**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	131	160	140	165	134	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	199	194	203	205	196	**199**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-14 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	158	131	160	158	160	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	156	148	131	134	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	204	205	208	211	201	**206**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-15 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	155	155	162	152	157	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	138	135	133	132	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	198	203	207	206	206	**204**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-16 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	158	147	150	159	160	**155**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	136	129	152	134	132	**136**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	194	201	193	198	200	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-17 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	153	162	152	151	151	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	133	133	155	155	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	194	197	193	191	191	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-18 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	153	162	153	144	155	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	141	158	130	144	151	**145**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	198	200	193	192	191	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-19 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	164	162	165	162	156	**162**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	148	164	151	142	161	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	195	204	196	196	199	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-20 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	164	163	159	160	156	**160**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	155	165	161	166	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	200	204	199	197	198	**199**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-21 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	130	148	158	136	160	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	139	148	146	143	153	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	200	203	201	205	206	**203**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-22 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	149	145	143	161	139	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	149	126	131	144	154	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	192	196	193	195	198	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-23 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	161	160	143	155	150	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	142	140	158	138	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	196	197	192	191	189	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-24 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	158	164	146	156	152	**155**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	160	170	147	152	155	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	193	192	190	192	193	**192**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID: DS-25 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	170	165	165	170	156	**165**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	149	146	168	151	154	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	172	174	171	170	169	**171**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-26 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	154	155	155	151	154	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	144	145	159	154	153	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	191	193	194	187	193	**192**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-27 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	152	147	150	155	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	160	152	143	145	154	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	199	198	193	192	192	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-28 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	171	164	168	165	155	**165**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	145	161	161	135	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	200	196	194	190	195	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-29 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	154	138	140	144	159	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	145	144	153	155	**148**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	200	196	194	193	203	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-30 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	146	148	137	154	146	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	147	143	162	152	142	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	196	200	194	193	196	**196**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-31 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	143	141	142	160	142	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	147	153	148	155	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	185	197	190	196	198	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-32 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	157	163	153	154	159	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	146	151	147	140	161	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	189	188	188	194	191	**190**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-33 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	160	149	140	158	140	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	167	142	138	172	131	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	195	195	200	198	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-34 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	130	156	129	152	161	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	139	142	141	159	141	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	194	195	195	199	197	**196**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-35 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	154	153	153	149	**152**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	144	136	145	138	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	205	203	203	207	203	**204**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-36 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	145	143	151	141	146	**145**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	149	143	151	145	148	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	202	196	197	197	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-37 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	155	146	149	158	155	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	149	152	145	162	152	**152**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	193	200	192	195	194	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-38 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	145	156	146	141	155	**149**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	134	169	147	148	161	**152**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	196	196	204	198	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-39 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	151	160	154	159	150	**155**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	166	142	140	145	158	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	200	199	198	203	201	**200**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4980

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID: DS-40 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	141	147	142	155	144	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	158	162	143	138	140	**148**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	190	190	190	196	195	**192**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-41 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	147	156	159	151	153	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	152	157	150	160	160	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	169	171	169	178	183	**174**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4989

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-42 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	149	148	150	141	144	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	129	142	129	135	125	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	188	188	185	192	191	**189**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-43 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	131	130	134	138	128	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	152	157	139	147	140	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	197	194	202	200	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4989

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-44 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	143	137	140	140	**142**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	155	150	147	156	146	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	199	198	198	204	203	**200**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-45 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	154	148	152	160	141	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	153	159	137	135	149	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	191	197	190	192	195	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4989

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-46 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	136	142	137	144	133	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	135	150	135	148	148	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	187	191	186	193	191	**190**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-47 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	146	145	149	147	142	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	141	145	143	141	143	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	193	195	192	196	199	**195**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4989

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-48 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	138	136	139	132	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	111	153	121	114	133	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	186	183	185	181	187	**184**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-49 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	155	155	159	159	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	124	136	127	134	122	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	190	190	186	194	191	**190**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4989

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-50 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	135	145	148	148	138	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	138	146	150	140	139	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	188	190	185	191	189	**189**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-51 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	157	166	161	164	160	**162**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	157	164	151	157	154	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	170	163	169	168	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-52 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	144	151	163	150	140	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	148	157	161	154	158	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	196	196	194	201	198	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-53 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	155	154	144	148	**151**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	135	138	129	144	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	198	206	202	195	**200**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

Pass

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-54 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	152	151	152	150	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	154	136	154	133	136	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	198	196	205	200	**199**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-55 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	133	160	157	141	131	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	142	141	141	139	**139**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	198	202	199	205	198	**201**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-56 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	144	145	138	163	162	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	134	134	139	142	**139**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	201	201	198	206	203	**202**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-57 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	134	144	136	141	149	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	142	139	147	144	140	**142**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	197	196	195	201	199	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-58 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	154	145	158	163	155	**155**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	146	145	138	141	128	**140**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	196	195	193	199	196	**196**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-59 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	128	141	133	133	124	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	128	137	136	135	**136**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	190	194	185	187	189	**189**
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.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-60 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	154	148	156	157	166	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	Pass
Side: B						**Peel B**
Peel Strength (ppi)	158	150	147	143	152	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	195	195	194	200	200	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-61 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	148	153	145	156	139	**148**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	Pass
Side: B						**Peel B**
Peel Strength (ppi)	140	133	134	133	145	**137**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	195	194	194	197	197	**196**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-62 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	149	151	142	153	144	**148**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	153	149	162	158	147	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	192	193	190	195	196	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-63 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	137	134	153	154	153	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	158	143	145	148	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	170	168	176	171	**171**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-64 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	149	151	162	171	155	**158**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	148	151	153	167	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	198	195	197	205	196	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-65 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	136	143	155	149	132	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	136	142	142	137	131	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	196	202	198	198	197	**198**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-66 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	148	164	162	157	147	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	127	127	132	135	133	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	202	200	195	195	195	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-67 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	156	160	149	139	145	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	Pass
Side: B						**Peel B**
Peel Strength (ppi)	143	145	150	153	150	**148**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	195	193	190	196	190	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-68 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	144	164	166	157	166	**159**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	Pass
Side: B						**Peel B**
Peel Strength (ppi)	140	144	133	164	141	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	192	192	192	197	193	**193**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-69 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	145	142	153	137	161	**148**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	162	153	145	148	141	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	186	187	185	191	186	**187**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-70 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	166	157	160	150	160	**159**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	165	131	150	143	148	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	192	193	186	187	183	**188**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

Pass

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TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-71 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	131	143	134	125	136	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	Pass
Side: B						**Peel B**
Peel Strength (ppi)	126	139	136	136	132	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	194	195	194	202	200	**197**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-72 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	133	124	137	136	136	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	Pass
Side: B						**Peel B**
Peel Strength (ppi)	122	118	121	110	113	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	181	181	182	185	186	**183**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Charlotte Motor Speedway

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SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-73 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	162	162	156	158	154	**158**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	132	163	132	162	138	**145**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	200	199	207	203	202	**202**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-74 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	151	155	140	151	154	**150**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	104	105	105	111	101	**105**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	173	176	173	180	179	**176**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-75 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	141	146	145	140	132	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	149	150	156	154	158	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	153	152	158	156	154	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-76 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	153	163	163	155	153	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	153	154	153	152	160	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	158	158	165	160	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-77 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	149	150	144	136	139	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	140	143	131	156	144	**143**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	190	192	191	199	198	**194**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-78 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	138	147	146	135	138	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	149	131	131	127	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	172	179	172	172	176	**174**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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http://www.geosyntheticstesting.com
9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4976

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-1 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	163	137	142	144	131	**143**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	155	157	160	154	**156**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

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TRI/Environmental, Inc.
A Texas Research International Company

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: Republic Services, Inc.
Project: Charlotte Motor Speedway

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4980

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-2 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	139	143	148	162	120	**142**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	161	163	161	157	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

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TRI/Environmental, Inc.
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4989

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-3 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	124	119	140	150	122	**131**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	147	147	155	146	146	**148**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-4 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	152	165	141	134	131	**145**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	167	172	160	161	159	**164**
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 - SINGLE TRACK
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 4999

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-5 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	148	149	142	130	122	**138**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	161	164	172	167	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-6 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	134	145	132	136	124	**134**
Peel Incursion (%)	30%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	AD-BRK	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	170	169	178	174	**172**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-7 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	128	116	135	112	130	**124**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	164	161	166	166	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-8 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	149	149	147	172	157	**155**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	Pass
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	171	170	169	171	175	**171**
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 - SINGLE TRACK
TRI Client: Atlantic Coast Consulting, Inc.
Project: Charlotte Motor Speedway

Material: 60 HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 5006

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-9 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	167	158	161	147	163	**159**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	158	157	161	168	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Pass

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of NORTH CAROLINA, PLLC

APPENDIX S

Protective Cover Laboratory Test Results

TIMELY ENGINEERING SOIL TESTS, LLC
374 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 (PS-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer 3/4" Sieve	% Finer #200 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
10127	PS-1	-	-	100.0	17.9	-	-	-	-	10.4	112.3*	10.4	101.3	3.9E-04
10127 A	PS-1	-	-	-	-	-	-	-	-	-	-	10.4	89.9	4.6E-04
10128	PS-2	-	-	100.0	67.4	-	-	-	-	23.8	84.4*	23.8	75.7	1.2E-04
10128 A	PS-2	-	-	-	-	-	-	-	-	-	-	23.8	67.5	2.6E-04
10170	PS-3	-	-	100.0	61.4	-	-	-	-	2.2	101.0*	2.2	80.9	3.2E-04
10171	PS-4	-	-	100.0	22.3	-	-	-	-	7.2	107.2*	7.2	85.8	7.1E-04
10420	PS-5	-	-	100.0	81.5	-	-	-	-	29.4	87.8*	29.4	74.6	5.0E-04
10438	PS-6	-	-	100.0	38.2	-	-	-	-	29.9	81.5*	29.9	69.2	7.3E-04
10439	PS-7	-	-	100.0	72.1	-	-	-	-	35.1	80.7*	35.1	68.6	2.9E-04
10882	PS-8	-	-	100.0	92.1	-	-	-	-	40.4	78.9*	40.4	66.8	3.1E-04
10883	PS-9	-	-	100.0	86.0	-	-	-	-	39.7	79.7*	39.7	67.6	3.3E-04
10884	PS-10	-	-	100.0	90.1	-	-	-	-	41.0	78.2*	41.0	66.5	2.7E-04
10885	PS-11	-	-	100.0	95.2	-	-	-	-	36.8	81.5*	36.8	69.2	5.1E-04
10886	PS-12	-	-	100.0	77.5	-	-	-	-	35.4	84.1*	35.4	71.6	4.6E-04
10887	PS-13	-	-	100.0	91.9	-	-	-	-	46.8	74.1*	46.8	63.1	4.6E-04
10888	PS-14	-	-	100.0	93.1	-	-	-	-	38.1	80.9*	38.1	68.7	3.4E-04
10889	PS-15	-	-	100.0	81.2	-	-	-	-	37.9	81.5*	37.9	69.3	3.7E-04
10890	PS-16	-	-	100.0	93.8	-	-	-	-	39.2	80.1*	39.2	68.1	3.2E-04
10891	PS-17	-	-	100.0	80.6	-	-	-	-	35.2	85.0*	35.2	72.5	4.3E-04
10892	PS-18	-	-	100.0	96.7	-	-	-	-	53.0	68.7*	53.0	58.3	4.5E-04
10893	PS-19	-	-	100.0	88.0	-	-	-	-	38.5	80.8*	38.5	68.7	3.8E-04
10894	PS-20	-	-	100.0	97.8	-	-	-	-	51.4	70.3*	51.4	59.8	4.0E-04

Note *=Dry density of one point standard proctor at as-received moisture content

TIMELY ENGINEERING SOIL TESTS, LLC	1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 Fax: 770-923-8973 Web: www.test-llc.com	AAP AASHTO P18	Tested By: RI Date: Checked By:

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10127/PS-1	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	476.00
Mass of Dry Sample & Tare, g	438.50
Mass of Tare, g	76.50
Moisture Content, %	10.36

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	453.40
Mass of Dry Sample & Tare, g	421.70
Mass of Tare, g	98.70
Moisture Content, %	9.81

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	210.18
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	191.40

REMARKS

100% of sample (24600 g) is passing 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	157.08
Percent of sample retained on No. 200 sieve, %	82.07
Percent of material finer than No. 200 sieve, %	**17.93**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AASHTO R18

Tested By	RI
Date	09/20/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10127/PS-1	Depth/Elev.	-
Location	-	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	5050.0	4610.5
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	79.0	79.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

Material Retained on No. 4 Sieve, %	
Material Retained on 3/8" Sieve, %	1.7
Material Retained on 3/4" Sieve, %	
Total, % (oversized)	1.7

MOISTURE CONTENT

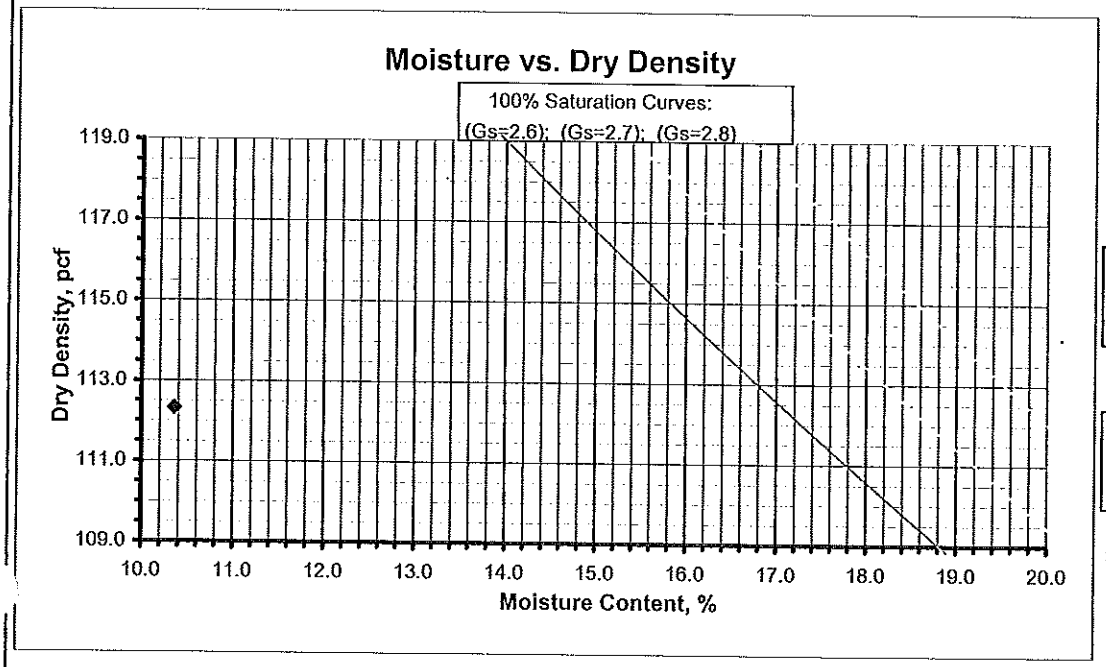
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	905.0	79.0
Mass of Dry Sample & Tare, g	840.3	79.0
Mass of Tare, g	161.5	0.0
Moisture Content, %	9.5	0.0

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	6123.0				
Mass of Wet Sample & Tare, g	476.0				
Mass of Dry Sample & Tare, g	438.5				
Mass of Tare, g	76.5				
Moisture Content, %	10.4				
Wet Density, pcf	124.0				
Dry Density, pcf	112.3				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO R18

Tested By	RI
Date	09/21/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10127/PS-1	Depth/Elev.	-
Location	-	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	2.565	in	6.52	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.14	cm^3	0.0095	ft^3
Mass	480.30	g	1.06	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	101.3	pcf		

Moisture Content

Mass of wet sample & tare	359.90	g
Mass of dry sample & tare	333.60	g
Mass of tare	79.70	g
% Moisture	10.4	

Test Data

Speed	2	
Board Number	3	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	19.70	cm
Min Head	19.70	cm
Maximum Gradient	3.04	
Minimum Gradient	3.04	

Final Data (After Test)

Average Height of Sample			2.550	in	6.48	cm
Average Diameter of Sample			2.855	in	7.25	cm
Area	6.40	in^2	41.30	cm^2		
Volume	267.51	cm^3	0.0094	ft^3		
Mass	537.20	g	1.18	lb		

Dry Density	101.6	pcf
Vol. of Voids	106.24	cm^3
Vol. of Solids	161.28	cm^3
Void Ratio	0.66	
Saturation	95.8	%

