

**APPROVED**

DIVISION OF WASTE MANAGEMENT

SOLID WASTE SECTION

DATE June 18, 2008 BY G. Mingtai Chao  
PTO for cell 12; DIN 4887



**BUNNELL-LAMMONS ENGINEERING, INC.**

GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

# CONSTRUCTION QUALITY ASSURANCE REPORT

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## CONSTRUCTION OF CELL NO. 12

### EAST CAROLINA REGIONAL MSW LANDFILL BERTIE COUNTY, NORTH CAROLINA

Prepared for:

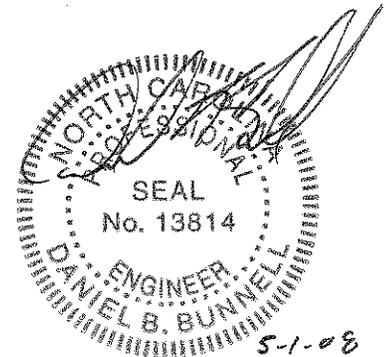
Hodges, Harbin, Newberry, & Tribble, Inc.  
Macon, Georgia

Prepared by:

Bunnell-Lammons Engineering, Inc.  
Greenville, South Carolina

April 29, 2008

BLE Project Number J07-1001-58



**PROTECTIVE COVER AS-BUILT SURVEY**

**FML AS-BUILT SURVEY**

**COMPACTED CLAY LINER AS-BUILT SURVEY**

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**  
**CONSULTING ENGINEERS**

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June 2, 2008

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DANIEL E. CHEEK, PE  
K. MATTHEW CHEEK, PE

Mr. Edward F. Mussler, III, P.E.  
NCDENR  
1646 Mail Service Center  
Raleigh, NC 27699-1646



**Re: East Carolina Regional Landfill  
Construction of Cell No. 12  
Bertie County, North Carolina  
Permit No. 08-03  
HHNT Project No. 6703-273-01**

Dear Mr. Mussler:

We have enclosed a response from Bunnell-Lammons Engineering, Inc. to your e-mail comments on the subject project CQA Report.

Should you have any questions, please call.

Sincerely,

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

William F. Hodges, P.E.  
Professional Engineer

WFH/rm

*Enclosure*

cc: Ray Hoffman, P.E., w/encl.  
Mitch Hoggard, w/encl.  
Dan Bunnell, P.E., w/o encl.  
Matt Cheek, P.E., w/o encl.

**PROJECT MEMO**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELLS NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

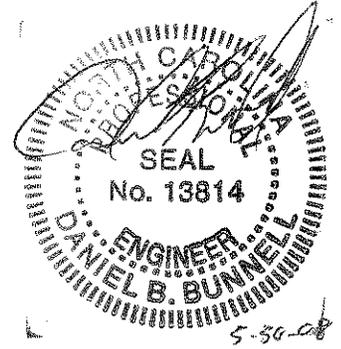
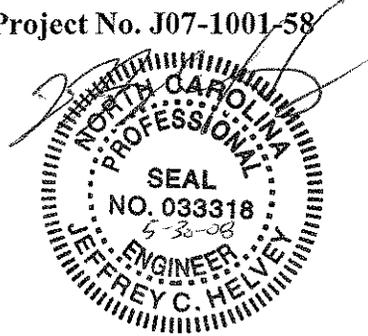
**BLE Project No. J07-1001-58**

To: Mr. Bill Hodges, P.E.

From: Mr. Dan Bunnell, P.E.  
Mr. Jeff Helvey, P.E.

Date: May 29, 2008

Subject: **Reply to Technical Review of CQA Report – Cell 12 Construction  
(Phase 4) by North Carolina DENR Dated May 28, 2008**



The purpose of this letter is to provide comments and clarifications to the document titled "Technical Review of CQA Report – Cell 12 Construction (Phase 4), East Carolina Regional MSW Landfill, Bertie County, North Carolina" dated May 28, 2008 prepared by Ming-Tai Chao of the NC DENR. The original NCDENR document is amended with our responses to each item. Our response comments are in *bold italic* type.

Technical Review of CQA Report – Cell 12 Construction (Phase 4)  
East Carolina Regional MSW Landfill  
Bertie County, North Carolina

Permit No. 08-03

Starting Date: 05/15/2008

Reviewed by: Ming-Tai Chao

Completion Date: 05/28/2008

**General**

Comment 1 (Table of Content): The page numbers of the subjects are not consistent with the ones in the report. Please make necessary correction.

*Response: These edits have been made to the CQA report and the corrected page is attached.*

**Section 3.1.4.3**

- 1) Comment 2 (page 8): According to the test results in Appendix D, the results of permeability of soil samples collected from the test pad are ranging from 1.9E-08 cm/s to 4.6E-08 cm/s, not 1.9E-08 cm/s to 5.1E-08 cm/s. Please clarify.

*Response: The reviewer was referencing the summary table for the Bulk Sample & Stockpile Testing report for Remolded Permeability Samples. The results reported for the test pad undisturbed permeability samples range from  $2.0 \times 10^{-8}$  cm/s (lowest/slowest value) to  $5.1 \times 10^{-8}$  cm/s (highest/fastest value) as noted in the table titled Summary of Clay Liner Hydraulic Conductivity Testing. The typographical edit ( $2.0$  rather than  $1.9 \times 10^{-8}$  cm/s) has been made to the CQA report and the revised report page is attached.*

**Section 3.1.4.4**

Comment 3: Several soil samples were failed to meet the field density requirements and noted in Appendix E (see Comment 15); therefore, it is imperative to discuss in this Section how these grid areas (approximately 100-ft by 100-ft) were re-compacted and re-worked to achieve the compaction effort and density objective. Please revise this Section accordingly.

*Response: As noted in the report text, all areas which initially failed to meet the compaction criteria were recompacted using sheepsfoot and smooth drum rollers and ultimately met or exceeded the project requirements. A summary of the initially failing and ultimately passing density tests is provided in the Appendix E. In order to provide more clarity for the reviewer, this additional information has been included in the CQA report and the added page provided. Density test results are uniformly reported to the nearest whole percent using proper rounding procedures.*

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**Section 3.1.5**

- 2) Comment 4 (page 10, the fourth paragraph): The pre-deployment meeting minutes are presented in Appendix B, and not in Appendix G. Please correct this typo.

*Response: This typographical edit has been made to the CQA report and the revised report page is attached.*

**Section 3.1.6**

Comment 5 (page 13): There are discrepancies of (1) the number of samples of washed sand

*Response: The text indicates that conformance testing included 5 grain size (ASTM D 422) and 3 hydraulic conductivity (permeability) tests (ASTM D 2434). In order to provide more clarity for the reviewer, we have changed the word “included” to “required”. This edit has been made to the CQA report and the revised report page is attached.*

*While only 5 grain size and 3 permeability tests were required, a total of 8 grain size and 9 permeability tests were performed, exceeding the project requirements.*

*[Comment 5 continued]* and (2) data ranges of permeability values of native sand between Appendix D and this Section. Please clarify.

*Response: The results reported for the native sand permeability samples range from  $2.1 \times 10^{-3}$  cm/s (lowest/slowest value) to  $1.5 \times 10^{-2}$  cm/s (highest/fastest value) and are correctly stated in the report text and summary table. No change is required.*

Comment 6: The quantities of washed sand and native sandy soil used for constructing protective cover need be provided in the CQA report, so that whether or not the corrected number of CQA tests performed, in accordance with the Specification, can be confirmed.

*Response: The quantity of native sand was stated on the testing summary table. The requested additions have been made to the CQA report text and the revised report page is attached.*

**Appendix A**

Comment 7 (Figure 3 - Subgrade As-Built Survey): The subgrade slopes, drain transverse (north/south direction) flow to trunk line (east/west direction), on the as-

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Completion Date: 05/28/2008

built figure were spot checked, and slope values of less than two (2) percent [refer to Rule .16249b)(7)] were found. Please clarify.

**Response:** *The as-built survey for the clay liner subgrade indicates all elevations are at or below design subgrade elevations, as desired. Slopes of the clay liner subgrade are not critical and therefore are not specified, but they do reflect the clay liner surface grades and slope to the leachate pipe locations at approximately 2%.*

Comment 8 (Figure 3 – Compacted Clay Liner (CCL) As-Built Survey): The base slopes of CCL on the as-built figure (several less than 2 percent in north/south direction) were less than those on the Sheet 3 of 8 in the “Specification and Construction Documents (**the Specification**).” Please clarify.

**Response:** *Drainage occurs along a path perpendicular to the maximum slope and not in a north/south direction. The minimum base slopes along the drainage path indicated on the top of clay as-built survey was measured to be greater than or equal to the required 2%.*

Comment 9 (Figure 3 – Protective Cover As-Built Survey): The slope of the in-place HDPE leachate piping - L4 is 1.23% which is less than the designed value of 1.4% as shown on the Sheet 4 of 8 in the “Specification.” Please clarify. Additionally, the elevation data of the protective cover at a point (on the west side, near edge of the cell, and upgradient point of the first transverse rib line) is missing. Please provide the survey data.

**Response:** *Leachate line L-4 lies on a layer of cushion geotextile which overlies the geomembrane. The grades in this area, therefore, follow the top of clay liner and not the grades for the top of protective cover / leachate collection system shown on the Protective Cover As-built. The project documents Sheet 4 of 8 dated September 2007 and revised November 20, 2007, indicate the minimum design grade for leachate pipe L4 is 0.7% (not 1.4%). The as built grade for L-4 is 0.8%.*

*The missing data point noted by the reviewer is in the temporary storm water drainage channel at a rain flap location. Protective cover will not be placed here until the associated subcell is put into service.*

Comment 10 (Figure 3 – FML As-Built Survey): The following sample locations can not be found on the as-built figure, please add these location to the figure.

- 3) The destructive sample location, Ds-67 and repair sample location, R519 at the intersection of panels C-11 and S-88.

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**Response:** *Repair 519 and DS-67 are in the same location and have been added to the FML as-built. A revised copy of the FML as-built is attached.*

**Appendix D**

Comment 11: The hydraulic conductivity (K) of sample LP-1-9 is 1.3E-07 cm/sec, under confine pressure 75 psi, which is fail to meet the required  $K=1.0E-07$  cm/sec. The second test on sample LP-1-9A has  $K=2.9E-08$  which is passing the hydraulic conductivity criterion for compacted clay liner; however, the confine pressure exerted on the second sample LP-1-9A was increased to 85 psi. Please explain:

- 1) What is the logical reason to increase the confine pressure to 85 psi from 75 psi (the constant confine pressure was used on most samples)? If the estimated overburden pressure determines selection of a confining pressure for a sample, the higher pressure shall be reasonable selected for the samples in the first lift. However, the different confining pressures (85 or 75 psi) were likely randomly applied on samples located in different grids and lifts throughout the testing. Please clarify.