Moisture Content

Mass of wet sample & tare	626.30	g
Mass of dry sample & tare	524.60	g
Mass of tare	89.40	g
% Moisture	23.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
09/21/10	8	0	-	0.28	19.70	3.04	27.0	-	-	-	
09/21/10	8	1	60	0.28	19.70	3.04	27.0	4.57E-04	0.850	3.88E-04	
09/21/10	8	2	60	0.28	19.70	3.04	27.0	4.57E-04	0.850	3.88E-04	
09/21/10	8	3	60	0.28	19.70	3.04	27.0	4.57E-04	0.850	3.88E-04	*
09/21/10	8	4	60	0.28	19.70	3.04	27.0	4.57E-04	0.850	3.88E-04	*
09/21/10	8	5	60	0.28	19.70	3.04	27.0	4.57E-04	0.850	3.88E-04	*
09/21/10	8	6	60	0.28	19.70	3.04	27.0	4.57E-04	0.850	3.88E-04	*

Reported Average Hydraulic Conductivity* 3.9E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 101.3 pcf of dry density (90.2% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO R18

Tested By	RI
Date	09/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10127A/PS-1	Depth/Elev.	-
Location	-	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	427.00	g	0.94	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	89.9	pcf		

Moisture Content

Mass of wet sample & tare	427.00	g
Mass of dry sample & tare	386.90	g
Mass of tare	0.00	g
% Moisture	10.4	

Test Data

Speed	2	
Board Number	6	
Cell Number	10	
Flow Pump Number	2A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	17.59	cm
Min Head	17.59	cm
Maximum Gradient	2.79	
Minimum Gradient	2.79	

Final Data (After Test)

Average Height of Sample			2.485	in	6.31	cm
Average Diameter of Sample			2.740	in	6.96	cm
Area	5.90	in^2	38.04	cm^2		
Volume	240.11	cm^3	0.0085	ft^3		
Mass	479.00	g	1.06	lb		

Dry Density	100.5	pcf
Vol. of Voids	96.85	cm^3
Vol. of Solids	143.27	cm^3
Void Ratio	0.68	
Saturation	95.2	%

Moisture Content

Mass of wet sample & tare	572.00	g
Mass of dry sample & tare	479.80	g
Mass of tare	92.90	g
% Moisture	23.8	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
09/23/10	9	10	-	0.25	17.59	2.79	27.1	-	-	-	
09/23/10	9	11	60	0.25	17.59	2.79	27.1	5.41E-04	0.848	4.59E-04	
09/23/10	9	12	60	0.25	17.59	2.79	27.1	5.41E-04	0.848	4.59E-04	
09/23/10	9	13	60	0.25	17.59	2.79	27.1	5.41E-04	0.848	4.59E-04	*
09/23/10	9	14	60	0.25	17.59	2.79	27.1	5.41E-04	0.848	4.59E-04	*
09/23/10	9	15	60	0.25	17.59	2.79	27.1	5.41E-04	0.848	4.59E-04	*
09/23/10	9	16	60	0.25	17.59	2.79	27.1	5.41E-04	0.848	4.59E-04	*

Reported Average Hydraulic Conductivity* 4.6E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 89.9 pcf of dry density (80.1% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	244	Balance ID #	1/6/7	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

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AASHTO P18

Tested By	RI
Date	
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10128/PS-2	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	417.00
Mass of Dry Sample & Tare, g	352.00
Mass of Tare, g	79.00
Moisture Content, %	23.81

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	345.60
Mass of Dry Sample & Tare, g	297.80
Mass of Tare, g	99.90
Moisture Content, %	24.15

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	201.07
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	161.95

REMARKS

100% of sample (18500 g) is passing 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	52.87
Percent of sample retained on No. 200 sieve, %	32.65
Percent of material finer than No. 200 sieve, %	**67.35**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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Tested By	RI
Date	09/20/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10128/PS-2	Depth/Elev.	-
Location	-	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	18500.0	14903.3
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

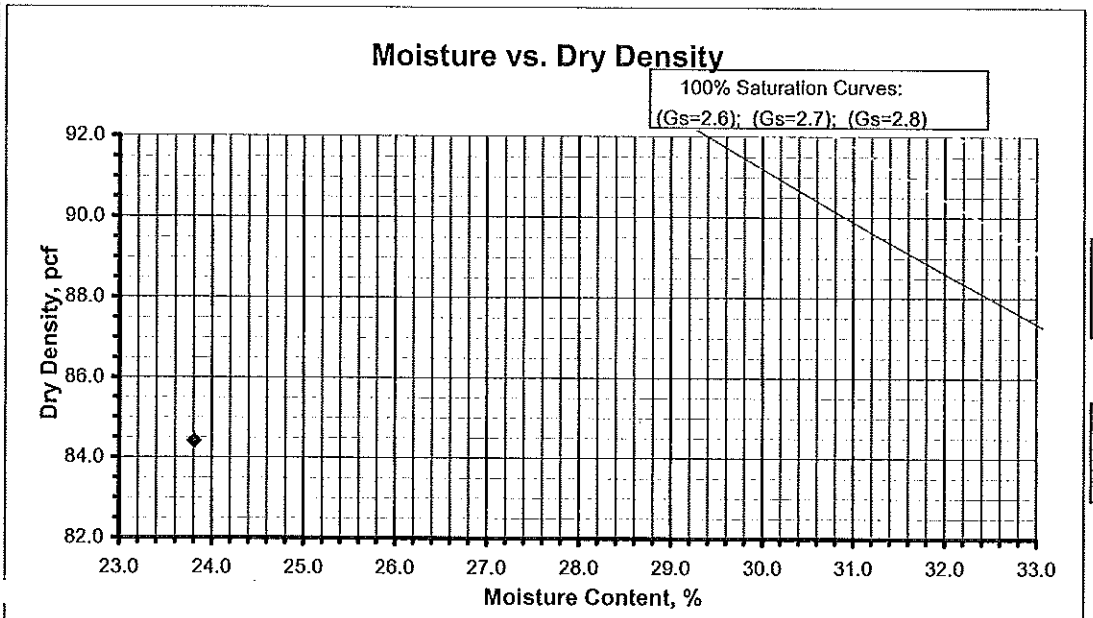
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	856.0	
Mass of Dry Sample & Tare, g	720.2	
Mass of Tare, g	157.5	
Moisture Content, %	24.1	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5829.0				
Mass of Wet Sample & Tare, g	417.0				
Mass of Dry Sample & Tare, g	352.0				
Mass of Tare, g	79.0				
Moisture Content, %	23.8				
Wet Density, pcf	104.5				
Dry Density, pcf	84.4				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AASHTO R18

Tested By	RI
Date	09/21/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10128/PS-2	Depth/Elev.	-
Location	-	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	2.580	in	6.55	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.71	cm^3	0.0095	ft^3
Mass	405.30	g	0.89	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	75.7	pcf		

Moisture Content

Mass of wet sample & tare	346.10	g
Mass of dry sample & tare	294.80	g
Mass of tare	79.60	g
% Moisture	23.8	

Test Data

Speed	2	
Board Number	4	
Cell Number	7	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	61.90	cm
Min Head	61.90	cm
Maximum Gradient	9.25	
Minimum Gradient	9.25	

Final Data (After Test)

Average Height of Sample			2.634	in	6.69	cm
Average Diameter of Sample			2.896	in	7.36	cm
Area	6.59	in^2	42.50	cm^2		
Volume	284.32	cm^3	0.0100	ft^3		
Mass	483.90	g	1.07	lb		

Dry Density	71.8	pcf
Vol. of Voids	163.10	cm^3
Vol. of Solids	121.22	cm^3
Void Ratio	1.35	
Saturation	96.0	%

Moisture Content

Mass of wet sample & tare	584.30	g
Mass of dry sample & tare	427.70	g
Mass of tare	100.40	g
% Moisture	47.8	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
09/21/10	8	0	-	0.88	61.90	9.25	27.0	-	-	-	
09/21/10	8	1	60	0.88	61.90	9.25	27.0	1.46E-04	0.850	1.24E-04	
09/21/10	8	2	60	0.88	61.90	9.25	27.0	1.46E-04	0.850	1.24E-04	
09/21/10	8	3	60	0.88	61.90	9.25	27.0	1.46E-04	0.850	1.24E-04	*
09/21/10	8	4	60	0.88	61.90	9.25	27.0	1.46E-04	0.850	1.24E-04	*
09/21/10	8	5	60	0.88	61.90	9.25	27.0	1.46E-04	0.850	1.24E-04	*
09/21/10	8	6	60	0.88	61.90	9.25	27.0	1.46E-04	0.850	1.24E-04	*

Reported Average Hydraulic Conductivity* 1.2E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 75.7 pcf of dry density (89.8% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	RI
Date	09/23/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10128A/PS-2	Depth/Elev.	-
Location	-	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	360.00	g	0.79	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	67.5	pcf		

Moisture Content

Mass of wet sample & tare	360.00	g
Mass of dry sample & tare	290.70	g
Mass of tare	0.00	g
% Moisture	23.8	

Test Data

Speed	2	
Board Number	5	
Cell Number	17	
Flow Pump Number	2B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	30.25	cm
Min Head	30.25	cm
Maximum Gradient	4.65	
Minimum Gradient	4.65	

Final Data (After Test)

Average Height of Sample			2.561	in	6.50	cm
Average Diameter of Sample			2.840	in	7.21	cm
Area	6.33	in^2	40.87	cm^2		
Volume	265.85	cm^3	0.0094	ft^3		
Mass	441.50	g	0.97	lb		

Dry Density	68.3	pcf
Vol. of Voids	158.11	cm^3
Vol. of Solids	107.74	cm^3
Void Ratio	1.47	
Saturation	95.3	%

Moisture Content

Mass of wet sample & tare	541.10	g
Mass of dry sample & tare	390.60	g
Mass of tare	99.90	g
% Moisture	51.8	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
09/23/10	9	10	-	0.43	30.25	4.65	27.1	-	-	-	
09/23/10	9	11	60	0.43	30.25	4.65	27.1	3.02E-04	0.848	2.56E-04	
09/23/10	9	12	60	0.43	30.25	4.65	27.1	3.02E-04	0.848	2.56E-04	
09/23/10	9	13	60	0.43	30.25	4.65	27.1	3.02E-04	0.848	2.56E-04	*
09/23/10	9	14	60	0.43	30.25	4.65	27.1	3.02E-04	0.848	2.56E-04	*
09/23/10	9	15	60	0.43	30.25	4.65	27.1	3.02E-04	0.848	2.56E-04	*
09/23/10	9	16	60	0.43	30.25	4.65	27.1	3.02E-04	0.848	2.56E-04	*

Reported Average Hydraulic Conductivity* 2.6E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 67.5 pcf of dry density (80.0% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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AASHTO P18

Tested By	RI
Date	0 0
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10170/PS-3	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	526.00
Mass of Dry Sample & Tare, g	516.90
Mass of Tare, g	102.00
Moisture Content, %	2.19

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	526.00
Mass of Dry Sample & Tare, g	516.90
Mass of Tare, g	102.00
Moisture Content, %	2.19

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	197.63
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	193.39

REMARKS

100% of material (5200 gr) is passing 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	74.61
Percent of sample retained on No. 200 sieve, %	38.58
Percent of material finer than No. 200 sieve, %	**61.42**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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Tested By	RI
Date	09/24/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10170/PS-3	Depth/Elev.	-
Location	-	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	10000.0	9775.3
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

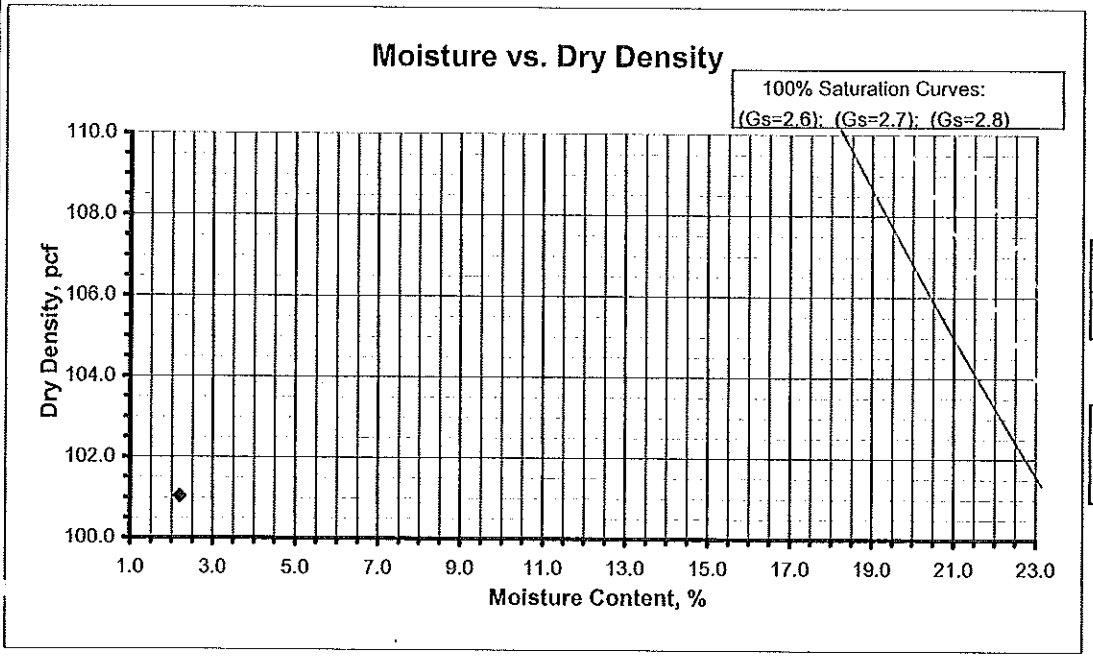
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	791.5	
Mass of Dry Sample & Tare, g	777.2	
Mass of Tare, g	155.0	
Moisture Content, %	2.3	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5810.0				
Mass of Wet Sample & Tare, g	526.0				
Mass of Dry Sample & Tare, g	516.9				
Mass of Tare, g	102.0				
Moisture Content, %	2.2				
Wet Density, pcf	103.2				
Dry Density, pcf	101.0				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	RI
Date	09/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10170/PS-3	Depth/Elev.	-
Location	-	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	356.00	g	0.78	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	80.9	pcf		

Moisture Content

Mass of wet sample & tare	526.00	g
Mass of dry sample & tare	516.90	g
Mass of tare	102.00	g
% Moisture	2.2	

Test Data

Speed	2	
Board Number	4	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	26.03	cm
Min Head	26.03	cm
Maximum Gradient	4.13	
Minimum Gradient	4.13	

Final Data (After Test)

Average Height of Sample			2.480	in	6.30	cm
Average Diameter of Sample			2.695	in	6.85	cm
Area	5.70	in^2	36.80	cm^2		
Volume	231.82	cm^3	0.0082	ft^3		
Mass	443.60	g	0.98	lb		

Dry Density	93.6	pcf
Vol. of Voids	100.54	cm^3
Vol. of Solids	131.28	cm^3
Void Ratio	0.77	
Saturation	95.2	%

Moisture Content

Mass of wet sample & tare	532.90	g
Mass of dry sample & tare	437.20	g
Mass of tare	89.30	g
% Moisture	27.5	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
09/24/10	18	1	-	0.37	26.03	4.13	27.2	-	-	-	
09/24/10	18	2	60	0.37	26.03	4.13	27.2	3.77E-04	0.846	3.19E-04	
09/24/10	18	3	60	0.37	26.03	4.13	27.2	3.77E-04	0.846	3.19E-04	
09/24/10	18	4	60	0.37	26.03	4.13	27.2	3.77E-04	0.846	3.19E-04	*
09/24/10	18	5	60	0.37	26.03	4.13	27.2	3.77E-04	0.846	3.19E-04	*
09/24/10	18	6	60	0.37	26.03	4.13	27.2	3.77E-04	0.846	3.19E-04	*
09/24/10	18	7	60	0.37	26.03	4.13	27.2	3.77E-04	0.846	3.19E-04	*

Reported Average Hydraulic Conductivity* 3.2E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 80.9 pcf of dry density (80.1% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AASHTO P18

Tested By	RI
Date	09/24/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10171/PS-4	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	538.00
Mass of Dry Sample & Tare, g	507.90
Mass of Tare, g	90.50
Moisture Content, %	7.21

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	538.00
Mass of Dry Sample & Tare, g	507.90
Mass of Tare, g	90.50
Moisture Content, %	7.21

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	202.22
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	188.62

REMARKS

100% of material (5200 gr) is passing 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	146.57
Percent of sample retained on No. 200 sieve, %	77.71
Percent of material finer than No. 200 sieve, %	**22.29**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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AASHTO R18

Tested By	RI
Date	09/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10171/PS-4	Depth/Elev.	-
Location	-	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	8000.0	7464.4
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

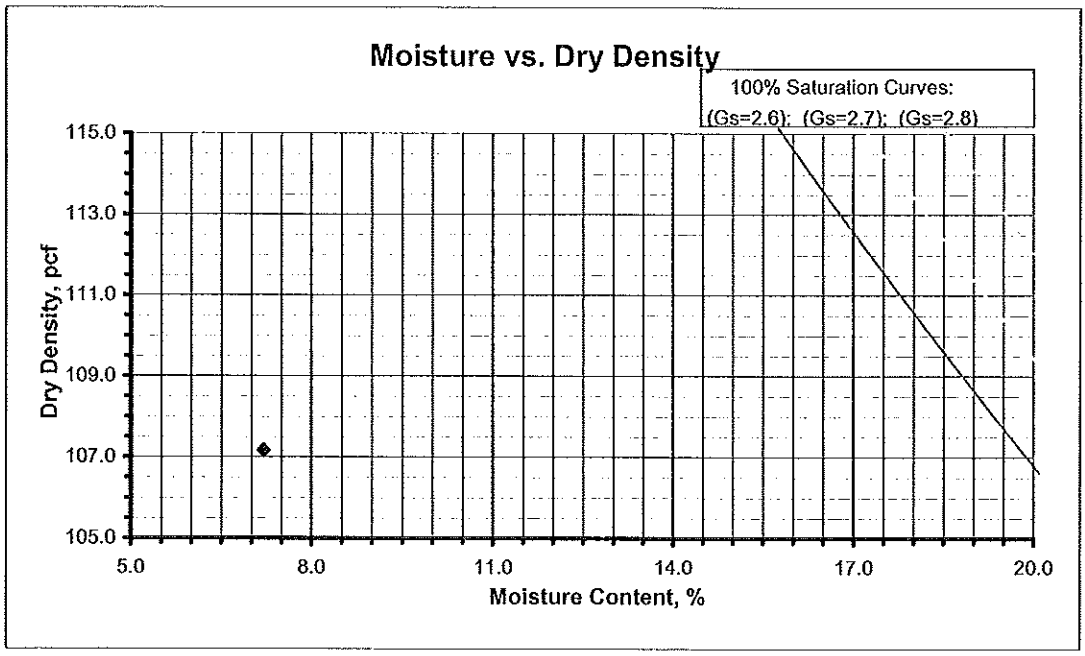
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	751.5	
Mass of Dry Sample & Tare, g	712.0	
Mass of Tare, g	161.5	
Moisture Content, %	7.2	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5986.0				
Mass of Wet Sample & Tare, g	538.0				
Mass of Dry Sample & Tare, g	507.9				
Mass of Tare, g	90.5				
Moisture Content, %	7.2				
Wet Density, pcf	114.9				
Dry Density, pcf	107.2				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.(
Hammer ID Number	318
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% an material retained on 3/4" < 30%

REMARKS

DESCRIPTION

NA

USCS (ASTM D2487; D2488)

NA

Maximum Dry Density, pcf		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	RI
Date	09/24/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-2
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10171/PS-4	Depth/Elev.	-
Location	-	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	396.00	g	0.87	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	85.8	pcf		

Moisture Content

Mass of wet sample & tare	538.00	g
Mass of dry sample & tare	507.90	g
Mass of tare	90.50	g
% Moisture	7.2	

Test Data

Speed	2	
Board Number	3	
Cell Number	17	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	11.25	cm
Min Head	11.25	cm
Maximum Gradient	1.77	
Minimum Gradient	1.77	

Final Data (After Test)

Average Height of Sample			2.510	in	6.38	cm
Average Diameter of Sample			2.760	in	7.01	cm
Area	5.98	in^2	38.60	cm^2		
Volume	246.08	cm^3	0.0087	ft^3		
Mass	473.50	g	1.04	lb		

Dry Density	93.7	pcf
Vol. of Voids	106.59	cm^3
Vol. of Solids	139.49	cm^3
Void Ratio	0.76	
Saturation	97.4	%

Moisture Content

Mass of wet sample & tare	567.80	g
Mass of dry sample & tare	464.00	g
Mass of tare	94.50	g
% Moisture	28.1	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
09/24/10	18	1	-	0.16	11.25	1.77	27.2	-	-	-	
09/24/10	18	2	60	0.16	11.25	1.77	27.2	8.42E-04	0.846	7.12E-04	
09/24/10	18	3	60	0.16	11.25	1.77	27.2	8.42E-04	0.846	7.12E-04	
09/24/10	18	4	60	0.16	11.25	1.77	27.2	8.42E-04	0.846	7.12E-04	*
09/24/10	18	5	60	0.16	11.25	1.77	27.2	8.42E-04	0.846	7.12E-04	*
09/24/10	18	6	60	0.16	11.25	1.77	27.2	8.42E-04	0.846	7.12E-04	*
09/24/10	18	7	60	0.16	11.25	1.77	27.2	8.42E-04	0.846	7.12E-04	*

Reported Average Hydraulic Conductivity* 7.1E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487:2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 85.8 pcf of dry density (80.1% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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AASHTO P18

Tested By	RI
Date	1[illegible]
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS	S. Type	Bulk
Sample ID	10420/PS-5	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	360.00
Mass of Dry Sample & Tare, g	295.20
Mass of Tare, g	75.70
Moisture Content, %	29.52

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	360.00
Mass of Dry Sample & Tare, g	295.20
Mass of Tare, g	75.70
Moisture Content, %	29.52

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	201.87
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	155.86

REMARKS

100% of total material (20200g) passed 3/4" siev

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	28.9
Percent of sample retained on No. 200 sieve, %	18.54
Percent of material finer than No. 200 sieve, %	**81.46**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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Tested By	RI
Date	11/02/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS	S. Type	Bulk
Sample ID	10420/PS-5	Depth/Elev.	-
Location	-	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	20100.0	15518.6
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

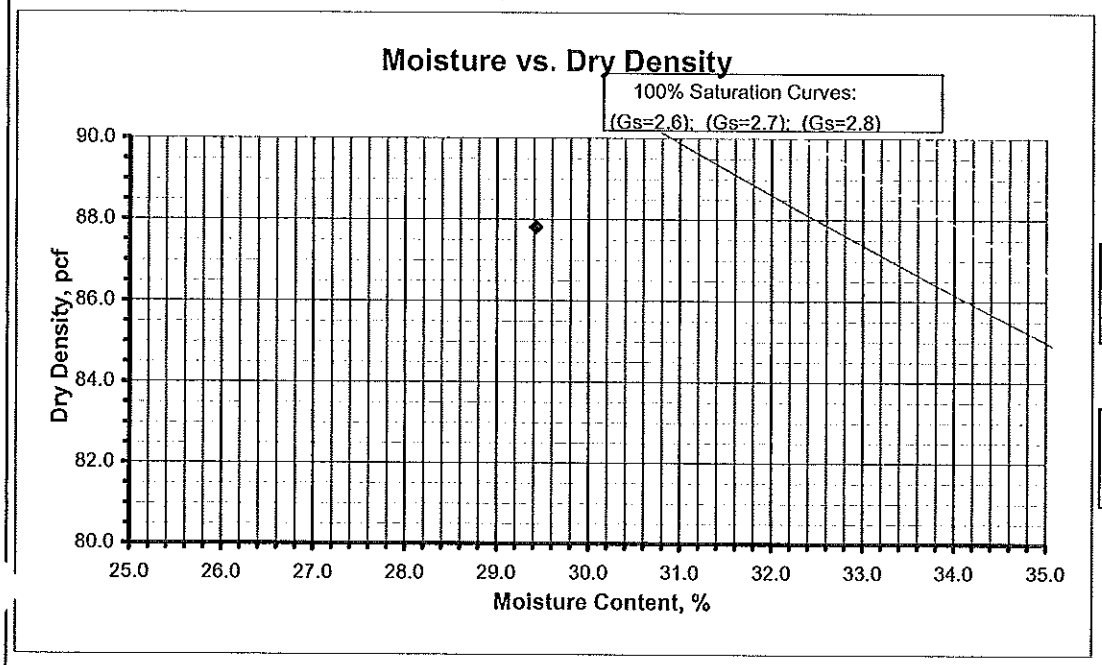
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	360.0	
Mass of Dry Sample & Tare, g	295.2	
Mass of Tare, g	75.7	
Moisture Content, %	29.5	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5967.0				
Mass of Wet Sample & Tare, g	536.5				
Mass of Dry Sample & Tare, g	437.6				
Mass of Tare, g	101.5				
Moisture Content, %	29.4				
Wet Density, pcf	113.6				
Dry Density, pcf	87.8				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	LB
Date	11/04/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS	S. Type	Bulk
Sample ID	10420/PS-5	Depth/Elev.	-
Location	-	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	415.60	g	0.92	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	74.6	pcf		

Moisture Content

Mass of wet sample & tare	536.50	g
Mass of dry sample & tare	437.60	g
Mass of tare	101.50	g
% Moisture	29.4	

Test Data

Speed	2	
Board Number	3	
Cell Number	6	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	17.59	cm
Min Head	17.59	cm
Maximum Gradient	2.71	
Minimum Gradient	2.71	

Final Data (After Test)

Average Height of Sample			2.556	in	6.49 cm
Average Diameter of Sample			2.857	in	7.26 cm
Area	6.41	in^2	41.36	cm^2	
Volume	268.52	cm^3	0.0095	ft^3	
Mass	472.90	g	1.04	lb	

Dry Density	74.8	pcf
Vol. of Voids	149.38	cm^3
Vol. of Solids	119.14	cm^3
Void Ratio	1.25	
Saturation	101.2	%

Moisture Content

Mass of wet sample & tare	543.80	g
Mass of dry sample & tare	392.80	g
Mass of tare	71.60	g
% Moisture	47.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/04/10	8	5	-	0.25	17.59	2.71	21.1	-	-	-	
11/04/10	8	6	60	0.25	17.59	2.71	21.1	5.12E-04	0.974	4.99E-04	
11/04/10	8	7	60	0.25	17.59	2.71	21.1	5.12E-04	0.974	4.99E-04	
11/04/10	8	8	60	0.25	17.59	2.71	21.1	5.12E-04	0.974	4.99E-04	*
11/04/10	8	9	60	0.25	17.59	2.71	21.1	5.12E-04	0.974	4.99E-04	*
11/04/10	8	10	60	0.25	17.59	2.71	21.1	5.12E-04	0.974	4.99E-04	*
11/04/10	8	11	60	0.25	17.59	2.71	21.1	5.12E-04	0.974	4.99E-04	*

Reported Average Hydraulic Conductivity* 5.0E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 85% of dry density (one point standard proctor) at as-received moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AASHTO P18

Tested By	RI
Date	11/03/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10438/PS-6	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	441.30
Mass of Dry Sample & Tare, g	370.60
Mass of Tare, g	140.40
Moisture Content, %	30.71

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	206.39
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	157.90

REMARKS

100% of total material (20100g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	97.6
Percent of sample retained on No. 200 sieve, %	61.81
Percent of material finer than No. 200 sieve, %	**38.19**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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Tested By	RI
Date	11/03/1(
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10438/PS-6	Depth/Elev.	-
Location	-	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	20100.0	15470.4
Mass of Mat. Retained on No. 4 sieve, g	0.0	0.0
Mass of Mat. Retained on 3/8" sieve, g	0.0	0.0
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, %	0.0
Material Retained on 3/4" Sieve, %	0.0
Total, % (oversized)	0.0

MOISTURE CONTENT

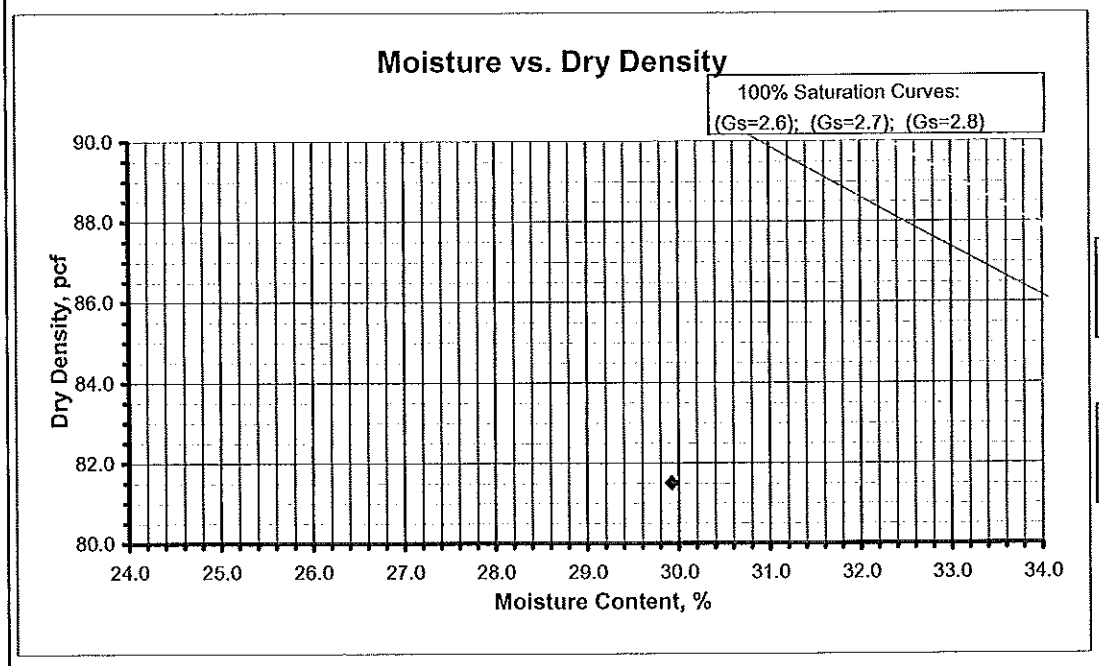
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	563.0	
Mass of Dry Sample & Tare, g	462.0	
Mass of Tare, g	124.5	
Moisture Content, %	29.9	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5850.0				
Mass of Wet Sample & Tare, g	563.0				
Mass of Dry Sample & Tare, g	462.0				
Mass of Tare, g	124.5				
Moisture Content, %	29.9				
Wet Density, pcf	105.9				
Dry Density, pcf	81.5				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.(
Hammer ID Number	31o
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% an material retained on 3/4" < 30%

REMARKS

DESCRIPTION

NA

USCS (ASTM D2487; D2488)

NA

Maximum Dry Density, pcf		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	LB
Date	11/04/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10438/PS-6	Depth/Elev.	-
Location	-	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	387.20	g	0.85	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	69.2	pcf		

Moisture Content

Mass of wet sample & tare	563.00	g
Mass of dry sample & tare	462.00	g
Mass of tare	124.50	g
% Moisture	29.9	

Test Data

Speed	2	
Board Number	4	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
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	1.84	
Minimum Gradient	1.84	

Final Data (After Test)

Average Height of Sample			2.560	in	6.50	cm
Average Diameter of Sample			2.860	in	7.26	cm
Area	6.42	in^2	41.45	cm^2		
Volume	269.50	cm^3	0.0095	ft^3		
Mass	453.70	g	1.00	lb		

Dry Density	69.0	pcf
Vol. of Voids	159.07	cm^3
Vol. of Solids	110.43	cm^3
Void Ratio	1.44	
Saturation	97.8	%

Moisture Content

Mass of wet sample & tare	608.40	g
Mass of dry sample & tare	452.90	g
Mass of tare	154.80	g
% Moisture	52.2	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/04/10	8	5	-	0.17	11.96	1.84	21.1	-	-	-	
11/04/10	8	6	60	0.17	11.96	1.84	21.1	7.52E-04	0.974	7.33E-04	
11/04/10	8	7	60	0.17	11.96	1.84	21.1	7.52E-04	0.974	7.33E-04	
11/04/10	8	8	60	0.17	11.96	1.84	21.1	7.52E-04	0.974	7.33E-04	*
11/04/10	8	9	60	0.17	11.96	1.84	21.1	7.52E-04	0.974	7.33E-04	*
11/04/10	8	10	60	0.17	11.96	1.84	21.1	7.52E-04	0.974	7.33E-04	*
11/04/10	8	11	60	0.17	11.96	1.84	21.1	7.52E-04	0.974	7.33E-04	*

Reported Average Hydraulic Conductivity* 7.3E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 85% of dry density (one point standard proctor) at as-received moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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AASHTO P18

Tested By	RI
Date	
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10439/PS-7	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	443.20
Mass of Dry Sample & Tare, g	356.70
Mass of Tare, g	117.30
Moisture Content, %	36.13

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	203.57
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	149.54

REMARKS

100% of total material (19100g) passed 3/4" sie

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	41.7
Percent of sample retained on No. 200 sieve, %	27.89
Percent of material finer than No. 200 sieve, %	**72.11**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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AASHTO R18