**Response:** *“Confining Pressure” should not be confused with “Effective Confining Pressure” / “Effective Stress”. The Effective Stress on both samples was 15 psi as desired. The effective stress is equal to the “confining pressure” minus the “inflow pressure” (pore pressure). The noted variations of the confining pressure are used to aid in saturation of the sample and have no influence on sample consolidation and do not result in varying permeability test results for the same material.*

- 2) Why did the procedures to handle the fail testing result stated in the **Specification** (page 7, Item G. h. of II. Compacted Clay Liner) not implemented at that time?

**Response:** *Damage to the LP-1-9 sample occurred during set-up in the laboratory – a laboratory error. The test sample was replaced with sample LP-1-9A obtained 6 inches from the damaged sample. LP-1-9A represents the in-place clay, meets the project permeability criteria and has been designated sample LP-1-9 to replace the damaged sample.*

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 Completion Date: 05/28/2008

Comment 12: There are discrepancies of sample IDs and sample locations of LP-1-1, LP-2-1, LP-3-1, & LP-4-1 (refer to Pages 43 of 138, 60 of 138, 76 of 138, and 90 of 138) of Test Reports in Appendix D and summary tables in Appendices D and J. Please clarify.

**Response:** *Sample ID's "LP" for the test pad samples should have been identified as "TPLP". The text and tables have been revised to show the undisturbed permeability test pad samples identified as "TPLP" in all locations. The revised report pages are attached. There are no discrepancies between summary table test locations.*

**Appendix E**

Comment 13: The discrepancies of grid numbers were found in Tables as shown below:

Test No./Table	Table - Field Density Grid Map Checklist	Table - Field Density Test Results for Drive Tube
CLD-39	GRID 37	GRID 57
CLD-171	GRID 60	GRID 66
CLD-181	GRID 6	GRID 3
CLD-218	GRID 62	GRID 46

Please clarify.

**Response:** *The "Table – Field Density Grid Map Checklist" correctly shows the grid numbers. The "Table – Field Density Test Results for Drive Tube [and/or Nuclear Gauge]" has been corrected. These typographical edits have been made to the CQA report and the revised report page is attached.*

Comment 14: Typo on page 118 of 123. Test No CLD-225 [~~CLD-255~~] was at the same location of LP-3-15, not L-3-15. Please make necessary correction.

**Response:** *L-3-5 was corrected to be LP-3-5. This typographical edit has been made to the CQA report and the revised report page is attached.*

Comment 15: The samples that were collected from CCL and failed the field density test are listed below:

Sample	Dry Density (pcf)	95% Max. Dry Density (pcf)
CLD-33	100.3	100.415
CLD-95	100.2	100.415
CLD-112	100.2	100.415
CLD-118	100.2	100.415
CLD-119	100.4	100.415

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CLD-120	100.3	100.415
CLD-122	100.2	100.415
CLD-123	100.2	100.415
CLD-183	100.2	100.415
CLD-199	99.7	100.415
CLD-204	97.6	100.415
CLD-209	98.5	100.415
CLD-234	100.2	100.415

According to Item G of Part 3 of the Specification Section 02250 –Compacted Clay Liner (CCL), CCL density that is less than 95 percent of the maximum dry density determined from the Standard Proctor test shall be re-compacted and/or removed and reworked to meet density objectives. However, above-referenced soil samples that were field tested by a nuclear gauge having dry density results less than 95 percent of the maximum dry density; but no further actions were addressed or taken (no re-testing results are available, and no description of how the unacceptable CCLs were handled in the field [refer to Section II. G. h of CQA manual]). Please clarify.

**Response:** *As noted in the reviewer’s comments, the project documents require “95%” compaction. All density tests were reported to the nearest whole percent using proper rounding procedures. Use of more significant figures is not warranted. CLD-33, 95, 112, 118, 119, 120, 122, 123, 183, and 234 therefore, meet the required 95% compaction. As noted in the test results, CLD-199, 204, and 209 meet the required 95% compaction; however, a typographical error references the incorrect standard Proctor maximum dry density. These typographical edits have been made to the CQA report and the revised report pages are attached.*

Comment 16: Typographic errors. Some subgrade samples are passing the field density criterion but noted as “F” for failing test; they are SFD-81, SFD-83, SFD-85, SFD-86, &SDF-141. However, one sample SFD-142 did fail the density but no further action and re-test were reported in the CQA report. Please clarify.

**Response:** *These tests indicate that the tested soils meet the project percent density compaction criterion. However, these soils failed to meet moisture content criterion established by the engineer for these particular soils (too wet). As a result, the soils were allowed to dry and were retested after additional compactive effort was applied. In order to provide more clarity for the reviewer, this additional information has been included in Summary of Field Density Retests, Structural Fill, and is attached.*

Technical Review of CQA Report – Cell 12 Construction (Phase 4)  
East Carolina Regional MSW Landfill  
Bertie County, North Carolina

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**Appendix G**

Comment 17: In the Panel Identification and Placement (sheet 2 of 3, dated 3/13/2008) the number of “cumulative panel area of 90,363 square feet is incorrect, which shall be 90,318 ft<sup>2</sup>. This mistake was carried over the rest of sheets. Please make corrections.

***Response: These typographical edits have been made to the CQA report and the revised corresponding pages are attached.***

Comment 18: The Panel Identification and Placement for the date 3/22/2008 was an incomplete one, without providing data of each panel length and area. Please make necessary revision.

***Response: These typographical edits have been made to the CQA report and the revised corresponding pages are attached.***

Comment 19: The Specification Part 2.03 in Section 02745-5 required gate valves (ASAHI Type O or equal) to be used in the leachate piping system. No manufacturer/contractor submittal of the gate valve is available in Appendix G. Please clarify.

***Response: No gate valves were used in the construction of Cell No. 12. The gate valve noted for Leachate Manhole No. 11 was installed as part of Cell No. 11 construction.***

Comment 20: The manufacturer’s 20-yr warranty for FML (refer to Section 02750-3) is not included in Appendix G. Please provide the warranty document.

***Response: This additional information will be provided.***

Comment 21: Two panels on the south side of FML panels S-21 & S-22 did not assigned identifications, and no documentations of test seam or field seam data associated with two panels. The similar situation was observed on the north side of panel S-33. Please clarify.

***Response: No additional panels exist. The lines shown on the FML as-built drawing are repairs that cross these panels (S-21 and S-22,) as noted in the repair log.***

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 East Carolina Regional MSW Landfill  
 Bertie County, North Carolina

Permit No. 08-03

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Completion Date: 05/28/2008

Comment 22: In Table 5- Panel Repair, the repair sample ID at the intersection of panels S-66 & S-68 for destructive sample No. DS-63 shall be R232, not R-234. Please make necessary correction.

**Response:** *Table 6 (QC Destructive Sample Testing) was corrected to match Table 7 (CQA Destructive Sample Testing), Table 5, and the FML as-built. This typographical edit has been made to the CQA report and the revised corresponding page is attached.*

Comment 23: Discrepancies were found between Table 7- QA Destructive Seam Strength Testing and as-built figure (Figure 3 - FML As-Built Survey); which are described below:

Sample	Panels shown in Table 7	Panels shown on as-built figure
DS-8	P18/P12	S-18/S-17
DS-20	P34/P35	S-34/S-36
DS-39	P44/P45	S-44/T-45
DS-65	T86/T87	T-86/T-91

Additionally, throughout the report, the panel IDs were assigned in the nomenclature either S-XX or T-XX. For the sake of consistency, please change all panel IDS from P-XX to S-XX in Table 7.

**Response:** *These typographical edits have been made to the CQA report and Table 7 revised as noted. The corresponding revised report pages are attached.*

**Appendix J (CQA Summary Tables)**

Comment 24: There are discrepancy of values (see Table below) of maximum dry density and optimum water content for sample SF-3-C11 in Table of “Summary of Protectors – Structural Fill (Appendices B & J)” and in Table of “Field Density Test Result for Drive Tube (Appendix E).” Please clarify.

Summary of Protectors – Structural Fill (Appendices B & J)	
Maximum dry density (pcf)	Optimum water content (%)
107.3	17.8
Field Density Test Result for Drive Tube (Appendix E)	
Maximum dry density (pcf)	Optimum water content (%)
111.5	11.1

**Response:** *Proctor Number SF-3-C11 (107.3 pcf MDD and 17.8% OMC) was not used. SF-4-C11 was used (111.5 pcf MDD and 11.1% OMC) and is consistent with the MDD and OMC referenced in the testing*

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*documentation. The reference to SF-3-C11 was a typographical error. The corresponding revised report pages are attached.*

Comment 25: Typos –

(Table of “Summary of Design and Operation Plan - Smooth HDPE Geomembrane Test frequency Requirements”)

- The total weight of geomembrane, according to Poly-Flex material pr-certification list, is 181,296 pounds, not 177,772 pounds.

**Response:** *The total weight for the geomembrane reported by Poly-Flex is the total weight of the geomembrane including the roll core. The roll core is not part of the geomembrane and, therefore, was not used to calculate the geomembrane weight and the corresponding number of required tests. This weight is included by Poly-Flex for shipping/trucking restrictions and not for MQC purposes. The total weight reported by BLE is calculated by multiplying the average thickness of the roll by the width and length to determine a volume. The reported sheet density is then used to calculate the weight of the geomembrane manufactured for MQC test frequency purposes. Regardless, the variation does not alter the required number of MQC tests.*

- Testing method for thickness of smooth FML shall be ASTM D5199, not D5994.

**Response:** *These typographical edits have been made to the CQA report and the revised report pages are attached.*

- The number of CQC test of NCTL is 12, not 1.

**Response:** *The results of 12 tests were reported by the manufacturer but only one 1 was required. This typographical edit has been made to the CQA report and the revised report page is attached.*

(Table of “Summary of CQA Conformance Test Results HDPE Geomembrane”)

- Testing method for thickness of smooth FML shall be ASTM D5199, not D5994.

**Response:** *These typographical edits have been made to the CQA report and the revised report pages are attached.*

(Table of “Summary of CQA Conformance Test Results HDPE Geomembrane”)

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- Tensile strength of the sample HS2-6-07-6092-5 is 180 ppi at yield, not 190 ppi.

**Response:** *This typographical edit has been made to the CQA report and the revised report page is attached.*

- Sheet densities of the samples HS2-6-07-6112-5 and HS2-6-07-6116-5 are 0.948 g/cc, not 0.947 g/cc.

**Response:** *These typographical edits have been made to the CQA report and the revised report pages are attached.*



**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

April 29, 2008

Hodges, Harbin, Newberry & Tribble, Inc.  
484 Mulberry Street  
Suite 265  
Macon, Georgia 31201



Attention: Mr. William F. Hodges, P.E.