Tested By	RI
Date	11/03/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10439/PS-7	Depth/Elev.	-
Location	-	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	19100.0	14136.3
Mass of Mat. Retained on No. 4 sieve, g	0.0	0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

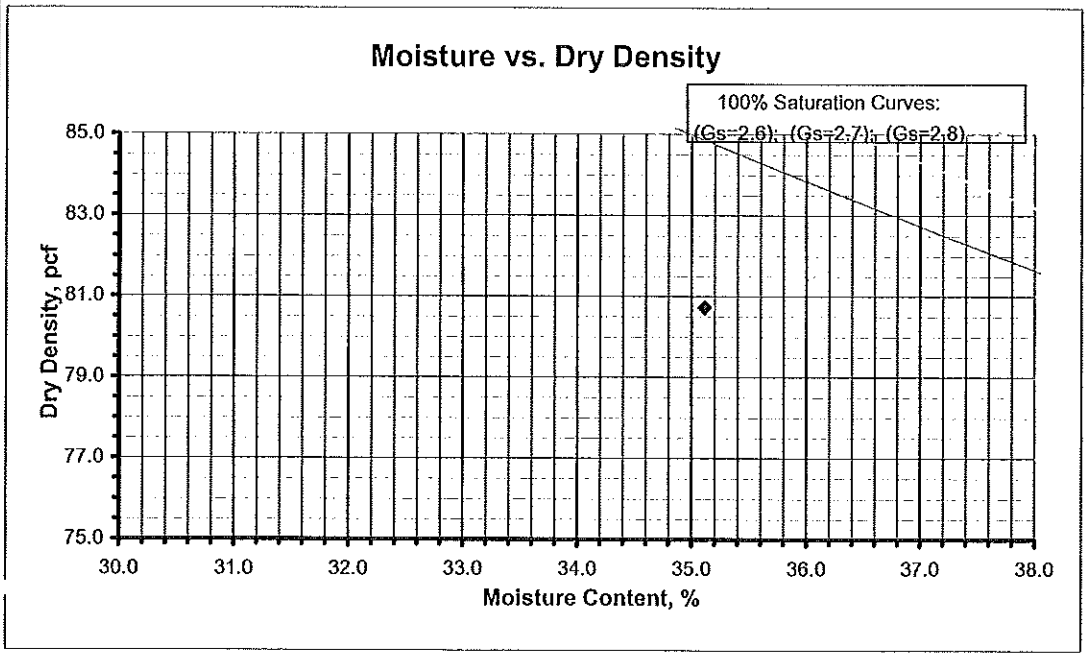
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	543.5	
Mass of Dry Sample & Tare, g	435.0	
Mass of Tare, g	126.0	
Moisture Content, %	35.1	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5898.0				
Mass of Wet Sample & Tare, g	543.5				
Mass of Dry Sample & Tare, g	435.0				
Mass of Tare, g	126.0				
Moisture Content, %	35.1				
Wet Density, pcf	109.1				
Dry Density, pcf	80.7				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	LB
Date	11/04/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-3
Pr. Name	CMS Landfill Cell 2 I	S. Type	Bulk
Sample ID	10439/PS-7	Depth/Elev.	-
Location	-	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	399.00	g	0.88	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	68.6	pcf		

Moisture Content

Mass of wet sample & tare	543.50	g
Mass of dry sample & tare	435.00	g
Mass of tare	126.00	g
% Moisture	35.1	

Test Data

Speed	2	
Board Number	11	
Cell Number	10	
Flow Pump Number	2B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	30.25	cm
Min Head	30.25	cm
Maximum Gradient	4.65	
Minimum Gradient	4.65	

Final Data (After Test)

Average Height of Sample			2.560	in	6.50	cm
Average Diameter of Sample			2.860	in	7.26	cm
Area	6.42	in^2	41.45	cm^2		
Volume	269.50	cm^3	0.0095	ft^3		
Mass	455.80	g	1.00	lb		

Dry Density	68.4	pcf
Vol. of Voids	160.13	cm^3
Vol. of Solids	109.37	cm^3
Void Ratio	1.46	
Saturation	100.2	%

Moisture Content

Mass of wet sample & tare	611.50	g
Mass of dry sample & tare	451.00	g
Mass of tare	155.70	g
% Moisture	54.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
11/04/10	10	50	-	0.43	30.25	4.65	21.1	-	-	-	
11/04/10	10	51	60	0.43	30.25	4.65	21.1	2.97E-04	0.974	2.90E-04	
11/04/10	10	52	60	0.43	30.25	4.65	21.1	2.97E-04	0.974	2.90E-04	
11/04/10	10	53	60	0.43	30.25	4.65	21.1	2.97E-04	0.974	2.90E-04	*
11/04/10	10	54	60	0.43	30.25	4.65	21.1	2.97E-04	0.974	2.90E-04	*
11/04/10	10	55	60	0.43	30.25	4.65	21.1	2.97E-04	0.974	2.90E-04	*
11/04/10	10	56	60	0.43	30.25	4.65	21.1	2.97E-04	0.974	2.90E-04	*

Reported Average Hydraulic Conductivity* 2.9E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487:2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 85% of dry density (one point standard proctor) at as-received moisture content.

Flow pump ID #	244	Balance ID #	1/6/7	Differential Pressure Transducer ID #	263
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	246			Pore Pressure Transducer ID #	28

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AAP AASHTO R18

Tested By	RI
Date	12/06/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10882/PS-8	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-μm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	378.80
Mass of Dry Sample & Tare, g	298.40
Mass of Tare, g	99.50
Moisture Content, %	40.42

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.03
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	106.84

REMARKS

100% of total sample (19800 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	8.42
Percent of sample retained on No. 200 sieve, %	7.88
Percent of material finer than No. 200 sieve, %	**92.12**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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AAP AASHTO R18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10882/PS-8	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

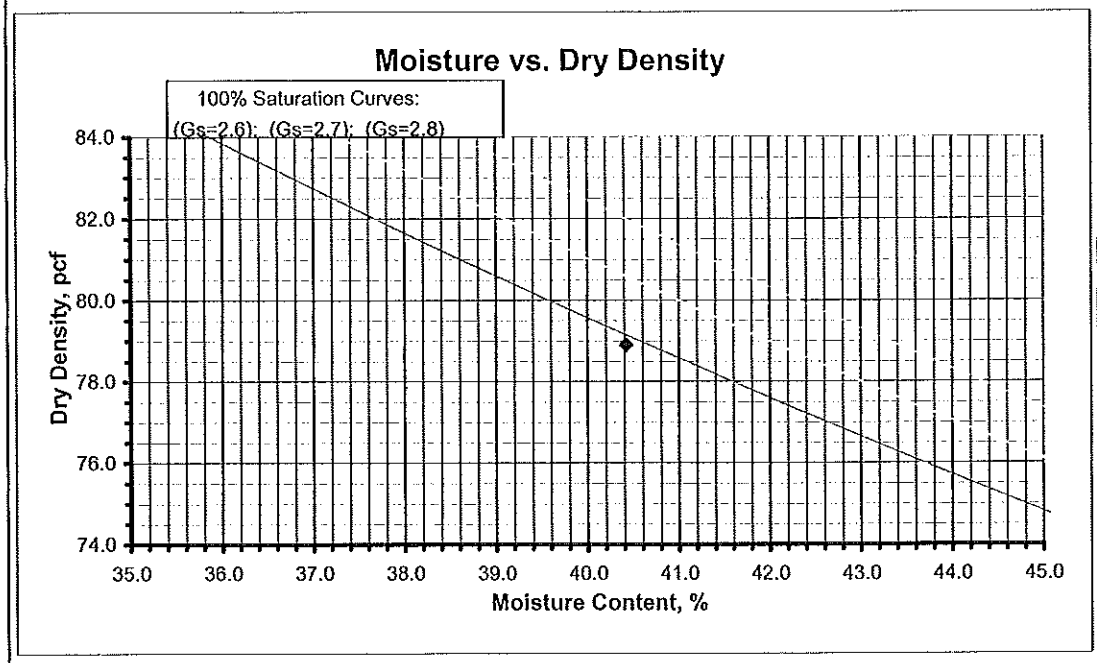
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	378.8	
Mass of Dry Sample & Tare, g	298.4	
Mass of Tare, g	99.5	
Moisture Content, %	40.4	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5924.0				
Mass of Wet Sample & Tare, g	378.8				
Mass of Dry Sample & Tare, g	298.4				
Mass of Tare, g	99.5				
Moisture Content, %	40.4				
Wet Density, pcf	110.8				
Dry Density, pcf	78.9				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	31
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% an material retained on 3/4" < 30%

REMARKS

DESCRIPTION

NA

USCS (ASTM D2487; D2488)

NA

Maximum Dry Density, pcf		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	KI
Date	12/07/10
Checked By	[illegible]

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10882/PS-8	Depth/Elev.	-
Location	-	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	2.581	in	6.56	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.82	cm^3	0.0095	ft^3
Mass	405.60	g	0.89	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	66.8	pcf		

Moisture Content

Mass of wet sample & tare	378.80	g
Mass of dry sample & tare	298.40	g
Mass of tare	99.50	g
% Moisture	40.4	

Test Data

Speed	2	
Board Number	1	
Cell Number	17	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	32.36	cm
Min Head	31.65	cm
Maximum Gradient	4.85	
Minimum Gradient	4.75	

Final Data (After Test)

Average Height of Sample			2.624	in	6.66	cm
Average Diameter of Sample			2.875	in	7.30	cm
Area	6.49	in^2	41.88	cm^2		
Volume	279.15	cm^3	0.0099	ft^3		
Mass	451.50	g	1.00	lb		

Dry Density	64.6	pcf
Vol. of Voids	170.12	cm^3
Vol. of Solids	109.02	cm^3
Void Ratio	1.56	
Saturation	95.6	%

Moisture Content

Mass of wet sample & tare	558.70	g
Mass of dry sample & tare	396.15	g
Mass of tare	107.30	g
% Moisture	56.3	

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	
12/07/10	8	45	-	0.46	32.36	4.85	16.1	-	-	-	
12/07/10	8	46	60	0.46	32.36	4.85	16.1	2.82E-04	1.104	3.11E-04	
12/07/10	8	47	60	0.45	31.65	4.75	16.1	2.85E-04	1.104	3.15E-04	
12/07/10	8	48	60	0.46	32.36	4.85	16.1	2.85E-04	1.104	3.15E-04	*
12/07/10	8	49	60	0.46	32.36	4.85	16.1	2.82E-04	1.104	3.11E-04	*
12/07/10	8	50	60	0.45	31.65	4.75	16.1	2.85E-04	1.104	3.15E-04	*
12/07/10	8	51	60	0.45	31.65	4.75	16.1	2.88E-04	1.104	3.18E-04	*

Reported Average Hydraulic Conductivity* 3.1E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 66.8 pcf of dry density (84.7% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AASHTO P18

Tested By	RI
Date	
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10883/PS-9	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	349.40
Mass of Dry Sample & Tare, g	278.80
Mass of Tare, g	101.00
Moisture Content, %	39.71

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.04
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	107.40

REMARKS

100% of total sample (20100 g) passed 3/4" sie

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	14.99
Percent of sample retained on No. 200 sieve, %	13.96
Percent of material finer than No. 200 sieve, %	**86.04**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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AASHTO R18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10883/PS-9	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

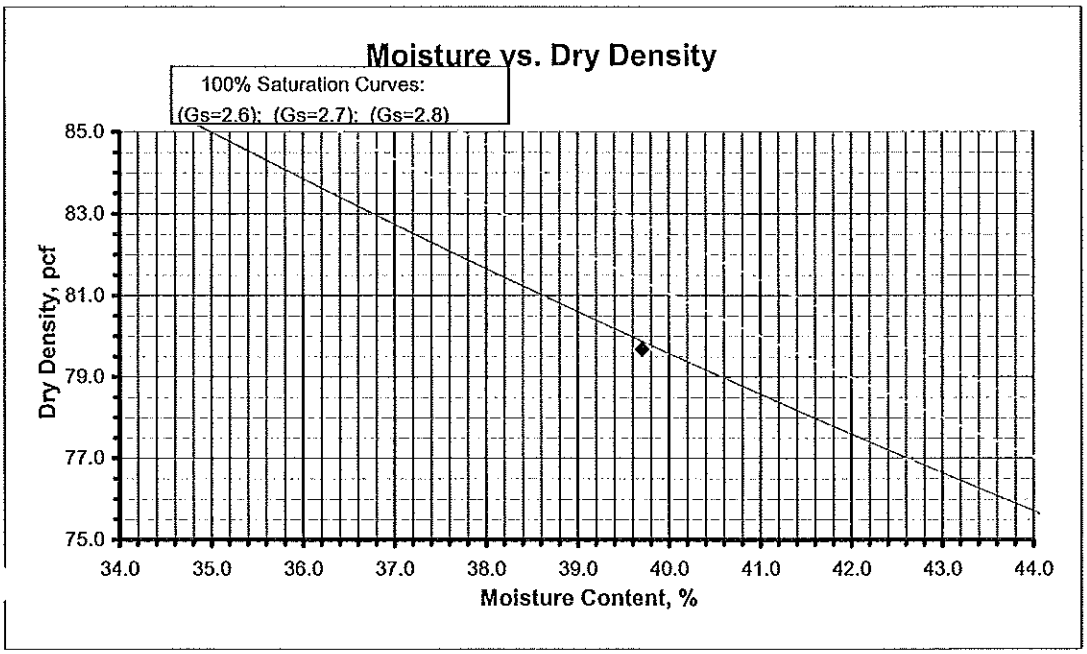
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	349.4	
Mass of Dry Sample & Tare, g	278.8	
Mass of Tare, g	101.0	
Moisture Content, %	39.7	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5932.0				
Mass of Wet Sample & Tare, g	349.4				
Mass of Dry Sample & Tare, g	278.8				
Mass of Tare, g	101.0				
Moisture Content, %	39.7				
Wet Density, pcf	111.3				
Dry Density, pcf	79.7				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	KI
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10883/PS-9	Depth/Elev.	-
Location	-	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	2.582	in	6.56	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.92	cm^3	0.0095	ft^3
Mass	408.30	g	0.90	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	67.6	pcf		

Moisture Content

Mass of wet sample & tare	349.40	g
Mass of dry sample & tare	278.80	g
Mass of tare	101.00	g
% Moisture	39.7	

Test Data

Speed	2	
Board Number	2	
Cell Number	12	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	31.65	cm
Min Head	30.25	cm
Maximum Gradient	4.73	
Minimum Gradient	4.52	

Final Data (After Test)

Average Height of Sample			2.637	in	6.70	cm
Average Diameter of Sample			2.874	in	7.30	cm
Area	6.49	in^2	41.85	cm^2		
Volume	280.33	cm^3	0.0099	ft^3		
Mass	454.60	g	1.00	lb		

Dry Density	65.1	pcf
Vol. of Voids	170.03	cm^3
Vol. of Solids	110.31	cm^3
Void Ratio	1.54	
Saturation	95.4	%

Moisture Content

Mass of wet sample & tare	553.00	g
Mass of dry sample & tare	390.75	g
Mass of tare	98.50	g
% Moisture	55.5	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/07/10	8	45	-	0.44	30.95	4.62	16.1	-	-	-	
12/07/10	8	46	60	0.45	31.65	4.73	16.1	2.93E-04	1.104	3.24E-04	
12/07/10	8	47	60	0.44	30.95	4.62	16.1	2.93E-04	1.104	3.24E-04	
12/07/10	8	48	60	0.44	30.95	4.62	16.1	2.97E-04	1.104	3.27E-04	*
12/07/10	8	49	60	0.43	30.25	4.52	16.1	3.00E-04	1.104	3.31E-04	*
12/07/10	8	50	60	0.45	31.65	4.73	16.1	2.97E-04	1.104	3.27E-04	*
12/07/10	8	51	60	0.44	30.95	4.62	16.1	2.93E-04	1.104	3.24E-04	*

Reported Average Hydraulic Conductivity* 3.3E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 67.6 pcf of dry density (84.8% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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AAP AASHTO P18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10884/PS-10	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	371.90
Mass of Dry Sample & Tare, g	296.50
Mass of Tare, g	112.60
Moisture Content, %	41.00

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.76
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	106.92

REMARKS

100% of total sample (19800 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	10.6
Percent of sample retained on No. 200 sieve, %	9.91
Percent of material finer than No. 200 sieve, %	**90.09**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test: B
Length of Soaking Period: Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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AAP AASHTO R18

Tested By	RI
Date	12/06/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10884/PS-10	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

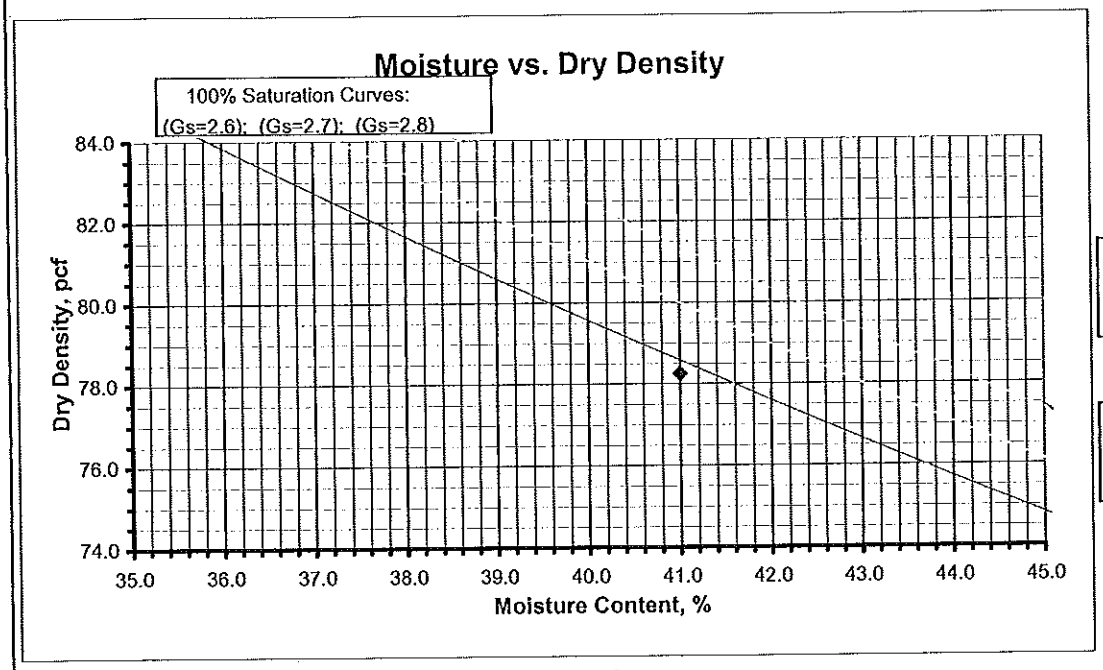
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	371.9	
Mass of Dry Sample & Tare, g	296.5	
Mass of Tare, g	112.6	
Moisture Content, %	41.0	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5917.0				
Mass of Wet Sample & Tare, g	371.9				
Mass of Dry Sample & Tare, g	296.5				
Mass of Tare, g	112.6				
Moisture Content, %	41.0				
Wet Density, pcf	110.3				
Dry Density, pcf	78.2				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	31b
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AASHTO R18

Tested By	KI
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 21	S. Type	Bulk
Sample ID	10884/PS-10	Depth/Elev.	-
Location	-	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	403.90	g	0.89	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	66.5	pcf		

Moisture Content

Mass of wet sample & tare	371.90	g
Mass of dry sample & tare	296.50	g
Mass of tare	112.60	g
% Moisture	41.0	

Test Data

Speed	2	
Board Number	3	
Cell Number	6	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	38.69	cm
Min Head	37.98	cm
Maximum Gradient	5.88	
Minimum Gradient	5.77	

Final Data (After Test)

Average Height of Sample			2.590	in	6.58	cm
Average Diameter of Sample			2.848	in	7.23	cm
Area	6.37	in^2	41.10	cm^2		
Volume	270.38	cm^3	0.0095	ft^3		
Mass	445.30	g	0.98	lb		

Dry Density	66.1	pcf
Vol. of Voids	164.27	cm^3
Vol. of Solids	106.11	cm^3
Void Ratio	1.55	
Saturation	96.7	%

Moisture Content

Mass of wet sample & tare	538.20	g
Mass of dry sample & tare	379.40	g
Mass of tare	92.90	g
% Moisture	55.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/07/10	9	2	-	0.55	38.69	5.88	16.1	-	-	-	
12/07/10	9	3	60	0.54	37.98	5.77	16.1	2.39E-04	1.104	2.64E-04	
12/07/10	9	4	60	0.55	38.69	5.88	16.1	2.39E-04	1.104	2.64E-04	
12/07/10	9	5	60	0.54	37.98	5.77	16.1	2.39E-04	1.104	2.64E-04	*
12/07/10	9	6	60	0.55	38.69	5.88	16.1	2.39E-04	1.104	2.64E-04	*
12/07/10	9	7	60	0.54	37.98	5.77	16.1	2.39E-04	1.104	2.64E-04	*
12/07/10	9	8	60	0.54	37.98	5.77	16.1	2.42E-04	1.104	2.67E-04	*

Reported Average Hydraulic Conductivity* 2.7E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 66.5 pcf of dry density (85.1% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAP AASHTO P18

Tested By	RI
Date	1 0
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10885/PS-11	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	332.60
Mass of Dry Sample & Tare, g	268.40
Mass of Tare, g	94.00
Moisture Content, %	36.81

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.61
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	110.09

REMARKS

100% of total sample (18600 g) passed 3/4" siev

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	5.3
Percent of sample retained on No. 200 sieve, %	4.81
Percent of material finer than No. 200 sieve, %	**95.19**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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Tested By	RI
Date	12/06/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10885/PS-11	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

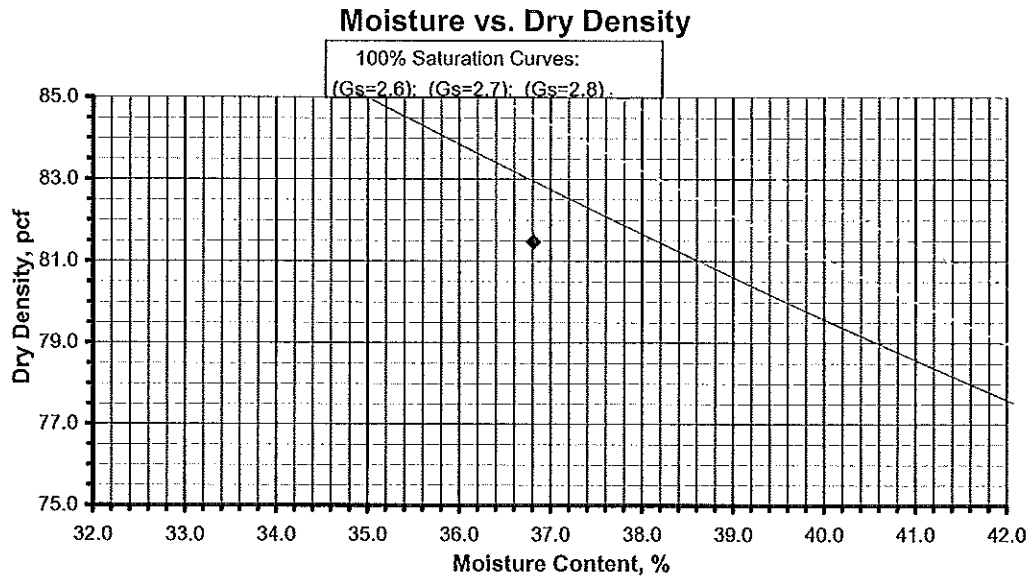
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	332.6	
Mass of Dry Sample & Tare, g	268.4	
Mass of Tare, g	94.0	
Moisture Content, %	36.8	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5934.0				
Mass of Wet Sample & Tare, g	332.6				
Mass of Dry Sample & Tare, g	268.4				
Mass of Tare, g	94.0				
Moisture Content, %	36.8				
Wet Density, pcf	111.5				
Dry Density, pcf	81.5				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	KI
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10885/PS-11	Depth/Elev.	-
Location	-	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	2.576	in	6.54	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	269.29	cm^3	0.0095	ft^3
Mass	408.70	g	0.90	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	69.2	pcf		

Moisture Content

Mass of wet sample & tare	332.60	g
Mass of dry sample & tare	268.40	g
Mass of tare	94.00	g
% Moisture	36.8	

Test Data

Speed	2	
Board Number	4	
Cell Number	8	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	20.40	cm
Min Head	19.70	cm
Maximum Gradient	3.06	
Minimum Gradient	2.95	

Final Data (After Test)

Average Height of Sample			2.628	in	6.68	cm
Average Diameter of Sample			2.870	in	7.29	cm
Area	6.47	in^2	41.74	cm^2		
Volume	278.60	cm^3	0.0098	ft^3		
Mass	457.00	g	1.01	lb		

Dry Density	66.9	pcf
Vol. of Voids	165.83	cm^3
Vol. of Solids	112.77	cm^3
Void Ratio	1.47	
Saturation	95.4	%

Moisture Content

Mass of wet sample & tare	542.10	g
Mass of dry sample & tare	384.00	g
Mass of tare	85.30	g
% Moisture	52.9	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/07/10	9	2	-	0.29	20.40	3.06	16.1	-	-	-	
12/07/10	9	3	60	0.28	19.70	2.95	16.1	4.57E-04	1.104	5.05E-04	
12/07/10	9	4	60	0.29	20.40	3.06	16.1	4.57E-04	1.104	5.05E-04	
12/07/10	9	5	60	0.29	20.40	3.06	16.1	4.50E-04	1.104	4.97E-04	*
12/07/10	9	6	60	0.28	19.70	2.95	16.1	4.57E-04	1.104	5.05E-04	*
12/07/10	9	7	60	0.28	19.70	2.95	16.1	4.66E-04	1.104	5.14E-04	*
12/07/10	9	8	60	0.28	19.70	2.95	16.1	4.66E-04	1.104	5.14E-04	*

Reported Average Hydraulic Conductivity* 5.1E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 69.2 pcf of dry density (85.0% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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Tested By	RI
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10886/PS-12	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	330.50
Mass of Dry Sample & Tare, g	270.50
Mass of Tare, g	101.00
Moisture Content, %	35.40

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	151.24
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	111.70

REMARKS

100% of total sample (20800 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	25.18
Percent of sample retained on No. 200 sieve, %	22.54
Percent of material finer than No. 200 sieve, %	**77.46**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10886/PS-12	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

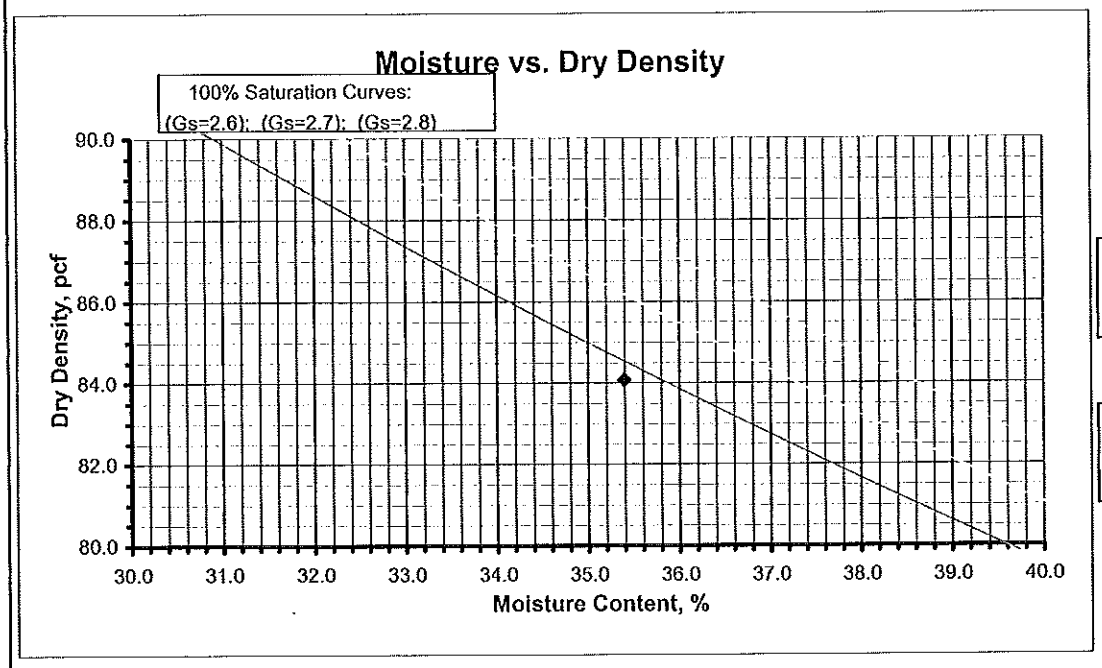
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	330.5	
Mass of Dry Sample & Tare, g	270.5	
Mass of Tare, g	101.0	
Moisture Content, %	35.4	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5970.0				
Mass of Wet Sample & Tare, g	330.5				
Mass of Dry Sample & Tare, g	270.5				
Mass of Tare, g	101.0				
Moisture Content, %	35.4				
Wet Density, pcf	113.8				
Dry Density, pcf	84.1				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	31o
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% an material retained on 3/4" < 30%

REMARKS

DESCRIPTION

NA

USCS (ASTM D2487; D2488): NA

Maximum Dry Density, pcf		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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Tested By	VG
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10886/PS-12	Depth/Elev.	-
Location	-	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	2.562	in	6.51	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	267.83	cm^3	0.0095	ft^3
Mass	416.30	g	0.92	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	71.6	pcf		

Moisture Content

Mass of wet sample & tare	330.50	g
Mass of dry sample & tare	270.50	g
Mass of tare	101.00	g
% Moisture	35.4	

Test Data

Speed	2	
Board Number	2	
Cell Number	9	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	19.70	cm
Min Head	19.70	cm
Maximum Gradient	3.01	
Minimum Gradient	3.01	

Final Data (After Test)

Average Height of Sample			2.578	in	6.55	cm
Average Diameter of Sample			2.888	in	7.34	cm
Area	6.55	in^2	42.26	cm^2		
Volume	276.74	cm^3	0.0098	ft^3		
Mass	460.70	g	1.02	lb		

Dry Density	69.4	pcf
Vol. of Voids	160.60	cm^3
Vol. of Solids	116.14	cm^3
Void Ratio	1.38	
Saturation	95.2	%

Moisture Content

Mass of wet sample & tare	718.10	g
Mass of dry sample & tare	565.30	g
Mass of tare	257.80	g
% Moisture	49.7	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/08/10	18	45	-	0.28	19.70	3.01	19.4	-	-	-	
12/08/10	18	46	60	0.28	19.70	3.01	19.4	4.51E-04	1.015	4.58E-04	
12/08/10	18	47	60	0.28	19.70	3.01	19.4	4.51E-04	1.015	4.58E-04	
12/08/10	18	48	60	0.28	19.70	3.01	19.4	4.51E-04	1.015	4.58E-04	*
12/08/10	18	49	60	0.28	19.70	3.01	19.4	4.51E-04	1.015	4.58E-04	*
12/08/10	18	50	60	0.28	19.70	3.01	19.4	4.51E-04	1.015	4.58E-04	*
12/08/10	18	51	60	0.28	19.70	3.01	19.4	4.51E-04	1.015	4.58E-04	*

Reported Average Hydraulic Conductivity* 4.6E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 71.6 pcf of dry density (85.2% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	64
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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AAP AASHTO P18

Tested By	RI
Date	1 0
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10887/PS-13	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	365.00
Mass of Dry Sample & Tare, g	280.90
Mass of Tare, g	101.10
Moisture Content, %	46.77

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	151.30
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	103.08

REMARKS

100% of total sample (20000 g) passed 3/4" sie

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	8.4
Percent of sample retained on No. 200 sieve, %	8.15
Percent of material finer than No. 200 sieve, %	**91.85**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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AAP AASHTO P18

Tested By	IN
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10887/PS-13	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