Subject: **Construction Quality Assurance Report  
East Carolina Regional MSW Landfill - Cell No. 12  
Bertie County, North Carolina  
BLE Project No. J07-1001-58**

Dear Mr. Hodges:

This Construction Quality Assurance (CQA) Report summarizes our observations and construction quality assurance test results, from the start of construction on November 11, 2007 through completion of the protective cover and leachate collection system on April 19, 2008 for the Cell No. 12 at the East Carolina Regional MSW Landfill. During this time, the subgrade preparation, compacted clay liner installation, HDPE geomembrane installation, and the protective cover/leachate collection system installation were completed for Cell No. 12.

Bunnell-Lammons Engineering, Inc. (BLE) has monitored and documented the Cell No. 12 construction tasks listed below to determine if the construction was performed in accordance with the project drawings, specifications, and conditions as approved by the North Carolina Department of Environment and Natural Resources (NCDENR), Solid Waste Section. The report will be presented in a single volume. The following construction tasks are documented.

- Structural fill placement
- Proofrolling and subgrade preparation
- Clay liner borrow evaluation
- Test pad construction
- Compacted clay liner placement
- Geomembrane (Flexible Membrane Liner, FML) installation
- Protective cover layer and leachate collection system construction.

The purpose of this document is to report construction observations and testing by BLE and provide the CQA report as required by Title 15A, NCAC Subchapter 13B Section .1624 of the North Carolina Solid Waste Management Rules and as outlined in the project specifications. To the best of our knowledge, deviations from the plans and specifications are not substantial and are indicated herein.

In our professional opinion, the structural fill placement, subgrade and clay liner construction, geomembrane installation, and protective cover/leachate collection system construction documented in this report were completed in accordance with the following:

- The Construction Plans and Technical Specifications
- The CQA Manual
- Requirements of NCDENR
- Acceptable engineering practices

This statement is based on the results of the observation and quality control/quality assurance procedures described in this report.

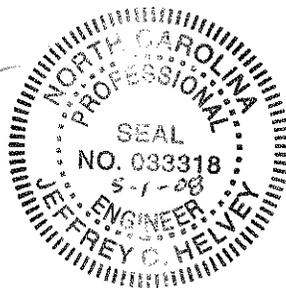
Please call us if you have questions concerning the attached report.

Sincerely,

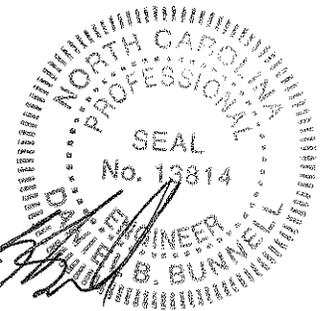
**BUNNELL-LAMMONS ENGINEERING, INC.**



Jeffrey C. Helvey, P.E.  
Project Engineer  
Registered, NC #33318



Daniel B. Bunnell, P.E.  
Principal  
Registered, NC #13814



5-1-08

Attachments

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**APPENDICES**

*REFER TO RESPECTIVE APPENDIX COVER SHEETS FOR LISTING OF CONTENTS*

**A FIGURES:**  
Vicinity Map, Site Location Map, Field Sketch, Subgrade As-Built Survey, Compacted Clay Liner As-Built Survey, Geomembrane As-Built Survey, Top of Protective Cover As-Built Survey

**NOTE:** Appendices B to I have been provided to the NCDENR in digital format (CD).  
Hard copies are provided for the on-site report copies.

**B RECORDS OF DAILY OBSERVATIONS**

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**D LABORATORY TEST RESULTS**  
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**F GEOMEMBRANE (Flexible Membrane Liner, FML)**  
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# Appendixes

## 1.0 PROJECT DESCRIPTION

The East Carolina Regional MSW Landfill is located in Bertie County, North Carolina. The project is described by the project drawings entitled "*Construction of Cell No. 12, East Carolina Regional MSW Landfill*", the technical specifications for construction of the project entitled "*Specifications and Contract Documents for Construction of Cell No. 12*" and the "*CQA Manual*", dated September 2007. The project documents were prepared by Hodges, Harbin, Newberry & Tribble, Inc. (HHNT). A Vicinity Map (Figure 1) and Site Location Plan (Figure 2) are presented in Appendix A of this report.

Cell No. 12 at the East Carolina Regional MSW Landfill is the tenth lined cell to be constructed at the site. Cell No. 12 will occupy approximately 15 acres (approximately 650,400 sq ft) and is positioned north of the existing Cell No. 11.

The structural components of the landfill cell include the following layers in order of increasing elevation (bottom to top):

- Prepared subgrade consisting of structural fill
- 24-inch thick low permeability ( $k \leq 1 \times 10^{-7}$  cm/s) compacted clay liner
- Textured (on slopes over 10 feet in height) & nontextured 60-mil HDPE geomembrane (FML)
- minimum 6-oz nonwoven geotextile (cell floor only)
- 24-inch thick protective cover/leachate collection system

The cell subgrade elevations in Cell No. 12 were achieved by structural fill placement. Earthwork grading to obtain the design subgrade elevations required structural fill up to 30 feet in height to form the access road at the east end of Cell No. 12. Low permeability, ( $k \leq 1 \times 10^{-7}$  cm/s) clayey soil was placed to backfill the existing storm water conveyance channel, which bisected the cell area prior to construction. The clay backfill was placed in accordance with the project clay liner construction requirements.

The base liner system consists of a 24-inch thick compacted clay liner (approximately 48,177 cy) having a permeability ( $k$ ) of less than or equal to  $1 \times 10^{-7}$  cm/s, overlain by a minimum 60-mil HDPE geomembrane (flexible membrane liner, FML). The clay liner borrow material was obtained from an on-site borrow site, the Tripp Property Borrow Area, located north of the cell. The borrow area had

been explored prior to the cell construction to determine the location of available structural fill, clay liner and native soil protective cover borrow soils. A clay liner test pad was constructed within the cell at the start of production clay liner construction.

The liner system described above is overlain by a 24-inch thick protective cover layer of native sand having a permeability of  $k \geq 1 \times 10^{-3}$  cm/s and, in the vicinity of the leachate sumps, washed sand having a permeability of  $k \geq 1 \times 10^{-2}$  cm/s. The native sand protective cover was obtained from the Tripp Property Borrow Area. The washed sand protective cover was hauled from the River Bend sand pit. A 6-oz nonwoven separation geotextile is provided between the HDPE geomembrane and the overlying protective cover over the cell floor. The leachate collection system consists of two longitudinal 8-inch diameter perforated SDR 11 HDPE pipes running in an east-west direction, each surrounded by ASTM No. 57 drainage stone and NC DOT No. 78M stone (transition or filter stone) and, underlain by a 24-oz cushion geotextile. Supplemental 4-inch diameter perforated HDPE lateral leachate collection pipes, wrapped in a 6-oz filter geotextile and connected to the 8-inch east-west pipes, were placed on a 50-foot center to center spacing perpendicular to the 8-inch pipes. The leachate collection system flows to two separate sump locations; Sump No. 12A in the west end and Sump No. 12B in the east end of the cell. Toe drains at the inside toe of the slopes in the west and east ends of the cell, consisting of an 8-inch diameter perforated HDPE pipe encased in a 10-foot wide zone of ASTM No. 57 aggregate wrapped in a 6-oz filter geotextile, drain to the sump location at each respective end. The toe drain stone is underlain with a minimum 24-oz cushion geotextile. The leachate sumps are composed of an area of graded aggregate surrounding dual 24-inch diameter HDPE riser pipes extending from an 8-foot square HDPE flat stock to the edge of cell.

The purpose of this document is to provide the CQA Report required by Title 15A, NCAC 13B, Section .1624 of the North Carolina Solid Waste Management Rules. This report documents the completed construction of Cell No. 12 as follows:

- Structural fill placement
- Proofrolling of the subgrade
- Compaction of subgrade soils
- Construction of the clay liner test pad
- Placement, compaction, and laboratory testing of the 24-inch thick compacted clay liner
- Installation of the 60-mil HDPE geomembrane ( Flexible Membrane Liner, FML)
- Construction of the protective cover and leachate collection system

## **2.0 SUMMARY OF QUALITY CONTROL/QUALITY ASSURANCE PARTIES**

The following parties were responsible for various aspects of quality control/quality assurance during the construction of this project.

### **2.1 REPUBLIC SERVICES OF NORTH CAROLINA, LLC**

Republic Services of North Carolina, LLC is the owner and operator of the East Carolina Regional MSW Landfill. East Carolina Regional MSW Landfill provided the following materials for the project: 60 mil minimum HDPE geomembrane (Flexible Membrane Liner, FML), geosynthetic clay liner (GCL) for use in the sumps, cell floor 6-0sy geotextile, and protective cover/leachate collection sand.

### **2.2 HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

Hodges, Harbin, Newberry & Tribble, Inc. (HHNT) of Macon, Georgia, is the Engineer of Record and Project Engineer for the East Carolina Regional MSW Landfill. HHNT prepared the project construction plans, specifications, and CQA Manual. Mr. William F. Hodges, P. E. of HHNT has observed the construction activities at critical phases of the construction.

### **2.3 WRIGHT AND FIELDS LAND SURVEYING, INC.**

Wright and Fields Land Surveying, Inc. of Troy, North Carolina, is the Surveyor of Record for the East Carolina Regional MSW Landfill Cell No. 12 construction.

### **2.4 R. B. BAKER CONSTRUCTION COMPANY, INC.**

R. B. Baker Construction Company, Inc. of Garden City, Georgia, is the general contractor for the construction phase of Cell No. 12. R. B. Baker Construction Company, Inc. (Baker) was responsible for the earthwork construction including the structural fill, clay liner and protective cover and leachate collection system elements of the Cell No. 12 and for the access road construction.

### **2.5 AMERICAN ENVIRONMENTAL GROUP, INC.**

American Environmental Group, Inc. (AEG) was contracted by Republic Services of North Carolina, LLC to install the minimum 60-mil HDPE geomembrane (Flexible Membrane Liner, FML) and 6-0sy geotextile layer over the cell floor. AEG performed the required construction quality control (CQC) testing for the geomembrane and installed the 6-0sy geotextile. The geomembrane was manufactured by Poly-Flex, Inc. of Grand Prairie, Texas. The 6-0sy geotextile was manufactured by Propex.

## **2.6 BUNNELL-LAMMONS ENGINEERING, INC.**

Bunnell-Lammons Engineering, Inc. (BLE) was retained by Republic Services of North Carolina, LLC to provide construction quality assurance (CQA) services as the Construction Quality Assurance Engineer (CQA Engineer) for the construction of Cell No. 12. The activities of BLE were directed by the Project Engineer, Hodges, Harbin, Newberry & Tribble, Inc. (HHNT) on behalf of the owner. BLE has, on a full-time basis, observed, tested, and documented the procedures, results, and related work used to install or construct each of the landfill components detailed in this CQA report. Responsibilities of BLE include providing field and laboratory quality assurance testing during construction of Cell No. 12. The fieldwork has been performed by senior engineering technicians under the direction of the CQA engineer, Mr. Daniel B. Bunnell, P.E., assisted by project engineer, Mr. Jeffrey C. Helvey, P.E.

## **3.0 CONSTRUCTION OBSERVATION AND TESTING**

Appendices B to I have been provided in electronic format (CD) accompanying this report volume. In addition, all data presented on CD has been provided in hard copy format to the landfill for their on-site records and the Facility Operating Record. Construction observations are contained in records of daily observations, which are presented in Appendix B. A series of color photographs of major project features is included in Appendix C. Laboratory test results for the soils from the subgrade, compacted clay liner, native sand and washed sand protective cover are provided in Appendix D. Field test results for the subgrade and compacted clay liner are provided in Appendix E. The Geomembrane conformance documentation is provided in Appendix F and the Geomembrane construction documentation is provided in Appendix G. Material submittals are provided in Appendix H. A report of geologic inspection of the cell subgrade is presented in Appendix I. Summary tables for the field and laboratory testing are included in each appendix and in summary in Appendix J at the end of this report. The general construction activities and phases observed and tested by BLE during landfill construction are as follows:

### **3.1 CELL NO. 12**

#### **3.1.1 Site Preparation**

Cell No. 12 was cleared, grubbed, and stripped of the vegetative cover and topsoil. The vegetation and topsoil were removed to areas well outside the planned cell construction area. The stripped ground surface (subgrade) of the Cell 12 was observed by the CQA Engineering Technician, Geotechnical Engineer and a Geologist familiar with the site subsurface conditions as described in

the *Design Hydrogeologic Report Phase 4 (Cells 11-12) East Carolina Regional MSW Landfill, Bertie County, North Carolina*, dated January 7, 2005 (revised June 3, 2005), BLE Project Number J04-1001-46. The site observations confirmed that the surface soils consisted of firm Layer 1 clay soils suitable for placement of the planned compacted clay liner or structural fill. A report of Geologic Observation of Cell No. 12 is provided in Appendix I.

### **3.1.2 Proofrolling**

Following site stripping, areas to receive structural fill were proofrolled using a loaded articulated dump truck. The proofrolling was monitored on a continuous basis by the CQA engineering technician, under the direction of the certifying engineer, Mr. Dan Bunnell, P.E. Unsuitable surface soils found in shallow, small, isolated areas of the cell were excavated and removed from Cell No. 12 to expose firm soils. The remaining areas of the subgrade proofrolled successfully.

### **3.1.3 Structural Fill**

Structural fill material was placed in the entire cell footprint to achieve the design subgrade elevations of the compacted clay liner in Cell No. 12. The placement of structural fill was conducted in accordance with the project technical specifications. The Subgrade As-built drawing, prepared by the project surveyor, Wright and Fields Land Surveying, Inc. is presented in Appendix A. The eastern embankment and access road required up to a maximum of approximately 30 feet of fill. On-site soils, primarily from the Tripp Property Borrow Area supplemented by soils obtained from on-site Borrow Area No. 9, were used as fill.

During structural fill placement, select clayey soils consistent with the soils used in the compacted clay liner were used to backfill the existing storm water conveyance channel, which bisected the cell. The clayey soil backfill was placed using equipment and methods in accordance with the project clay liner construction requirements described in section 3.1.4.4 of this report. The CQA Technician obtained in-place density tests and relatively undisturbed samples representative of the compacted clay backfill of the ditch. The test results are provided in Appendix D and E and indicate that the ditch backfill soils were placed at a density of at least 95% of the Standard Proctor maximum dry density and achieved a permeability of  $k \leq 1 \times 10^{-7}$  cm/s. After the ditch backfill was complete, subsequent structural fill was placed in approximately 10-inch thick (loose) lifts and compacted by sheepsfoot and smooth drum rollers. Standard Proctor (moisture-density, ASTM D 698) results representing the structural fill soils are presented in Appendix D. The structural fill soils consisted primarily of sandy silty clay (CH) and sandy clay (CL), and sandy silt / silty sand (ML/SM).

The CQA technician performed in-place (field) density tests on the compacted structural fill using the drive tube (ASTM D 2937) and nuclear (ASTM D 2922) methods. A field sketch used for

referencing density test locations is provided in Appendix A (Figure 3). The test locations are referenced to a series of grids representing areas measuring less than or equal to 10,000 sf to assist in achieving the specified in-place density test coverage. The results of the structural fill field density tests are presented in Appendix E. The test results indicate that the structural fill was placed in accordance with the project Technical Specifications and CQA Manual for compaction. All of the final in-place field density tests performed on completed structural fill indicated densities equal to or in excess of the minimum required 95% of the standard Proctor maximum dry density.

In summary, based on our full-time observation, field testing, laboratory testing, and provided as-built survey information, it is our professional opinion that the subgrade and structural fill for Cell No. 12 have been constructed in accordance with the project Plans and Specifications and the CQA Manual and are acceptable for support of the compacted clay liner.

### **3.1.4 Compacted Clay Liner**

#### **3.1.4.1 Conformance Testing**

An investigation of potential on-site clay liner borrow areas was performed prior to construction of Cell No. 12. The area investigated prior to this phase of construction was the Tripp Property Borrow Area located northeast of the Phase 1 and 2 areas of the landfill. The Tripp Property borrow area was selected as the soil borrow source for construction of the Cell No. 12 compacted clay liner as well as for structural fill and native sand protective cover. Data from the prior borrow studies as well as test pads and the constructed clay liners for Cells No. 3 through Cell No. 11 had shown that selected clayey soils typically found within the upper approximately 15 feet at the site, (designated Layer I Soils), will achieve the required clay liner permeability. Testing of selected Layer I clayey soils from the Tripp Property yielded remolded permeability values of  $k \leq 1 \times 10^{-7}$  cm/s. The clay permeability data available from the prior site construction and borrow studies were used in the development of the Cell No. 12 clay liner compaction criteria.

The test results of the conformance samples, presented in Appendix D of this report, confirm the clayey soils from the Tripp Property are similar to the soils previously used at the site from near-by on-site borrow areas and are acceptable for use as a compacted clay liner.

Based on the results of the current and previous conformance testing, our recommended compaction criteria for Cell No. 12 was similar to that recommended for the construction of previous cells as follows:

<u>Material Description</u>	<u>Minimum % of Standard Proctor Max. Dry Density</u>	<u>% Wet of Optimum Moisture Content</u>
Layer I clayey soils (CL/CH)	95	minimum 2

### 3.1.4.2 Clay Liner Subgrade Preparation

The subgrade for the compacted clay liner consisted of structural fill. Field density tests were performed on the subgrade soils and all test results achieved the required compaction of 95% of the standard Proctor maximum dry density. The test results are presented in Appendix E. A summary table of field density test results and locations referenced to the field sketch grids on the subgrade is presented in Appendix J. A subgrade as-built drawing is included in Appendix A.

### 3.1.4.3 Clay Liner Test Pad Construction

Clay liner test pad construction permitted the CQA personnel to observe the construction means and methods proposed by the contractor. The performance of the test pad was evaluated by the CQA engineer and the monitoring and testing was performed by the CQA technician under the direction of the CQA engineer.

The subgrade of the test pad area was initially proofrolled and then compacted as described in Section 3.1.4.2 of this report. The subgrade surface was lightly scarified prior to placement of the initial lift of clay. The test pad soils were obtained from the Tripp Property Borrow Area and hauled to the test pad area with articulated off road haul trucks. Each of the four lifts of the test pad was constructed at the outset of each lift of the production clay liner. Each lift was constructed by initially spreading an approximate loose lift thickness of 8 to 10 total inches. The generally uniform loose lift thickness was achieved using a bulldozer and then disced with multiple passes with a disc harrow. Moisture modification was performed by discing with multiple passes with a disc harrow after adding water using a water truck. Each completed 8 to 10 inch loose lift of the test pad was then compacted with several overlapping passes of the Caterpillar 815 sheepsfoot compactor, followed by multiple passes with a vibratory smooth drum roller. The resulting compaction of the lift provided a 6-inch compacted lift thickness. Prior to placing the second, third and fourth lifts, the surface of the previous lift was scarified to promote bonding of the layers of the clay liner.

Based on a review of the permeability test of the remolded samples obtained from exploration of the Tripp Property borrow area as well as our experience on the site, a minimum density of 95% of the standard Proctor (ASTM D 698) maximum dry density, at a moisture content of 2% or more wetter than the Standard Proctor optimum moisture content, was selected for compaction of the test pad.

Following processing and compaction of each lift of the test pad, in-place density tests were performed using the nuclear method (ASTM D 2922). A bulk sample of the soil from each lift was obtained for laboratory Proctor compaction testing (ASTM D 698). Undisturbed Shelby tube type samples were obtained from each of the four lifts for laboratory permeability testing.

Laboratory hydraulic conductivity (permeability) tests (ASTM D 5084) were performed on the undisturbed samples obtained from the test pad. Test results ranged from  $k = 2.0 \times 10^{-8}$  to  $5.1 \times 10^{-8}$  cm/s. The performance of the test pad confirmed the preliminary compaction moisture-density criteria.

In summary, the selected clay liner borrow soil from the Tripp Property borrow area was found to be acceptable for construction of the compacted clay liner at the target criteria. Following successful performance of the test pad, the clay liner test pad soils were incorporated into the completed compacted clay liner.

#### **3.1.4.4 Clay Liner Construction**

R. B. Baker placed four nominal 6-inch thick (compacted) lifts of the selected Layer I soils from the Tripp Property borrow area as the compacted clay liner to achieve the required minimum 24 inch clay liner thickness and top of clay elevations for Cell No. 12. Placement of the compacted clay liner was conducted in accordance with the project specifications and the Construction Quality Assurance Manual and the results of the test pad. Photographs of the compacted clay liner in Cell No. 12 are included in Appendix C. A Clay Liner As-built Drawing is presented in Appendix A.

The CQA field personnel monitored the borrow soil excavation and identified soils acceptable for use consistent with the earlier borrow study and test pad construction. The material was initially spread by bulldozers, processed with a disc harrow and compacted by a CAT 815 sheepsfoot compactor. The surface of the clay was compacted and sealed using a vibratory smooth drum roller at the end of each day and prior to rain events to protect the layer from wetting, erosion, and desiccation. Lifts No 1, 2 and 3 were scarified prior to placement of the overlying lift. Lift No. 4 was completed by smooth rolling prior to installing the geomembrane.

The CQA field personnel performed field density tests on the compacted clay liner using the nuclear method (ASTM D 2922). The field density test results are included in Appendix E. The field in-place density test results were compared to applicable values of the laboratory standard Proctor maximum dry density and optimum moisture content to determine the level of compaction achieved (as a percentage of the maximum dry density) and relative moisture content. The compaction criteria for the clay liner determined by the prior clay liner test pads and construction was a minimum of 95 percent of the standard Proctor (ASTM D 698) maximum dry density and 2% or more wetter than the standard Proctor maximum dry density. These criteria were confirmed during the permeability testing for the compacted clay liner borrow soils. All test results achieved the required compaction. The test results indicated that the compacted clay liner was placed in accordance with project requirements for compaction to achieve the required minimum permeability.