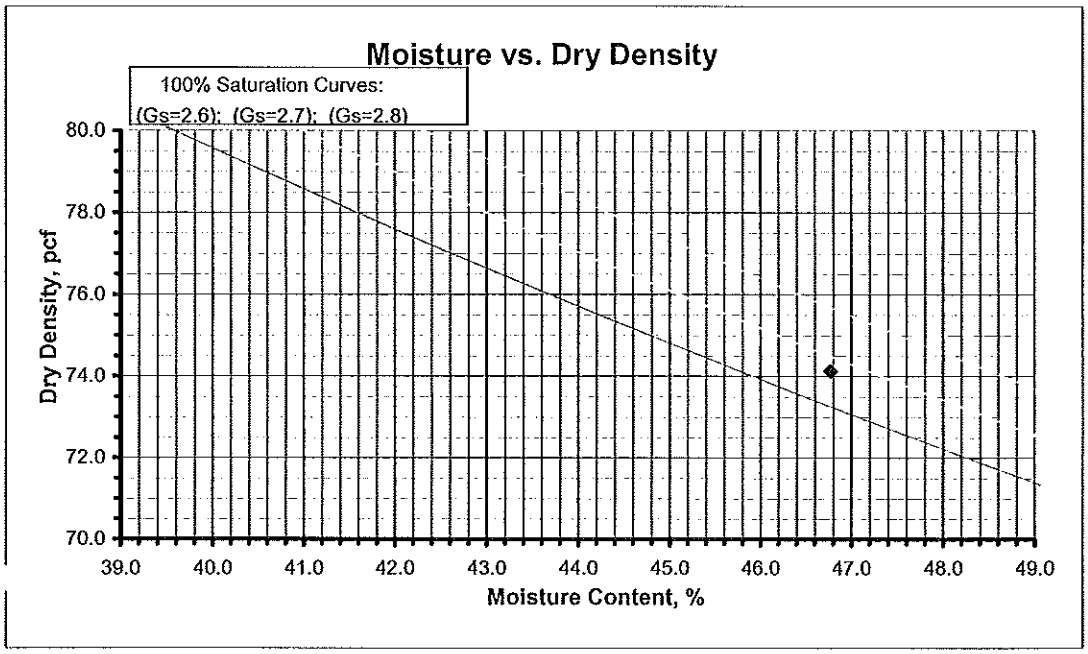
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	365.0	
Mass of Dry Sample & Tare, g	280.9	
Mass of Tare, g	101.1	
Moisture Content, %	46.8	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5894.0				
Mass of Wet Sample & Tare, g	365.0				
Mass of Dry Sample & Tare, g	280.9				
Mass of Tare, g	101.1				
Moisture Content, %	46.8				
Wet Density, pcf	108.8				
Dry Density, pcf	74.1				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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Tested By	VG
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 21	S. Type	Bulk
Sample ID	10887/PS-13	Depth/Elev.	-
Location	-	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	2.563	in	6.51	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	267.93	cm^3	0.0095	ft^3
Mass	397.70	g	0.88	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	63.1	pcf		

Moisture Content

Mass of wet sample & tare	365.00	g
Mass of dry sample & tare	280.90	g
Mass of tare	101.10	g
% Moisture	46.8	

Test Data

Speed	2	
Board Number	3	
Cell Number	18	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	19.70	cm
Min Head	19.70	cm
Maximum Gradient	3.03	
Minimum Gradient	3.03	

Final Data (After Test)

Average Height of Sample			2.558	in	6.50	cm
Average Diameter of Sample			2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2		
Volume	268.73	cm^3	0.0095	ft^3		
Mass	437.80	g	0.97	lb		

Dry Density	64.6	pcf
Vol. of Voids	165.62	cm^3
Vol. of Solids	103.11	cm^3
Void Ratio	1.61	
Saturation	96.3	%

Moisture Content

Mass of wet sample & tare	511.60	g
Mass of dry sample & tare	352.30	g
Mass of tare	74.10	g
% Moisture	57.3	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/08/10	18	45	-	0.28	19.70	3.03	19.4	-	-	-	
12/08/10	18	46	60	0.28	19.70	3.03	19.4	4.57E-04	1.015	4.64E-04	
12/08/10	18	47	60	0.28	19.70	3.03	19.4	4.57E-04	1.015	4.64E-04	
12/08/10	18	48	60	0.28	19.70	3.03	19.4	4.57E-04	1.015	4.64E-04	*
12/08/10	18	49	60	0.28	19.70	3.03	19.4	4.57E-04	1.015	4.64E-04	*
12/08/10	18	50	60	0.28	19.70	3.03	19.4	4.57E-04	1.015	4.64E-04	*
12/08/10	18	51	60	0.28	19.70	3.03	19.4	4.57E-04	1.015	4.64E-04	*

Reported Average Hydraulic Conductivity* 4.6E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 63.1 pcf of dry density (85.2% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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Tested By	RI
Date	12/08/10
Checked By	CB

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10888/PS-14	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	341.60
Mass of Dry Sample & Tare, g	270.40
Mass of Tare, g	83.70
Moisture Content, %	38.14

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.80
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	109.17

REMARKS

100% of total sample (21300 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	7.54
Percent of sample retained on No. 200 sieve, %	6.91
Percent of material finer than No. 200 sieve, %	**93.09**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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Tested By	IN
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10888/PS-14	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

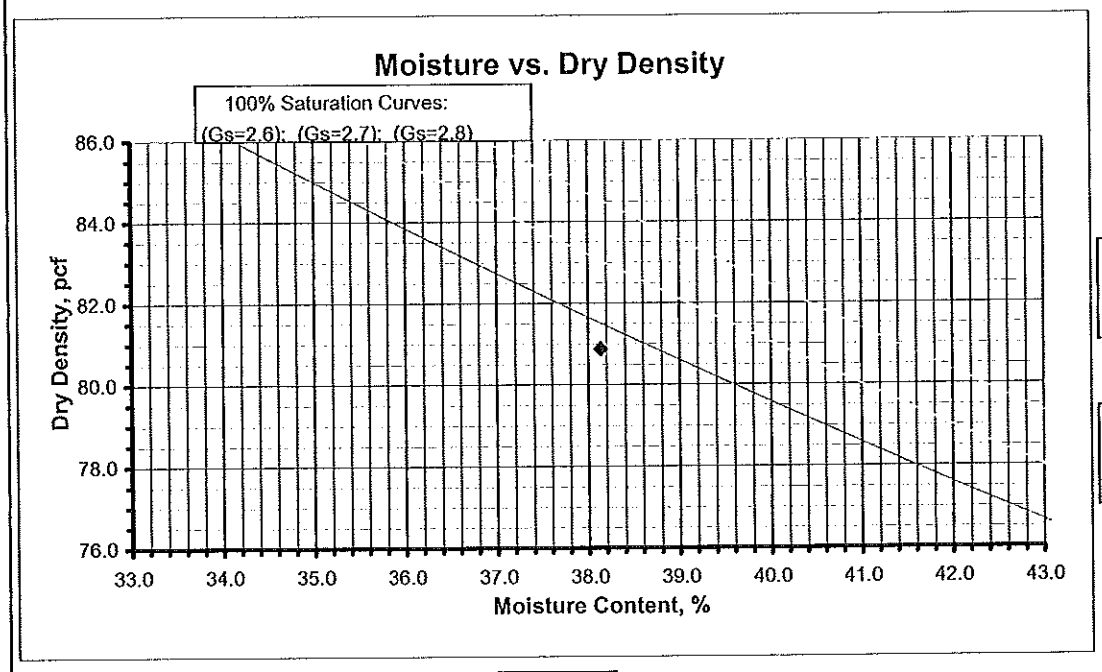
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	341.6	
Mass of Dry Sample & Tare, g	270.4	
Mass of Tare, g	83.7	
Moisture Content, %	38.1	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5938.0				
Mass of Wet Sample & Tare, g	341.6				
Mass of Dry Sample & Tare, g	270.4				
Mass of Tare, g	83.7				
Moisture Content, %	38.1				
Wet Density, pcf	111.7				
Dry Density, pcf	80.9				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	31
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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Tested By	VG
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10888/PS-14	Depth/Elev.	-
Location	-	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	2.573	in	6.54	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.98	cm^3	0.0095	ft^3
Mass	408.80	g	0.90	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	68.7	pcf		

Moisture Content

Mass of wet sample & tare	341.60	g
Mass of dry sample & tare	270.40	g
Mass of tare	83.70	g
% Moisture	38.1	

Test Data

Speed	2	
Board Number	4	
Cell Number	10	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	26.73	cm
Min Head	26.73	cm
Maximum Gradient	4.02	
Minimum Gradient	4.02	

Final Data (After Test)

Average Height of Sample	2.615	in	6.64	cm
Average Diameter of Sample	2.880	in	7.32	cm
Area	6.51 in^2		42.03	cm^2
Volume	279.16	cm^3	0.0099	ft^3
Mass	456.10	g	1.01	lb

Dry Density	66.3	pcf
Vol. of Voids	167.25	cm^3
Vol. of Solids	111.91	cm^3
Void Ratio	1.49	
Saturation	95.4	%

Moisture Content

Mass of wet sample & tare	524.10	g
Mass of dry sample & tare	364.70	g
Mass of tare	68.40	g
% Moisture	53.8	

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	
12/08/10	18	56	-	0.38	26.73	4.02	19.4	-	-	-	
12/08/10	18	57	60	0.38	26.73	4.02	19.4	3.39E-04	1.015	3.44E-04	
12/08/10	18	58	60	0.38	26.73	4.02	19.4	3.39E-04	1.015	3.44E-04	
12/08/10	18	59	60	0.38	26.73	4.02	19.4	3.39E-04	1.015	3.44E-04	*
12/08/10	19	0	60	0.38	26.73	4.02	19.4	3.39E-04	1.015	3.44E-04	*
12/08/10	19	1	60	0.38	26.73	4.02	19.4	3.39E-04	1.015	3.44E-04	*
12/08/10	19	2	60	0.38	26.73	4.02	19.4	3.39E-04	1.015	3.44E-04	*

Reported Average Hydraulic Conductivity* 3.4E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 68.7 pcf of dry density (84.9% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

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AASHTO P18

Tested By	RI
Date	12
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10889/PS-15	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	358.00
Mass of Dry Sample & Tare, g	287.50
Mass of Tare, g	101.50
Moisture Content, %	37.90

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	151.20
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	109.64

REMARKS

100% of total sample (19300 g) passed 3/4" siev

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	20.67
Percent of sample retained on No. 200 sieve, %	18.85
Percent of material finer than No. 200 sieve, %	**81.15**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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AAR AASHTO R18

Tested By	IN
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 21	S. Type	Bulk
Sample ID	10889/PS-15	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

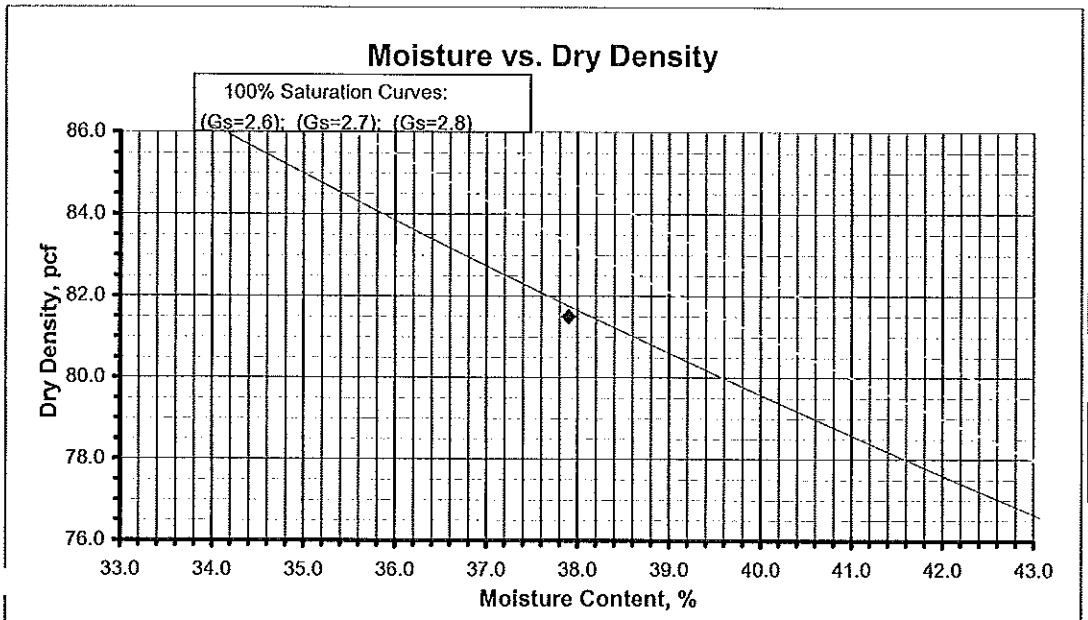
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	358.0	
Mass of Dry Sample & Tare, g	287.5	
Mass of Tare, g	101.5	
Moisture Content, %	37.9	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5948.0				
Mass of Wet Sample & Tare, g	358.0				
Mass of Dry Sample & Tare, g	287.5				
Mass of Tare, g	101.5				
Moisture Content, %	37.9				
Wet Density, pcf	112.4				
Dry Density, pcf	81.5				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	VG
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10889/PS-15	Depth/Elev.	-
Location	-	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	2.564	in	6.51	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.04	cm^3	0.0095	ft^3
Mass	410.70	g	0.91	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	69.3	pcf		

Moisture Content

Mass of wet sample & tare	358.00	g
Mass of dry sample & tare	287.50	g
Mass of tare	101.50	g
% Moisture	37.9	

Test Data

Speed	2	
Board Number	11	
Cell Number	5	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	24.62	cm
Min Head	24.62	cm
Maximum Gradient	3.78	
Minimum Gradient	3.78	

Final Data (After Test)

Average Height of Sample			2.566	in	6.52 cm
Average Diameter of Sample			2.883	in	7.32 cm
Area	6.53	in^2	42.12	cm^2	
Volume	274.50	cm^3	0.0097	ft^3	
Mass	454.50	g	1.00	lb	

Dry Density	68.0	pcf
Vol. of Voids	161.60	cm^3
Vol. of Solids	112.89	cm^3
Void Ratio	1.43	
Saturation	96.1	%

Moisture Content

Mass of wet sample & tare	523.40	g
Mass of dry sample & tare	368.20	g
Mass of tare	69.30	g
% Moisture	51.9	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/07/10	18	55	-	0.35	24.62	3.78	19.4	-	-	-	
12/07/10	18	56	60	0.35	24.62	3.78	19.4	3.60E-04	1.015	3.66E-04	
12/07/10	18	57	60	0.35	24.62	3.78	19.4	3.60E-04	1.015	3.66E-04	
12/07/10	18	58	60	0.35	24.62	3.78	19.4	3.60E-04	1.015	3.66E-04	*
12/07/10	18	59	60	0.35	24.62	3.78	19.4	3.60E-04	1.015	3.66E-04	*
12/07/10	19	0	60	0.35	24.62	3.78	19.4	3.60E-04	1.015	3.66E-04	*
12/07/10	19	1	60	0.35	24.62	3.78	19.4	3.60E-04	1.015	3.66E-04	*

Reported Average Hydraulic Conductivity* 3.7E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 69.3 pcf of dry density (85.1% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	140			Pore Pressure Transducer ID #	28

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AAP AASHTO P18

Tested By	RI
Date	12/08/10
Checked By	LB

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10890/PS-16	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	375.00
Mass of Dry Sample & Tare, g	293.80
Mass of Tare, g	86.80
Moisture Content, %	39.23

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	151.00
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	108.46

REMARKS

100% of total sample (20000 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	6.76
Percent of sample retained on No. 200 sieve, %	6.23
Percent of material finer than No. 200 sieve, %	**93.77**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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AAP AASHTO R18

Tested By	IN
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10890/PS-16	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

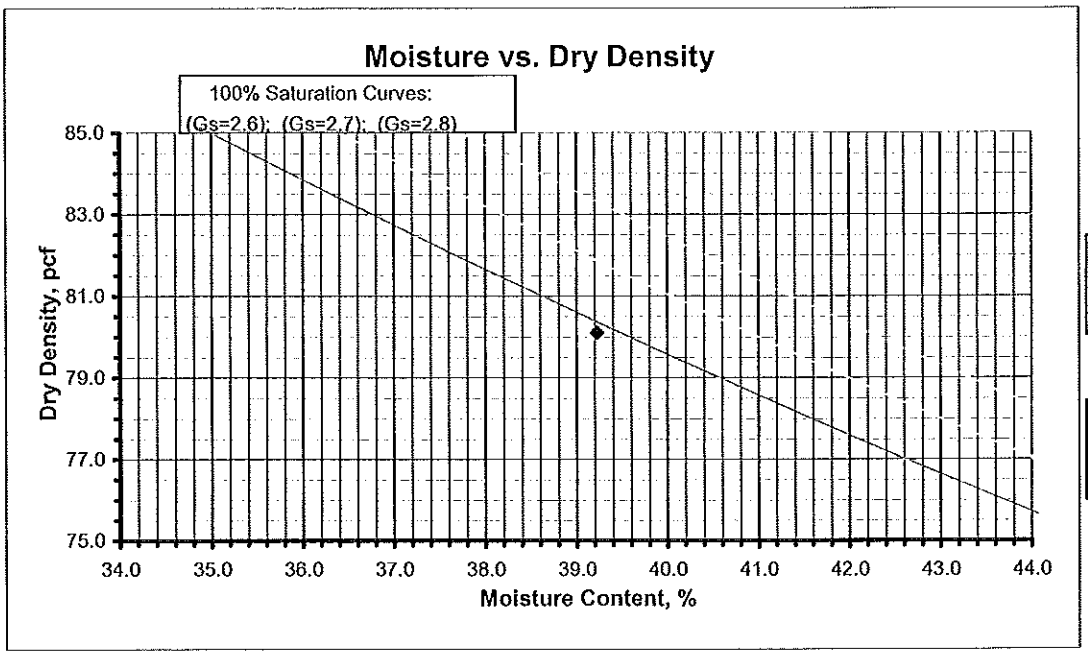
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	375.0	
Mass of Dry Sample & Tare, g	293.8	
Mass of Tare, g	86.8	
Moisture Content, %	39.2	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5935.0				
Mass of Wet Sample & Tare, g	375.0				
Mass of Dry Sample & Tare, g	293.8				
Mass of Tare, g	86.8				
Moisture Content, %	39.2				
Wet Density, pcf	111.5				
Dry Density, pcf	80.1				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	31
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	VG
Date	12/08/10
Checked By	VG