Undisturbed thin wall tube samples of the compacted soil liner were obtained by on-site CQA personnel. All test holes were patched using a mixture of the clay liner soil and sodium bentonite pellets, compacted and hydrated in the holes. The thin wall tube samples were sent to the laboratory for permeability, density and moisture testing. The laboratory test results are presented in Appendix D and in a summary table at the end of this report. The laboratory test results indicated that the compacted clay liner achieved the specified hydraulic conductivity (coefficient of permeability,  $k \leq 1 \times 10^{-7}$  cm/s). The coefficient of permeability of the 64 undisturbed samples of the in-place compacted soil liner tested ranged from  $1.3 \times 10^{-8}$  cm/s to  $7.5 \times 10^{-8}$  cm/s.

In conclusion, based on the full-time observation, field testing, and laboratory testing by CQA on-site personnel under the direction of Bunnell-Lammons Engineering, Inc. and the provided as-built survey information by Wright and Fields Surveying verifying the minimum 24-inch thickness requirement, the compacted clay liner for Cell No. 12 has been constructed in accordance with the project Construction Plans and Technical Specifications, the CQA Manual, and the North Carolina Solid Waste Management Rules, and is acceptable for placement of the geomembrane.

### **3.1.5 Geomembrane (Flexible Membrane Liner, FML)**

Textured and Nontextured, minimum 60-mil, high density polyethylene (HDPE) liner, manufactured by Poly-Flex, were used for the geomembrane within Cell No. 12. A roll inventory and a Certificate of Quality Assurance for each of the 46 rolls of nontextured geomembrane and 16 rolls of textured geomembrane prepared by Poly-Flex are presented in Appendix G. A confirming inventory of each roll of HDPE, prepared by Precision Geosynthetic Laboratories, on behalf of BLE as a part of the CQA procedure, is also presented in Appendix G.

In accordance with the CQA Manual and project specifications, seven samples of the 60-mil HDPE geomembrane (number of samples equal to cube root of total number of textured and total number of nontextured rolls) were tested for laboratory materials CQA conformance testing. Sheet Density (ASTM D 1505), Melt Index (ASTM D 1238), Carbon Black Content (ASTM D 1603), Tensile Properties (ASTM D 638, GRI GM-13) and, Tear Resistance (ASTM D 1004, Die C) tests were performed. Each roll manufactured for Cell No. 12 was sampled and tested for thickness (ASTM D 5994 (textured) and ASTM D 5199 (nontextured)). The laboratory results for the test properties indicated that all of the 62 rolls of textured and nontextured 60-mil geomembrane meet the project requirements.

In addition to the original 62 rolls of liner manufactured for the project, 2 rolls of the Poly-Flex geomembrane manufactured for another, concurrent Republic Services of North Carolina project were shipped to the East Carolina project for use in the installation of the geomembrane liner. Additionally, one roll of Agru America textured geomembrane remaining on site from a previous Republic Services of North Carolina project was used in the base liner. These three rolls were sampled and tested as part of the Republic Services of North Carolina projects in accordance with the East Carolina Cell No. 12 project requirements. The three additional rolls of textured geomembrane meet the East Carolina Cell No. 12 project requirements.

Following review of the CQA and CQC test results, the 19 rolls of textured and 46 rolls of nontextured geomembrane were approved for use for Cell No. 12.

Installation of the geomembrane for Cell No. 12 began on March 10, 2008 and was completed on March 23, 2008. Construction quality assurance monitoring and testing were performed by BLE on a full-time basis. A pre-deployment meeting was conducted by the BLE project engineer, Mr. Jeff Helvey, P.E., prior to the beginning of geomembrane deployment. The pre-deployment meeting minutes are presented in Appendix B. Records of daily observations made by the CQA personnel during deployment and testing are presented in Appendix B. Photographs of the installation are presented in Appendix C.

American Environmental Group (AEG) installed the geomembrane. The surface of the clay liner was maintained with moisture application and smooth drum rolling by R. B. Baker. The finish surface was inspected and approved for geomembrane placement by BLE and AEG. AEG welded, sampled, patched, tested, and repaired the geomembrane. The panels of geomembrane were seamed using hot wedge double-track fusion welding. Fillet extrusion welding was used on seams not suited for hot wedge double-track fusion welding and to seam repair patches.

AEG performed nondestructive testing consisting of air pressure testing the entire length of each seam of the double track fusion weld channels and vacuum box testing of all fillet extrusion welds. AEG also performed the specified welder prequalification field destructive tests on coupons cut from test strips. The coupons were tested on-site using a tensiometer. BLE CQA personnel monitored and recorded the on-site CQC tests performed by AEG. Destructive seam samples were obtained a minimum average of every 500 linear feet of seam length, as specified by the project CQA Manual. The field destructive tests included both bonded seam shear strength and peel adhesion testing. The results of the CQC testing (Table 6) are included with the CQA test results (Table 7) presented in Appendix G. All of the geomembrane CQC field destructive tests achieved the specified minimum values.

As required by the project Technical Specifications and the CQA Manual, the geomembrane installer provided a portion of each destructive test sample to the CQA Engineer for testing. These samples were tested at a minimum average of every 500 linear feet of seam length, as measured by the CQA technicians. Bonded seam strength and peel adhesion tests (ASTM D 6392) were performed on each destructive sample by BLE, in accordance with the specified test methods. The geomembrane installer also provided a portion of each destructive test sample to the CQA Engineer for temporary archive storage at the Greenville, South Carolina office of BLE. The CQA destructive test results (Table 7) are included in Appendix G. The destructive test results indicated that the completed geomembrane field seams met the project specifications and CQA Manual requirements for bonded seam strength and peel adhesion.

The CQA personnel, under the direction of Dan Bunnell, P.E., observed the geomembrane subgrade (compacted clay liner) and monitored the deployment, welding, sampling, testing, patching, and repairs to the geomembrane on a full-time basis. The surface of the geomembrane was inspected for defects, excessive slack, and trampolining throughout each workday. Based on our full-time observation, the above components and tasks were deemed to be in conformance with the project specifications and CQA Manual. An as-built survey of the geomembrane panel layout, destructive test locations and repairs is provided in Appendix A. The CQA records of our monitoring of the geomembrane placement and testing are also included in Appendix G.

In conclusion, based on our full-time monitoring as well as the field and laboratory destructive test results and field nondestructive test results, the geomembrane was installed in accordance with the project specifications and the CQA Manual, and with Title 15A NCAC Subchapter 13B Section .1624 of the North Carolina Solid Waste Management Rules. The geomembrane is acceptable for placement of the protective soil cover and leachate collection system.

### **3.1.6 Protective Cover and Leachate Collection System**

The protective cover and leachate collection system installation began by placing a 6-oz nonwoven geotextile on the cell floor directly over the accepted HDPE geomembrane. The geotextile panels were joined by heat bonding prior to placing the overlying protective cover sand and leachate collection system components.

The leachate collection system consists of two longitudinal (East-West oriented) 8-inch diameter perforated SDR 11 HDPE pipes, surrounded by ASTM No. 57 drainage stone and NC DOT No. 78M stone (transition or filter stone) and, underlain by a 24-oz cushion geotextile. Supplemental 4-inch diameter perforated HDPE lateral leachate collection pipes, wrapped in a 6-oz filter geotextile and connected to 8-inch longitudinal pipes were placed on a 50-foot center to center spacing perpendicular to the 8-inch pipes. The leachate collection system flows to two separate sump locations; Sump No. 12A in the west end and Sump No. 12B in the east end of the cell. Toe drains at the inside toe of the slopes in the west and east ends of the cell consisting of an 8-inch diameter perforated HDPE pipe encased in a 10-foot wide zone of ASTM No. 57 aggregate, wrapped in a 6-oz filter geotextile, drain to the sump location at each respective end. The toe drain stone is underlain by a minimum 24-oz cushion geotextile. The leachate sumps are composed of an area of ASTM No. 57 aggregate surrounding dual 24-inch diameter HDPE riser pipes extending from an 8-foot square HDPE flat stock to the edge of cell. The couplings for the 8-inch diameter leachate line were made by welding except at temporary stormwater rainflaps where 10-inch diameter, 48-inch long slip joint couplings were used. The 10-inch diameter couplings were placed but not tack welded to the 8-inch collection pipe to allow for eventual coupling across the storm water flap.

The leachate system drains by gravity to the two sumps in Cell No. 12 and is then pumped by dual contained HDPE force main to the modified Leachate Manhole No 11 and into the existing leachate collection system.

A CQA technician observed the construction of the leachate collection system and the placement of the protective cover soil on a full-time basis. Daily reports of our observations are presented in Appendix B. A series of photographs that document the construction is also included in Appendix C.

The native sand protective cover was obtained from selected areas of the Tripp Property Borrow Area. The native sand protective cover borrow area was initially sampled and tested as part of a borrow exploration prior to the start of cell construction. Samples of the native sand were selected for permeability testing. The CQA personnel monitored the excavation and delivery of the sand

from the borrow area to the cell. Additional samples of the protective cover borrow sand were obtained from the borrow area during excavation and hauling to the cell for laboratory CQA conformance testing. The laboratory testing frequency of one permeability test per 3,000 cubic yards of protective cover sand was performed, as required by the project CQA Manual (42,100 cy, in place). The laboratory testing for the on site sand included 15 hydraulic conductivity (permeability) tests (ASTM D 2434). The permeability (k) values of the onsite sand used for the cell ranged from  $2.1 \times 10^{-3}$  cm/s to  $1.5 \times 10^{-2}$  cm/s, which met the specified permeability criteria of  $k \geq 1 \times 10^{-3}$  cm/s.

The washed sand protective cover was obtained from the nearby River Bend Sand Pit. The washed sand protective cover stockpile at the sand pit was sampled and tested as part of the required stockpile testing prior to being hauled to the site. Samples of the washed sand were selected for laboratory grain size and permeability testing. The CQA personnel monitored the delivery of the sand to the landfill. Additional samples of the washed sand protective cover were obtained from the on-site stockpile during hauling to the landfill for laboratory CQA conformance testing. The laboratory testing frequency of one grain size test per 1,500 cy and one permeability test per 3,000 cubic yards of protective cover sand were performed, as required by the project CQA Manual (6,100 cy, in place). The laboratory testing for the washed sand required 5 grain size (ASTM D 422) and 3 hydraulic conductivity (permeability) tests (ASTM D 2434). The permeability (k) values of the washed sand used for the cell ranged from  $2.5 \times 10^{-2}$  cm/s to  $5.6 \times 10^{-2}$  cm/s, which met the specified permeability criteria of  $k \geq 1 \times 10^{-2}$  cm/s.

The laboratory test results and a summary of permeability test results are presented in Appendix D of this report. The sands were classified as a light brown to yellow slightly silty to silty fine to medium sand. The sands were relatively free of nodules, refuse, roots, and other deleterious substances. In summary, the sand was found to be consistent in gradation, free of oversized rock, debris, or excessive fines, and was acceptable for use in the cell.

The leachate drainage stone materials (ASTM No. 57 & NC DOT No. 78M) were furnished by Wake Stone – Nash County Quarry. Gradations of both materials are presented in Appendix H. The materials meet the project requirements and were acceptable for use in the cell.

Product Certifications for the HDPE leachate collection pipe and the 6 and 24 osy nonwoven geotextiles used in the cell are included in Appendix H. The CQC laboratory testing and certifications provided for our review indicate values within the accepted range and are included in Appendix H. The materials were found to meet the project requirements and were accepted for use.

The protective cover sand placement began on March 24, 2008. The sand used to cover the cell floor was hauled by truck from the on-site borrow area to the cell on minimum 4 foot thick haul roads within the cell limits. The sand was spread across the cell using a CAT D6 low-ground-pressure bulldozer. During protective cover placement, the minimum 6-oz nonwoven geotextile and the geomembrane were monitored by the CQA technician for excessive slack, folds, and/or trampolining throughout the workday as it was covered. No distress to the geotextile or the underlying geomembrane was observed.

An as-built survey of the protective cover sand, prepared by Wright and Fields Land Surveying, Inc., is presented in Appendix A. A review of this as-built survey, as well as random depth checks and our full time construction monitoring, conclude that a minimum thickness of 2 feet of protective cover was placed everywhere within Cell No. 12.

Based on our full-time construction monitoring, performance of the CQA testing, the provided as-built survey information, and our review of the provided product certifications, the Cell No. 12 protective cover and leachate collection system components and construction were found to be in conformance with the Project Plans and Specifications and the CQA Manual.

In conclusion, the Cell No. 12 construction activities consisting of the:

- Structural fill placement
- Proofrolling and subgrade preparation
- Clay liner borrow evaluation
- Test pad construction
- Compacted clay liner placement
- Geomembrane (Flexible Membrane Liner, FML) installation
- Protective cover layer and leachate collection system construction

were completed in accordance with:

- The Construction Plans and Technical Specifications
- The CQA Manual
- The Permit
- Requirements of NC DENR
- Acceptable engineering practices

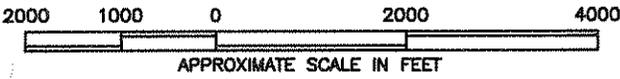
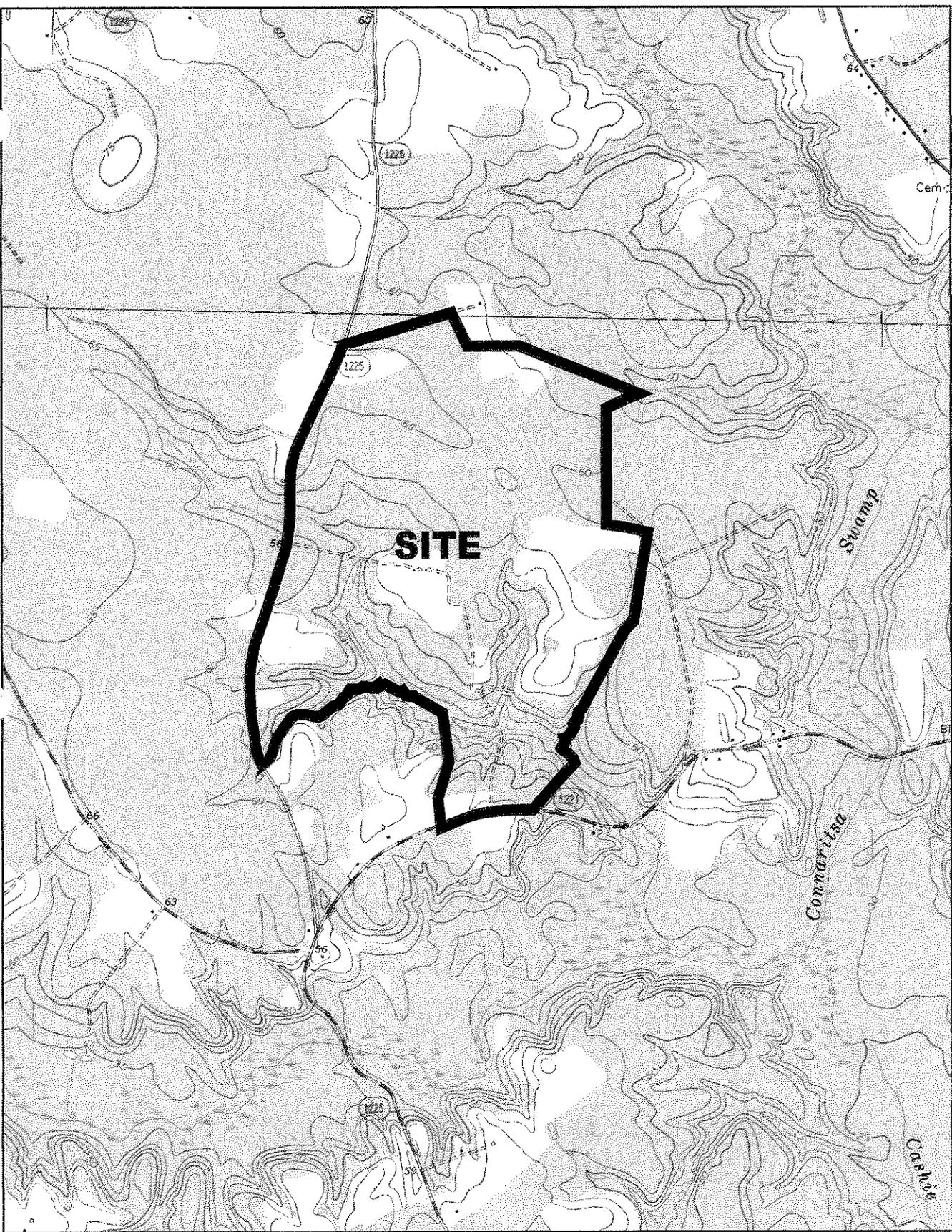
A

# **APPENDIX A**

## **FIGURES**

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	<b>FML AS-BUILT SURVEY</b>
	<b>PROTECTIVE COVER AS-BUILT SURVEY</b>



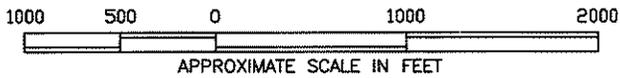
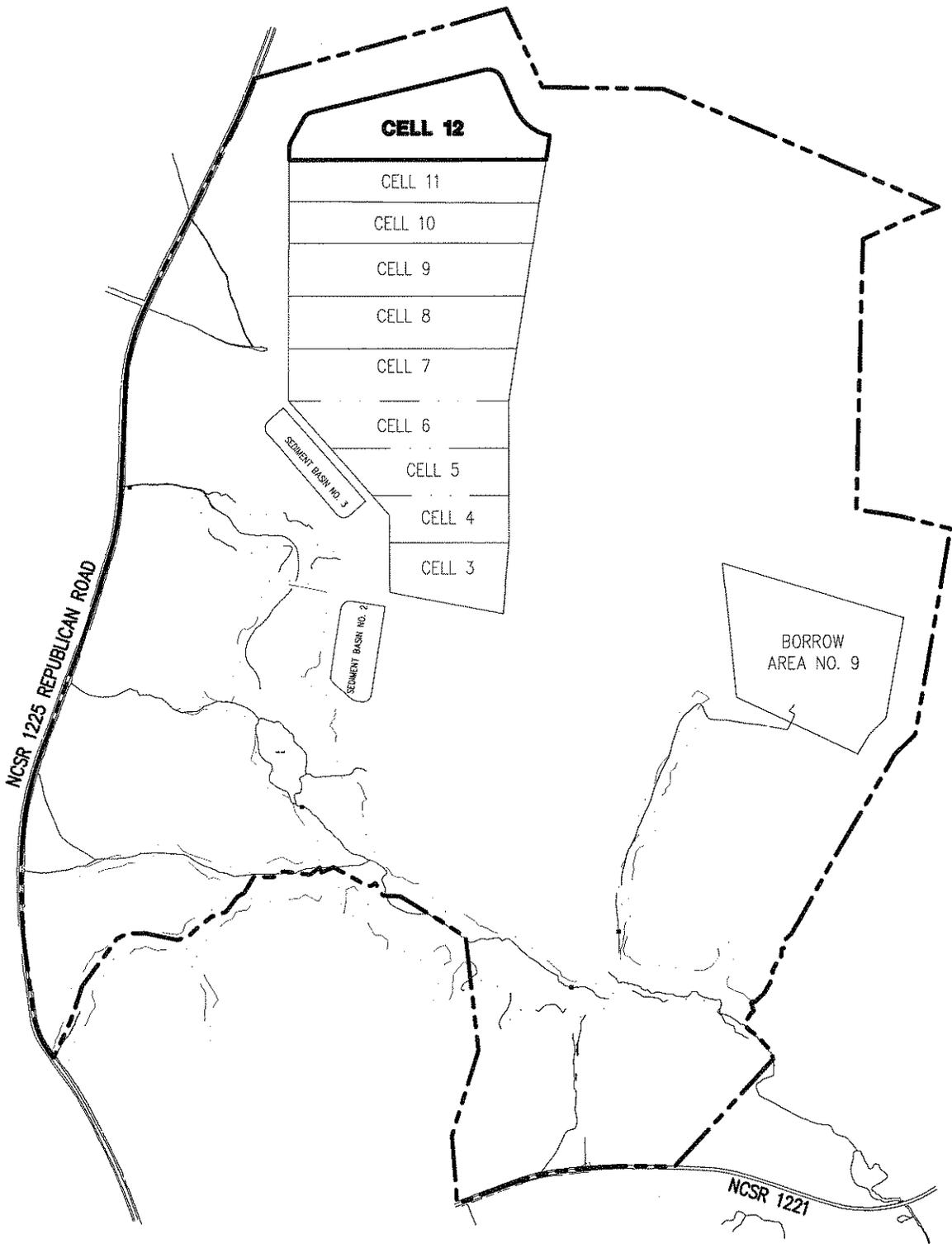
REFERENCE:  
 USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES,  
 AULANDER AND REPUBLICAN, N.C. QUADRANGLES, 1972 AND 1978.

DRAWN:	AEH	DATE:	04-29-08
CHECKED:	MSP	CAD:	ECLF57-SLM
APPROVED:		JOB NO:	J07-1001-58

**IBLE** INC.  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
 6004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1265 FAX: (864)288-4430

SITE LOCATION MAP  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**



REFERENCE:  
DRAWING TITLED "SURVEY AND BOUNDARY SURVEY, EAST CAROLINA LANDFILL", DATED NOVEMBER 1996, PREPARED BY HHNT.