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10890/PS-16	Depth/Elev.	-
Location	-	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	2.568	in	6.52	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.46	cm^3	0.0095	ft^3
Mass	407.80	g	0.90	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	68.1	pcf		

Moisture Content

Mass of wet sample & tare	375.00	g
Mass of dry sample & tare	293.80	g
Mass of tare	86.80	g
% Moisture	39.2	

Test Data

Speed	2	
Board Number	12	
Cell Number	11	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	28.84	cm
Min Head	28.84	cm
Maximum Gradient	4.37	
Minimum Gradient	4.37	

Final Data (After Test)

Average Height of Sample			2.600	in	6.60	cm
Average Diameter of Sample			2.888	in	7.34	cm
Area	6.55	in^2	42.26	cm^2		
Volume	279.10	cm^3	0.0099	ft^3		
Mass	456.60	g	1.01	lb		

Dry Density	66.6	pcf
Vol. of Voids	166.76	cm^3
Vol. of Solids	112.34	cm^3
Void Ratio	1.48	
Saturation	95.3	%

Moisture Content

Mass of wet sample & tare	529.80	g
Mass of dry sample & tare	371.10	g
Mass of tare	73.80	g
% Moisture	53.4	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/08/10	19	5	-	0.41	28.84	4.37	19.4	-	-	-	
12/08/10	19	6	60	0.41	28.84	4.37	19.4	3.11E-04	1.015	3.15E-04	
12/08/10	19	7	60	0.41	28.84	4.37	19.4	3.11E-04	1.015	3.15E-04	
12/08/10	19	8	60	0.41	28.84	4.37	19.4	3.11E-04	1.015	3.15E-04	*
12/08/10	19	9	60	0.41	28.84	4.37	19.4	3.11E-04	1.015	3.15E-04	*
12/08/10	19	10	60	0.41	28.84	4.37	19.4	3.11E-04	1.015	3.15E-04	*
12/08/10	19	11	60	0.41	28.84	4.37	19.4	3.11E-04	1.015	3.15E-04	*

Reported Average Hydraulic Conductivity* 3.2E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 68.1 pcf of dry density (85.0% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

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AASHTO P18

Tested By	RI
Date	1( )
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10891/PS-17	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	344.70
Mass of Dry Sample & Tare, g	279.20
Mass of Tare, g	92.90
Moisture Content, %	35.16

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.55
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	111.39

REMARKS

100% of total sample (21100 g) passed 3/4" siev

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	21.59
Percent of sample retained on No. 200 sieve, %	19.38
Percent of material finer than No. 200 sieve, %	**80.62**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B
Length of Soaking Period:	Overnight

Sieve No. 200 ID #	38/86
Sieve Shaker ID #	54/130

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AAR AASHTO R18

Tested By	IN
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10891/PS-17	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

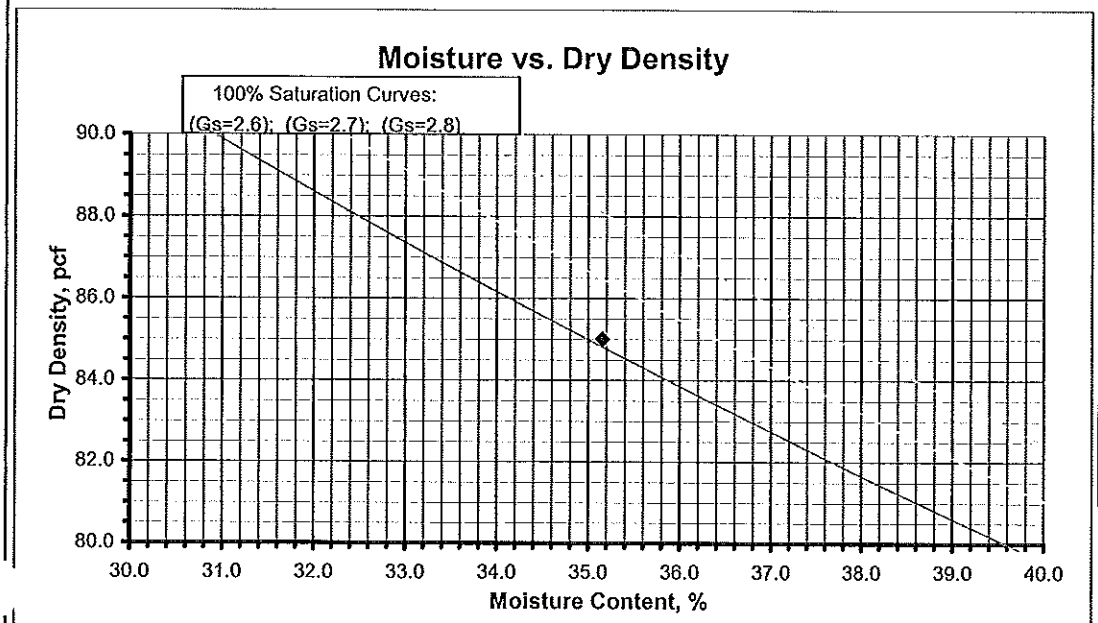
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	344.7	
Mass of Dry Sample & Tare, g	279.2	
Mass of Tare, g	92.9	
Moisture Content, %	35.2	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5986.0				
Mass of Wet Sample & Tare, g	344.7				
Mass of Dry Sample & Tare, g	279.2				
Mass of Tare, g	92.9				
Moisture Content, %	35.2				
Wet Density, pcf	114.9				
Dry Density, pcf	85.0				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAP AASHTO R18

Tested By	VG
Date	12/09/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 21	S. Type	Bulk
Sample ID	10891/PS-17	Depth/Elev.	-
Location	-	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	2.559	in	6.50	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	267.52	cm^3	0.0094	ft^3
Mass	420.30	g	0.93	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	72.5	pcf		

Moisture Content

Mass of wet sample & tare	344.70	g
Mass of dry sample & tare	279.20	g
Mass of tare	92.90	g
% Moisture	35.2	

Test Data

Speed	2	
Board Number	3	
Cell Number	20	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	21.10	cm
Min Head	21.10	cm
Maximum Gradient	3.25	
Minimum Gradient	3.25	

Final Data (After Test)

Average Height of Sample			2.556	in	6.49	cm
Average Diameter of Sample			2.883	in	7.32	cm
Area	6.53	in^2	42.12	cm^2		
Volume	273.43	cm^3	0.0097	ft^3		
Mass	468.10	g	1.03	lb		

Dry Density	71.3	pcf
Vol. of Voids	157.72	cm^3
Vol. of Solids	115.70	cm^3
Void Ratio	1.36	
Saturation	98.7	%

Moisture Content

Mass of wet sample & tare	563.90	g
Mass of dry sample & tare	408.40	g
Mass of tare	96.40	g
% Moisture	49.8	

TIME FUNCTION DATE	HOUR	MIN	Δ t (sec)	READING (psi)	Head (cm)	Gradient	Temp. T_x(°C)	PERMEABILITY (cm/sec) @ T_x	R_T	@ 20 °C	
12/09/10	18	45	-	0.30	21.10	3.25	18.9	-	-	-	
12/09/10	18	46	60	0.30	21.10	3.25	18.9	4.19E-04	1.028	4.31E-04	
12/09/10	18	47	60	0.30	21.10	3.25	18.9	4.19E-04	1.028	4.31E-04	
12/09/10	18	48	60	0.30	21.10	3.25	18.9	4.19E-04	1.028	4.31E-04	*
12/09/10	18	49	60	0.30	21.10	3.25	18.9	4.19E-04	1.028	4.31E-04	*
12/09/10	18	50	60	0.30	21.10	3.25	18.9	4.19E-04	1.028	4.31E-04	*
12/09/10	18	51	60	0.30	21.10	3.25	18.9	4.19E-04	1.028	4.31E-04	*

Reported Average Hydraulic Conductivity* 4.3E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487:2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 72.5 pcf of dry density (85.4% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	140			Pore Pressure Transducer ID #	26/27

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AAP AASHTO R18

Tested By	RI
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10892/PS-18	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	353.70
Mass of Dry Sample & Tare, g	264.10
Mass of Tare, g	94.90
Moisture Content, %	52.96

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	151.14
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	98.81

REMARKS

100% of total sample (16800 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	3.26
Percent of sample retained on No. 200 sieve, %	3.30
Percent of material finer than No. 200 sieve, %	**96.70**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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Tested By	IN
Date	12/07/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10892/PS-18	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

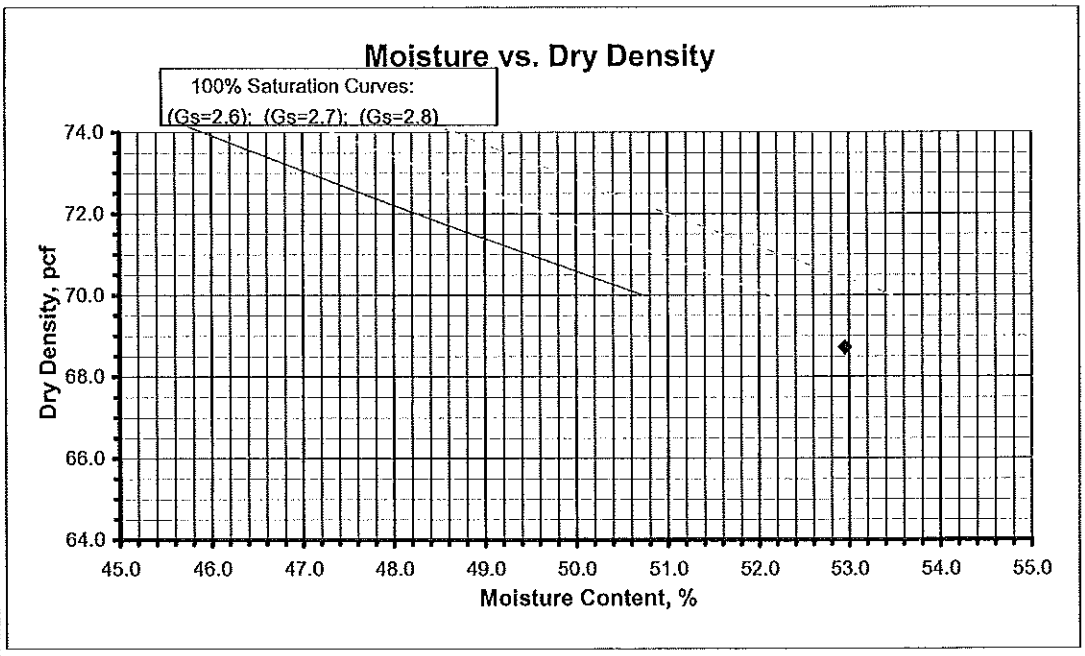
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	353.7	
Mass of Dry Sample & Tare, g	264.1	
Mass of Tare, g	94.9	
Moisture Content, %	53.0	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5838.0				
Mass of Wet Sample & Tare, g	353.7				
Mass of Dry Sample & Tare, g	264.1				
Mass of Tare, g	94.9				
Moisture Content, %	53.0				
Wet Density, pcf	105.1				
Dry Density, pcf	68.7				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	316
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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AAR AASHTO R18

Tested By	VG
Date	12/09/10
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10892/PS-18	Depth/Elev.	-
Location	-	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	2.572	in	6.53	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.88	cm^3	0.0095	ft^3
Mass	384.50	g	0.85	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	58.3	pcf		

Moisture Content

Mass of wet sample & tare	353.70	g
Mass of dry sample & tare	264.10	g
Mass of tare	94.90	g
% Moisture	53.0	

Test Data

Speed	2	
Board Number	4	
Cell Number	21	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	21.10	cm
Min Head	21.10	cm
Maximum Gradient	3.22	
Minimum Gradient	3.22	

Final Data (After Test)

Average Height of Sample		2.578	in	6.55	cm
Average Diameter of Sample		2.839	in	7.21	cm
Area	6.33 in^2	40.84	cm^2		
Volume	267.43 cm^3	0.0094	ft^3		
Mass	423.80 g	0.93	lb		

Dry Density	59.0	pcf
Vol. of Voids	173.73	cm^3
Vol. of Solids	93.70	cm^3
Void Ratio	1.85	
Saturation	98.3	%

Moisture Content

Mass of wet sample & tare	501.60	g
Mass of dry sample & tare	330.90	g
Mass of tare	78.10	g
% Moisture	67.5	

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	
12/09/10	18	45	-	0.30	21.10	3.22	18.9	-	-	-	
12/09/10	18	46	60	0.30	21.10	3.22	18.9	4.36E-04	1.028	4.48E-04	
12/09/10	18	47	60	0.30	21.10	3.22	18.9	4.36E-04	1.028	4.48E-04	
12/09/10	18	48	60	0.30	21.10	3.22	18.9	4.36E-04	1.028	4.48E-04	*
12/09/10	18	49	60	0.30	21.10	3.22	18.9	4.36E-04	1.028	4.48E-04	*
12/09/10	18	50	60	0.30	21.10	3.22	18.9	4.36E-04	1.028	4.48E-04	*
12/09/10	18	51	60	0.30	21.10	3.22	18.9	4.36E-04	1.028	4.48E-04	*

Reported Average Hydraulic Conductivity* 4.5E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 58.3 pcf of dry density (85.0% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	29
Syringe ID #	141			Pore Pressure Transducer ID #	26/27

TIMELY ENGINEERING SOIL TESTS, LLC

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

AAP AASHTO P18

Tested By	RI
Date	1 0
Checked By	VB

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10893/PS-19	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	345.80
Mass of Dry Sample & Tare, g	270.00
Mass of Tare, g	73.00
Moisture Content, %	38.48

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.15
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	108.43

REMARKS

100% of total sample (19700 g) passed 3/4" sie

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	13.04
Percent of sample retained on No. 200 sieve, %	12.03
Percent of material finer than No. 200 sieve, %	**87.97**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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AASHTO R18

Tested By	RI
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10893/PS-19	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

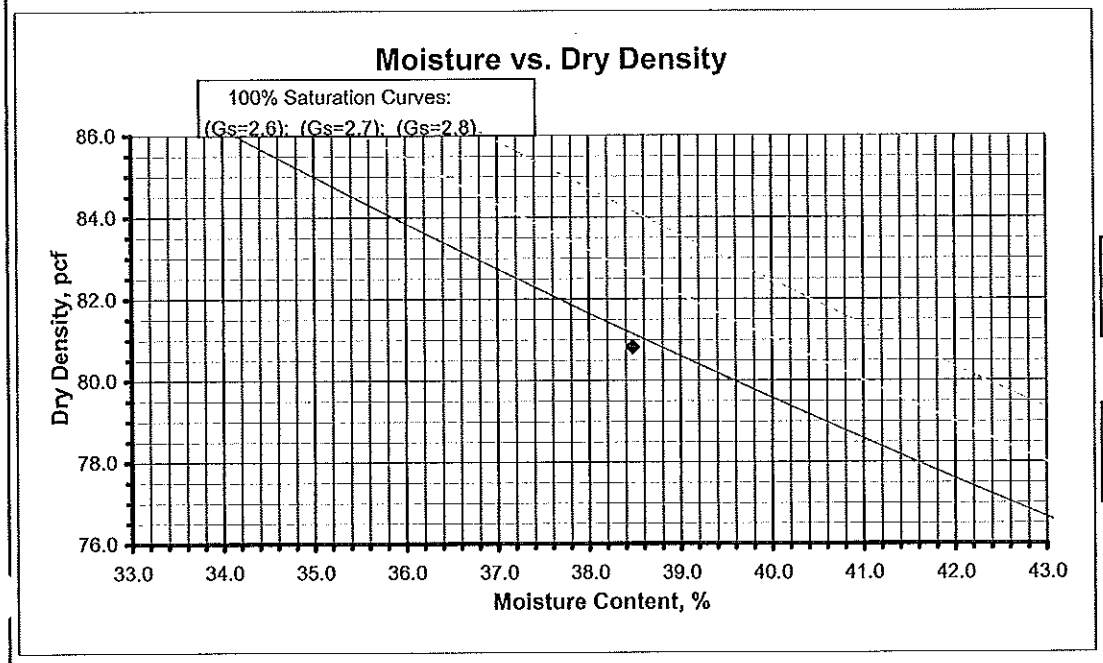
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	345.8	
Mass of Dry Sample & Tare, g	270.0	
Mass of Tare, g	73.0	
Moisture Content, %	38.5	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5941.0				
Mass of Wet Sample & Tare, g	345.8				
Mass of Dry Sample & Tare, g	270.0				
Mass of Tare, g	73.0				
Moisture Content, %	38.5				
Wet Density, pcf	111.9				
Dry Density, pcf	80.8				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0333
Hammer ID Number	318
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