DRAWN:	AEH	DATE:	04-30-08
CHECKED:	JCH	CAD:	ECLF58-C12SLM
APPROVED:		JOB NO:	J08-1001-58

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SITE LOCATION MAP  
 CELL NO. 12  
 EAST CAROLINA MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
2

**SUBGRADE AS-BUILT SURVEY**

**APPENDIX J**

**CQA SUMMARY TABLES**



**APPENDIX J**

**CQA SUMMARY TABLES**

**(REPLACE ENTIRE APPENDIX)**

**SUMMARY OF PROCTORS - STRUCTURAL FILL  
CONSTRUCTION OF CELL NO. 12**

**CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58**

SAMPLE DESIGNATION	STANDARD PROCTOR PARAMETERS (ASTM D 698)	
	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
SF-1-C11	114.5	14.5
SF-2-C11	108.7	17.3
SF-4-C11	111.5	11.1
P-4-4	104.9	19.5
TP-5-C9	99.2	21.5
CLSP-2-C12	105.7	18.0

**SUMMARY OF PROCTORS - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

**CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58**

SAMPLE DESIGNATION	STANDARD PROCTOR PARAMETERS (ASTM D 698)	
	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
TP-5	100.1	19.9
CLSP-2-C12	105.7	18.0
CLSP-3-C12	102.6	20.4

**SUMMARY OF CQA CONFORMANCE TESTING - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lanmons Engineering, Inc. Project No. J07-1001-59

Cell No. 12 = 651,000 sq ft ( 15 Acres) = 48,177 cy Clay Liner

TEST METHOD	REQUIRED FREQUENCY	REQUIRED NUMBER OF TESTS	NUMBER OF TESTS PERFORMED*
<b>FIELD TEST</b>			
DENSITY	ASTM D 2922 or D 2937 1/10,000sf/lift	272	272
MATERIAL GRAIN SIZE	< 3-INCH SIEVE FOR LOWER 18 INCHES (100% avg) < 1-INCH SIEVE FOR UPPER 6 INCHES (95% avg all tests & 100% avg 3-INCH SIEVE) 1/20,000sf/lift	136	136
<b>LABORATORY TEST</b>			
CLAY LINER STOCKPILE SAMPLES (BEFORE PLACEMENT)			
MOISTURE-DENSITY (PROCTOR)	ASTM D 698	5	5
REMOLDED PERMEABILITY	ASTM D 5084	5	5
GRAIN SIZE	ASTM D 422	1	1
MOISTURE CONTENT	ASTM D 2216	1	1
ATTERBERG LIMITS	ASTM D 4318	1	1
UNDISTURBED SAMPLES (DURING PLACEMENT):			
PERMEABILITY	ASTM D 5084	64	64
DRY DENSITY	ASTM D 2922	64	64
MOISTURE CONTENT	ASTM D 2216	64	64
BULK SAMPLES (DURING PLACEMENT):			
MOISTURE-DENSITY (PROCTOR)	ASTM D 698	8	8
GRAIN SIZE	ASTM D 422	8	8
MOISTURE CONTENT	ASTM D 2216	8	8
ATTERBERG LIMITS	ASTM D 4318	8	8

**SUMMARY OF CQA BORROW AND BULK SAMPLE CONFORMANCE TESTING - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Cell No. 12 = 651,000 sq ft (15 Acres) = 48,177 cy Clay Liner

	MATERIAL DESCRIPTION	PERCENT FINES (<#200 sieve)	ATTERBERG LIMITS			PROCTOR PARAMETERS			REMOULD PARAMETERS			REMOULDED HYDRAULIC CONDUCTIVITY (PERMEABILITY)  cm/s
			LIQUID LIMIT %	PLASTICITY INDEX %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	DRY DENSITY (% COMP.) %	MOISTURE CONTENT (% WET OF OPT.) %				
CLSP-1-C12	Light Brown & Grey fi Sandy CLAY	89.8	40.0	21.0	106.3	17.9	101.0 (95)	24.1 (6.2)	2.2E-08			
CLSP-2-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	105.7	18.0	101.0 (96)	23.0 (5.0)	2.7E-08			
CLSP-3-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	102.6	20.4	97.4 (95)	26.1 (5.7)	3.6E-08			
CLSP-4-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	103.8	19.0	99.1 (96)	25.0 (6.0)	5.0E-08			
CLSP-5-C12	Grey & brown fi-med. Sandy CLAY	---	---	---	105.6	17.1	101.0 (96)	24.0 (6.9)	4.8E-08			
LTP-1-1	Light Brown & Grey fi Sandy CLAY	80.8	43	23	110.9	16.2	106 (96)	20 (3.8)	1.9E-08			
L-1-2	Light Brown & Grey fi Sandy CLAY	87.0	42	24	103.6	18.8	---	---	---			
LTP-2-1	Light Brown & Grey fi Sandy CLAY	71.4	41	25	108.0	18.0	103.1 (96)	22.0 (4.0)	1.6E-08			
L-2-2	Light Brown & Grey fi Sandy CLAY	73.4	43	26	106.2	17.1	---	---	---			
LTP-3-1	Light Brown & Grey fi Sandy CLAY	75.9	44	26	104.4	14.3	100.0 (96)	22.0 (7.7)	4.1E-08			
L-3-2	Light Brown & Grey fi Sandy CLAY	82.8	45	27	104.6	18.5	---	---	---			
LTP-4-1	Light Brown & Grey fi Sandy CLAY	77.3	42	24	106.8	16.5	102.1 (96)	23 (6.5)	4.6E-08			
L-4-2	Light Brown & Grey fi Sandy CLAY	87.3	45	27	108.0	14.9	---	---	---			

# SUMMARY OF CLAY LINER HYDRAULIC CONDUCTIVITY TESTING

CONSTRUCTION OF CELL NO. 12  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA  
 BLE Project No. J07-1001-58

Cell No. 12 area = 667,000 sq ft (15.3 Acres) = 48,177 cy Clay Liner

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-1-1	1	CLD-2	22	4.6 E-08	PASS
LP-1-2	1	CLD-7	25	7.5 E-08	PASS
LP-1-3	1	CLD-10	13	4.1 E-08	PASS
LP-1-4	1	CLD-15	29	4.2 E-08	PASS
LP-1-5	1	CLD-20	5	3.6 E-08	PASS
LP-1-6	1	CLD-23	18	3.9 E-08	PASS
LP-1-7	1	CLD-29	42	3.4 E-08	PASS
LP-1-8	1	CLD-32	56	2.1 E-08	PASS
LP-1-9	1	CLD-37	38	2.9 E-08	PASS
LP-1-10	1	CLD-40	52	2.2 E-08	PASS
LP-1-11	1	CLD-43	60	5.0 E-08	PASS
LP-1-12	1	CLD-48	46	1.8 E-08	PASS
LP-1-13	1	CLD-95	33	3.6 E-08	PASS
LP-1-14	1	CLD-97	49	6.4 E-08	PASS
LP-1-15	1	CLD-238	20	3.1 E-08	PASS
LP-1-16	1	CLD-243	51	3.6 E-08	PASS

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-2-1	2	CLD-54	55	5.1 E-08	PASS
LP-2-2	2	CLD-60	41	2.1 E-08	PASS
LP-2-3	2	CLD-62	37	3.6 E-08	PASS
LP-2-4	2	CLD-67	10	3.0 E-08	PASS
LP-2-5	2	CLD-71	12	6.1 E-08	PASS
LP-2-6	2	CLD-121	3	1.7 E-08	PASS
LP-2-7	2	CLD-126	28	3.5 E-08	PASS
LP-2-8	2	CLD-128	59	2.8 E-08	PASS
LP-2-9	2	CLD-133	45	2.5 E-08	PASS
LP-2-10	2	CLD-135	16	3.4 E-08	PASS
LP-2-11	2	CLD-139	31	2.6 E-08	PASS
LP-2-12	2	CLD-142	63	2.5 E-08	PASS
LP-2-13	2	CLD-146	7	2.5 E-08	PASS
LP-2-14	2	CLD-148	64	2.9 E-08	PASS
LP-2-15	2	CLD-157	66	1.7 E-08	PASS
LP-2-16	2	CLD-230	35	2.6 E-08	PASS

Project Specification:  $k < 1 \text{ E-}07 \text{ cm/s}$

(TP): Test Pad Sample

Updated on: 5/30/2008

Updated by: Helvey

# SUMMARY OF CLAY LINER HYDRAULIC CONDUCTIVITY TESTING

CONSTRUCTION OF CELL NO. 12  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA  
 BLE Project No. J07-1001-58

Cell No. 12 area = 667,000 sq ft (15.3 Acres) = 48,177 cu Clay Liner

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-3-1	3	CLD-72	57	2.0 E-08	PASS
LP-3-2	3	CLD-74	53	2.2 E-08	PASS
LP-3-3	3	CLD-76	54	3.3 E-08	PASS
LP-3-4	3	CLD-86	11	3.3 E-08	PASS
LP-3-5	3	CLD-90	10	2.8 E-08	PASS
LP-3-6	3	CLD-159	27	1.8 E-08	PASS
LP-3-7	3	CLD-163	43	2.6 E-08	PASS
LP-3-8	3	CLD-168	15	2.6 E-08	PASS
LP-3-9	3	CLD-176	61	4.6 E-08	PASS
LP-3-10	3	CLD-180	17	1.5 E-08	PASS
LP-3-11	3	CLD-182	1	1.4 E-08	PASS
LP-3-12	3	CLD-186	47	1.3 E-08	PASS
LP-3-13	3	CLD-192	65	4.9 E-08	PASS
LP-3-14	3	CLD-194	19	3.4 E-08	PASS
LP-3-15	3	CLD-255	67	4.7 E-08	PASS
LP-3-16	3	CLD-262	9	2.80E-08	PASS

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-4-1	4	CLD-98	36	2.8 E-08	PASS
LP-4-2	4	CLD-104	26	4.7 E-08	PASS
LP-4-3	4	CLD-106	24	3.5 E-08	PASS
LP-4-4	4	CLD-108	40	2.2 E-08	PASS
LP-4-5	4	CLD-109	39	2.4 E-08	PASS
LP-4-6	4	CLD-201	58	4.7 E-08	PASS
LP-4-7	4	CLD-205	14	2.8 E-08	PASS
LP-4-8	4	CLD-208	44	2.7 E-08	PASS
LP-4-9	4	CLD-214	30	2.0 E-08	PASS
LP-4-10	4	CLD-217	62	4.3 E-08	PASS
LP-4-11	4	CLD-221	6	4.0 E-08	PASS
LP-4-12	4	CLD-225	32	3.9 E-08	PASS
LP-4-13	4	CLD-229	48	2.6 E-08	PASS
LP-4-14	4	CLD-231	19	1.9 E-08	PASS
LP-4-15	4	CLD-266	68	1.80E-08	PASS
LP-4-16	4	CLD-270	21	3.1E-08	PASS