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Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	VG
Date	12/09/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 21	S. Type	Bulk
Sample ID	10893/PS-19	Depth/Elev.	-
Location	-	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	2.571	in	6.53	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.77	cm^3	0.0095	ft^3
Mass	409.70	g	0.90	lb
Specific Gravity	2.650	(Assumed)		
Dry Density	68.7	pcf		

Moisture Content

Mass of wet sample & tare	345.80	g
Mass of dry sample & tare	270.00	g
Mass of tare	73.00	g
% Moisture	38.5	

Test Data

Speed	2	
Board Number	11	
Cell Number	22	
Flow Pump Number	1A	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	24.62	cm
Min Head	24.62	cm
Maximum Gradient	3.80	
Minimum Gradient	3.80	

Final Data (After Test)

Average Height of Sample			2.552	in	6.48	cm
Average Diameter of Sample			2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2		
Volume	266.78	cm^3	0.0094	ft^3		
Mass	444.00	g	0.98	lb		

Dry Density	69.2	pcf
Vol. of Voids	155.11	cm^3
Vol. of Solids	111.67	cm^3
Void Ratio	1.39	
Saturation	95.5	%

Moisture Content

Mass of wet sample & tare	519.50	g
Mass of dry sample & tare	371.50	g
Mass of tare	75.70	g
% Moisture	50.0	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/09/10	19	1	-	0.35	24.62	3.80	18.9	-	-	-	
12/09/10	19	2	60	0.35	24.62	3.80	18.9	3.67E-04	1.028	3.77E-04	
12/09/10	19	3	60	0.35	24.62	3.80	18.9	3.67E-04	1.028	3.77E-04	
12/09/10	19	4	60	0.35	24.62	3.80	18.9	3.67E-04	1.028	3.77E-04	*
12/09/10	19	5	60	0.35	24.62	3.80	18.9	3.67E-04	1.028	3.77E-04	*
12/09/10	19	6	60	0.35	24.62	3.80	18.9	3.67E-04	1.028	3.77E-04	*
12/09/10	19	7	60	0.35	24.62	3.80	18.9	3.67E-04	1.028	3.77E-04	*

Reported Average Hydraulic Conductivity* 3.8E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION

NA

USCS (ASTM D2487;2488)

NA

REMARKS

Material passed 3/8" sieve used for testing. Material was remolded to 68.7 pcf of dry density (85.0% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	24/25
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	140			Pore Pressure Transducer ID #	28

TIMELY ENGINEERING SOIL TESTS, LLC

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

AASHTO R18

Tested By	RI
Date	12/08/10
Checked By	LK

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10894/PS-20	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 1140; Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve

NATURAL MOISTURE CONTENT

Mass of Wet Sample & Tare, g	359.80
Mass of Dry Sample & Tare, g	261.60
Mass of Tare, g	70.60
Moisture Content, %	51.41

HYGROSCOPIC MOISTURE CONTENT

Mass of Wet Sample & Tare, g	
Mass of Dry Sample & Tare, g	
Mass of Tare, g	
Moisture Content, %	

SAMPLE DATA

Total mass of wet sample used for sieve analysis & tare, g	150.30
Mass of Tare, g	0.00
Total mass of dry sample used for sieve analysis, g	99.26

REMARKS

100% of total sample (18400 g) passed 3/4" sieve

SIEVE ANALYSIS

Mass of Tare, g	0
Mass of sample and tare retained on No. 200 sieve, g	2.2
Percent of sample retained on No. 200 sieve, %	2.22
Percent of material finer than No. 200 sieve, %	**97.78**

DESCRIPTION: NA

LL	
PL	
PI	

USCS (ASTM D2487; D2488): NA

NOTE: Method used for test:	B	Sieve No. 200 ID #	38/86
Length of Soaking Period:	Overnight	Sieve Shaker ID #	54/130

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AASHTO R18

Tested By	RI
Date	12/08/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10894/PS-20	Depth/Elev.	-
Location	-	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		0.0
Mass of Mat. Retained on No. 4 sieve, g		0.0
Mass of Mat. Retained on 3/8" sieve, g		0.0
Mass of Mat. Retained on 3/4" sieve, g		0.0

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

MOISTURE CONTENT

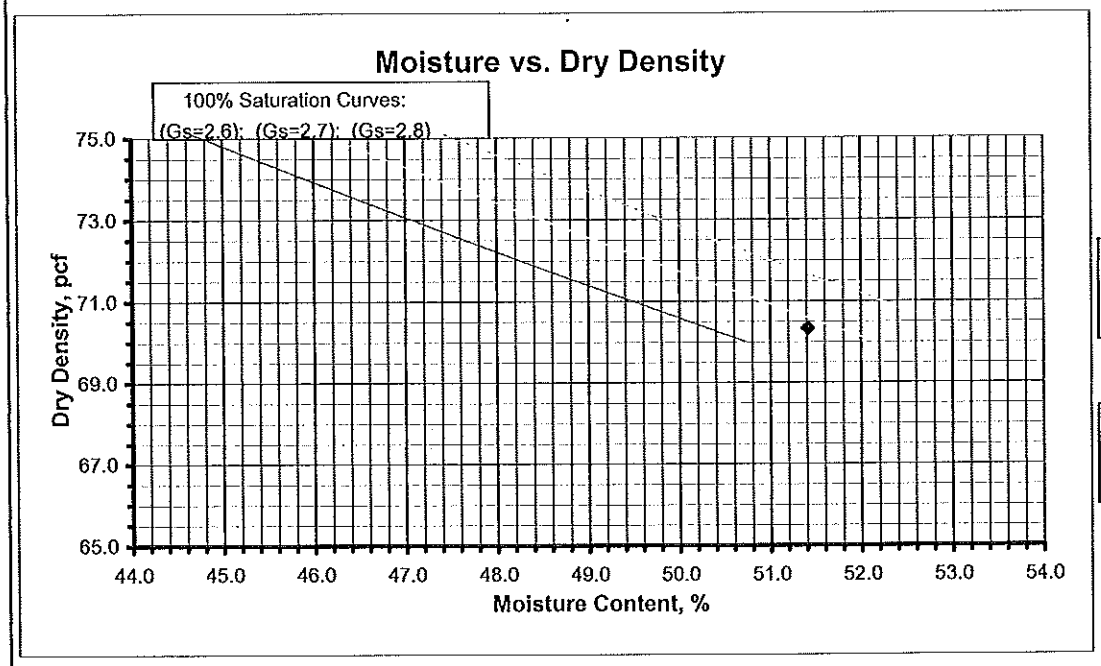
	Coarse + Fine Fraction	Coarse Fraction
Mass of Wet Sample & Tare, g	359.8	
Mass of Dry Sample & Tare, g	261.6	
Mass of Tare, g	70.6	
Moisture Content, %	51.4	

Procedure: B

TEST DATA

Points	1	2	3	4	5
Mass of Mold and Soil, g	5859.0				
Mass of Wet Sample & Tare, g	359.8				
Mass of Dry Sample & Tare, g	261.6				
Mass of Tare, g	70.6				
Moisture Content, %	51.4				
Wet Density, pcf	106.5				
Dry Density, pcf	70.3				

Mold ID Number	321B
Mass of Mold, g	4250.5
Volume of Mold, ft^3	0.0
Hammer ID Number	31
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		**Corrected Maximum Dry Density, pcf**	NA
Optimum Moisture Content, %		**Corrected Optimum Moisture Content, %**	NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Phone: 770-938-8233
Fax: 770-923-8973
Web: www.test-llc.com

AAP AASHTO R18

Tested By	VG
Date	12/09/10
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-8
Pr. Name	CMS Cell 2I	S. Type	Bulk
Sample ID	10894/PS-20	Depth/Elev.	-
Location	-	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	2.569	in	6.53	cm
Diameter	2.850	in	7.24	cm
Area	6.38	in^2	41.16	cm^2
Volume	268.56	cm^3	0.0095	ft^3
Mass	389.80	g	0.86	lb
Specific Gravity	2.700	(Assumed)		
Dry Density	59.8	pcf		

Moisture Content

Mass of wet sample & tare	359.80	g
Mass of dry sample & tare	261.60	g
Mass of tare	70.60	g
% Moisture	51.4	

Test Data

Speed	2	
Board Number	12	
Cell Number	23	
Flow Pump Number	1B	
Flow Pump Rate	5.73E-02	cm^3/sec
B - Value	0.95	
Cell Pressure	90.0	psi
Back Pressure	80.0	psi
Confining (Effective) Pressure	10.0	psi
Max Head	22.51	cm
Min Head	22.51	cm
Maximum Gradient	3.44	
Minimum Gradient	3.44	

Final Data (After Test)

Average Height of Sample			2.577	in	6.55	cm
Average Diameter of Sample			2.857	in	7.26	cm
Area	6.41	in^2	41.36	cm^2		
Volume	270.72	cm^3	0.0096	ft^3		
Mass	429.20	g	0.95	lb		

Dry Density	59.5	pcf
Vol. of Voids	175.15	cm^3
Vol. of Solids	95.57	cm^3
Void Ratio	1.83	
Saturation	97.7	%

Moisture Content

Mass of wet sample & tare	500.50	g
Mass of dry sample & tare	329.50	g
Mass of tare	71.70	g
% Moisture	66.3	

TIME FUNCTION			Δ t	READING	Head	Gradient	Temp.	PERMEABILITY (cm/sec)			
DATE	HOUR	MIN	(sec)	(psi)	(cm)		T_x(°C)	@ T_x	R_T	@ 20 °C	
12/19/10	19	1	-	0.32	22.51	3.44	19.9	-	-	-	
12/19/10	19	2	60	0.32	22.51	3.44	19.9	4.03E-04	1.003	4.04E-04	
12/19/10	19	3	60	0.32	22.51	3.44	19.9	4.03E-04	1.003	4.04E-04	
12/19/10	19	4	60	0.32	22.51	3.44	19.9	4.03E-04	1.003	4.04E-04	*
12/19/10	19	5	60	0.32	22.51	3.44	19.9	4.03E-04	1.003	4.04E-04	*
12/19/10	19	6	60	0.32	22.51	3.44	19.9	4.03E-04	1.003	4.04E-04	*
12/19/10	19	7	60	0.32	22.51	3.44	19.9	4.03E-04	1.003	4.04E-04	*

Reported Average Hydraulic Conductivity* 4.0E-04 cm/sec

Note: Deaired Water Used for Permeability Test.

DESCRIPTION: NA

USCS (ASTM D2487;2488): NA

REMARKS: Material passed 3/8" sieve used for testing. Material was remolded to 59.8 pcf of dry density (85.1% of one point standard proctor) at as recieved moisture content.

Flow pump ID #	22	Balance ID #	1/6/7	Differential Pressure Transducer ID #	70/68
Thermometer ID #	63	Oven ID #	14/15	Board Pressure Transducer ID #	216
Syringe ID #	141			Pore Pressure Transducer ID #	28

of NORTH CAROLINA, PLLC

APPENDIX T

Stone Laboratory Test Results

TIMELY ENGINEERING SOIL TESTS, LLC

574 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 (Rock-Samples)

Project Number: 1008-16

Project Name: CMS Landfill Cell 2 I

T.E.S.T. Sample Number	Client Sample Number	USCS	Carbonate Content (%)	Grain Size Distribution			Atterberg Limits			Proctor		Hydraulic Conductivity		
				%Finer #4 Sieve	% Finer #200 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
10969	Rock-1	-	1.5	2.5*	-	-	-	-	-	-	-	1.4	89.4	2.1E-01

Note *=Material is conforming to # 57 Stone Specifications

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	01/18/11
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-9
Pr. Name	CMS	S. Type	Bulk
Sample ID	10969/Rock-1	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D 3042

Standard Test Method for Insoluble Residue in Carbonate Aggregates

Determination of the Plus No. 200 Size Fraction of Insoluble Residue and Carbonate Content

Specimen Number	A	B
Dry Mass of Material (Plus No.200 sieve fraction) before Test & Tare, g	979.70	953.00
Dry Mass of Material (Plus No.200 sieve fraction) before Test, g	530.80	515.00
Dry Mass of Material (Plus No.200 sieve Insoluble Residue) after Test & Tare, g	971.50	945.00
Dry Mass of Material (Plus No.200 sieve Insoluble Residue) after Test, g	522.60	507.00
Mass of Tare, g	448.90	438.00
Insoluble Residue, %	98.46	98.45
Carbonate Content (Soluble fraction), %	1.54	1.55

Average Carbonate Content, % **1.5**

REMARKS

1. Solution of 6N HCl used for testing.
2. Material was heated for approximately 1 hour in order to completely react the carbonate fraction.
3. Material retained on No.200 sieve used for testing

DESCRIPTION

NA

USCS NA

AASHTO NA

TIMELY ENGINEERING SOIL TESTS, LLC

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Fax: 770-923-8973
Web: www.test-llc.com

AASHTO R18

STANDARD CLASSIFICATION (SPECIFICATION) for SIZES of AGGREGATES
ASTM D 448, C 136; AASHTO M 43, T 27

T.E.S.T. Laboratory Project No.: 1008-16-9

Project Name: CMS
Material: Aggregate
Size Number: 57
Testing Standard: ASTM C 136, D 448

Sample ID 10969/Rock-1

As-received sample size 27921.0 (grams)

Sampled by:
Date:

MOISTURE CONTENT DETERMINATION

Tare #
Tare weight (grams)
Wet test specimen weight + tare (grams)
Oven-dry test specimen weight + tare (grams)
Moisture loss (grams)
Moisture content NA %

Tested by: RI
Date: 1/18/2011
Checked by:

Dry Weight of Specimen for Sieve Analysis 27921.0 (grams)

SIEVE ANALYSIS

Sieve Size	Weight Retained, g.	Cumulative Weight Ret., g.	% Retained	% Passing	Specifications D 448, M 43
1.5-in.	0.0	0.0	0.0	100.0	100
1.0-in.	0.0	0.0	0.0	100.0	95-100
0.5-in.	17948.0	17948.0	64.3	35.7	25-60
No. 4	9278.0	27226.0	97.5	2.5	0-10
No. 8	518.0	27744.0	99.4	0.6	0-5
PAN	102.0	27886.0	99.9	0.1	

Comments: Entire sample was used for testing.

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	LB/RI
Date	01/18/11
Checked By	

Client Pr. #	-	Lab. PR. #	1008-16-9
Pr. Name	CMS	S. Type	Bulk
Sample ID	10969/Rock-1	Depth/Elev.	-
Location	-	Add. Info	-

ASTM D-2434/AASHTO T-215
Standard Test Method for Permeability of Granular Soils (Constant Head)

SAMPLE DATA

Height of Sample, cm	30.0
Diameter of Sample, cm	10.50
Mass of Sample and Apparatus, g	4619.0
Mass of Apparatus, g	846.0
Mass of Sample, g	3773.0
Initial Dry Density, pcf	89.4
Final Dry Density,pcf	89.4

MOISTURE CONTENT

Mass of Wet Sample & Tare, g	1111.10
Mass of Dry Sample & Tare, g	1098.60
Mass of Tare, g	228.60
Moisture Content, %	1.44

TEST DATA

-	Time of Discharge		Volume of Discharge, cm^3	Temperature (T_x), °C	Permeability at T_x, cm/sec	Correction Factor	Permeability at 20°C, cm/sec	
	min	sec						
1	5	0	2358	21.9	2.3E-01	0.958	2.2E-01	
2	5	0	2272	21.9	2.2E-01	0.958	2.1E-01	
3	5	0	2229	21.9	2.1E-01	0.958	2.1E-01	
4	5	0	2244	21.9	2.2E-01	0.958	2.1E-01	*
5	5	0	2230	21.9	2.1E-01	0.958	2.1E-01	*
6	5	0	2250	21.9	2.2E-01	0.958	2.1E-01	*
7	5	0	2245	21.9	2.2E-01	0.958	2.1E-01	*
8	5	0	2242	21.9	2.2E-01	0.958	2.1E-01	*

***Reported Permeability, cm/sec** **2.1E-01**

DESCRIPTION

NA

REMARKS

1) Sample was placed in permeameter in loose condition.

USCS (ASTM D2487; D2488)	NA
Apparatus ID Number	7
Timer ID Number	5
Thermometer ID Number	72

Final Height of Sample, cm	30.0
Head, cm	12.0
Gradient	0.40