Project Specification:  $k < 1 \text{ E-}07 \text{ cm/s}$

(TP): Test Pad Sample

Updated on: 5/30/2008

Updated by: Helvey

**SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS  
WASHED SAND PROTECTIVE COVER**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 [667,000 sq ft ( 15.3 Acres)]: 6,100 cy washed sand protective cover

SAMPLE NO.	MATERIAL DESCRIPTION	HYDRAULIC CONDUCTIVITY (ASTM D 2434)  (Dense) cm/s	PERCENT FINES (<#200 seive)  %
PCSP-1-C12	Washed Sand	3.3 E-02	0.8
PCSP-2-C12	Washed Sand	2.5 E-02	2.8
PCSP-3-C12	Washed Sand	4.1 E-02	0.7
PCSP-4-C12	Washed Sand	5.1 E-02	0.8
PCSP-5-C12	Washed Sand	2.9E-02	1.0
PCSP-6-C12	Washed Sand	5.6E-02	0.5
PCSP-7-C12	Washed Sand	2.5E-02	1.0
PCSP-8-C12	Washed Sand	3.3E-02	0.9
PCSP-9-C12	Washed Sand	3.6E-02	---

PROJECT REQUIREMENTS:	$k \geq 1 \text{ E-02 cm/s}$	$\leq 5\%$
-----------------------	------------------------------	------------

**SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS  
NATIVE PROTECTIVE COVER SAND**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 [667,000 sq ft ( 15.3 Acres)]: 42,100 cy native protective cover sand

SAMPLE NO.	MATERIAL DESCRIPTION	HYDRAULIC CONDUCTIVITY (ASTM D 2434)  (Dense) cm/s
PCBW-1-C12	Yellow & brown fi.-med. SAND	4.6E-03
PCBW-2-C12	Yellow & brown fi.-med. SAND	7.9E-03
PCBW-3-C12	Yellow & brown fi.-med. SAND	1.3E-02
PCBW-4-C12	Yellow & brown fi.-med. SAND	2.6E-03
PCBW-5-C12	Yellow & brown fi.-med. SAND	1.5E-02
PCBW-6-C12	Yellow & brown fi.-med. SAND	7.8E-03
PCBW-7-C12	Yellow & brown fi.-med. SAND	8.2E-03
PCBW-8-C12	Yellow & brown fi.-med. SAND	8.0E-03
PCBW-9-C12	Yellow & brown fi.-med. SAND	6.1E-03
PCBW-10-C12	Yellow & brown fi.-med. SAND	9.3 E-03
PCBW-11-C12	Yellow & brown fi.-med. SAND	6.5 E-03
PCBW-12-C12	Yellow & brown fi.-med. SAND	1.3 E-02
PCBW-13-C12	Yellow & brown fi.-med. SAND	2.1 E-03
PCBW-14-C12	Yellow & brown fi.-med. SAND	5.8E-03
PCBW-15-C12	Yellow & brown fi.-med. SAND	4.3E-03

**PROJECT REQUIREMENTS:**

$k \geq 1 \text{ E-03 cm/s}$

**FIELD DENSITY GRIDMAP CHECKLIST**

**CONSTRUCTION QUALITY ASSURANCE - CELL NO.12  
EAST CAROLINA REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 = 759,000 sq ft (17.5 Acres) = 40,170 cy Soil Liner

MAP GRID NUMBER	FIELD DENSITY TEST NUMBER			
	SUBGRADE	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3
1	SFD-220	CLD-25	CLD-147	CLD-182
2	SFD-221	CLD-236	CLD-153	CLD-196
3	SFD-214	CLD-14	CLD-121	CLD-166
4	SFD-215	CLD-17	CLD-123	CLD-167
5	SFD-216	CLD-20	CLD-136	CLD-172
6	SFD-217	CLD-22	CLD-141	CLD-181
7	SFD-218	CLD-24	CLD-146	CLD-183
8	SFD-219	CLD-27	CLD-152	CLD-195
9	SFD-314	CLD-237	CLD-247	CLD-262
10	SFD-159	CLD-4	CLD-67	CLD-90
11	SFD-160	CLD-6	CLD-69	CLD-86
12	SFD-161	CLD-8	CLD-71	CLD-85
13	SFD-162	CLD-10	CLD-119	CLD-158
14	SFD-190	CLD-13	CLD-120	CLD-165
15	SFD-191	CLD-16	CLD-122	CLD-168
16	SFD-192	CLD-19	CLD-135	CLD-173
17	SFD-193	CLD-21	CLD-140	CLD-180
18	SFD-194	CLD-23	CLD-145	CLD-184
19	SFD-195	CLD-26	CLD-151	CLD-194
20	SFD-315	CLD-238	CLD-248	CLD-260
21	SFD-316	CLD-239	CLD-249	CLD-261
22	SFD-103	CLD-2	CLD-64	CLD-91
23	SFD-165	CLD-3	CLD-65	CLD-89
24	SFD-102	CLD-5	CLD-66	CLD-88
25	SFD-106	CLD-7	CLD-68	CLD-87
26	SFD-163	CLD-9	CLD-70	CLD-84
27	SFD-164	CLD-11	CLD-118	CLD-159
28	SFD-182	CLD-12	CLD-126	CLD-164
29	SFD-183	CLD-15	CLD-129	CLD-169
30	SFD-184	CLD-18	CLD-132	CLD-174
31	SFD-185	CLD-49	CLD-139	CLD-179
32	SFD-186	CLD-51	CLD-144	CLD-185
33	SFD-187	CLD-95	CLD-150	CLD-188
34	SFD-317	CLD-240	CLD-240	CLD-240

MAP GRID NUMBER	FIELD DENSITY TEST NUMBER			
	SUBGRADE	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3
35	SFD-318	CLD-241	CLD-250	CLD-259
36	SFD-158	CLD-1	CLD-63	CLD-83
37	SFD-99	CLD-39	CLD-62	CLD-82
38	SFD-100	CLD-37	CLD-59	CLD-81
39	SFD-101	CLD-35	CLD-61	CLD-80
40	SFD-105	CLD-33	CLD-58	CLD-79
41	SFD-136	CLD-31	CLD-60	CLD-78
42	SFD-137	CLD-29	CLD-124	CLD-160
43	SFD-181	CLD-42	CLD-127	CLD-163
44	SFD-180	CLD-44	CLD-130	CLD-170
45	SFD-179	CLD-46	CLD-133	CLD-175
46	SFD-178	CLD-48	CLD-138	CLD-178
47	SFD-177	CLD-50	CLD-143	CLD-186
48	SFD-176	CLD-94	CLD-149	CLD-189
49	SFD-175	CLD-97	CLD-155	CLD-191
50	SFD-319	CLD-242	CLD-251	CLD-257
51	SFD-322	CLD-243	CLD-252	CLD-258
52	SFD-157	CLD-40	CLD-57	CLD-77
53	SFD-81R	CLD-38	CLD-56R	CLD-74
54	SFD-82	CLD-36	CLD-55	CLD-76
55	SFD-83R	CLD-34	CLD-54	CLD-73
56	SFD-84	CLD-32	CLD-53	CLD-75
57	SFD-85R	CLD-30R	CLD-52	CLD-72
58	SFD-86R	CLD-28	CLD-125	CLD-161
59	SFD-168	CLD-41	CLD-128	CLD-162
60	SFD-169	CLD-43	CLD-131	CLD-171
61	SFD-170	CLD-45	CLD-134	CLD-176
62	SFD-171	CLD-47	CLD-137	CLD-177
63	SFD-172	CLD-92	CLD-142	CLD-187
64	SFD-173	CLD-93	CLD-148	CLD-190
65	SFD-174	CLD-96	CLD-154	CLD-192
66	SFD-320	CLD-244	CLD-244	CLD-244
67	SFD-321	CLD-245	CLD-253	CLD-255
68	SFD-322	CLD-246	CLD-254	CLD-256

**FIELD GRAINSIZE GRIDMAP CHECKLIST - PAGE 1**

**CONSTRUCTION QUALITY ASSURANCE - CELL 12**

**EAST CAROLINA REGIONAL MSW LANDFILL**

**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 = 667,000 sq ft (15.3 Acres) = 50,000 cy Clay Liner

PAGE 1 OF 2

MAP GRID NUMBER	Bottom 18 inches < 3-inch sieve Top 6 inches < 1-inch sieve			
	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
1	PASS		PASS	
2		PASS		PASS
3	PASS		PASS	
4		PASS		PASS
5	PASS		PASS	
6		PASS		PASS
7	PASS		PASS	
8		PASS		PASS
9	PASS		PASS	
10		PASS		PASS
11	PASS		PASS	
12		PASS		PASS
13	PASS		PASS	
14		PASS		PASS
15	PASS		PASS	
16		PASS		PASS
17	PASS		PASS	
18		PASS		PASS
19	PASS		PASS	
20		PASS		PASS
21		PASS		PASS
22	PASS		PASS	
23		PASS		PASS
24	PASS		PASS	
25		PASS		PASS
26	PASS		PASS	
27		PASS		PASS
28	PASS		PASS	
29		PASS		PASS
30	PASS		PASS	
31		PASS		PASS
32	PASS		PASS	
33		PASS		PASS
34	PASS		PASS	

MIN. NUMBER OF TESTS PER LIFT	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
	17	17	17	17
<b>NUMBER OF TESTS REQUIRED:</b>	<b>68</b>			
<b>NUMBER OF TESTS PERFORMED:</b>	<b>68</b>			

Maximum Particle Size Criteria: Bottom 18 inches < 3-inch sieve  
Top 6 inches < 1-inch sieve

Note (1): Each test represents 20,000 sf of each lift.

**FIELD GRAINSIZE GRIDMAP CHECKLIST - PAGE 2**

**CONSTRUCTION QUALITY ASSURANCE - CELL 12**

**EAST CAROLINA REGIONAL MSW LANDFILL**

**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 = 667,000 sq ft (15.3 Acres) = 50,000 cy Clay Liner

PAGE 2 OF 2

MAP GRID NUMBER	Bottom 18 inches < 3-inch sieve Top 6 inches < 1-inch sieve			
	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
35		PASS		PASS
36	PASS		PASS	
37		PASS		PASS
38	PASS		PASS	
39		PASS		PASS
40	PASS		PASS	
41		PASS		PASS
42	PASS		PASS	
43		PASS		PASS
44	PASS		PASS	
45		PASS		PASS
46	PASS		PASS	
47		PASS		PASS
48	PASS		PASS	
49		PASS		PASS
50	PASS		PASS	
51	PASS		PASS	
52		PASS		PASS
53	PASS		PASS	
54		PASS		PASS
55	PASS		PASS	
56		PASS		PASS
57	PASS		PASS	
58		PASS		PASS
59	PASS		PASS	
60		PASS		PASS
61	PASS		PASS	
62		PASS		PASS
63	PASS		PASS	
64		PASS		PASS
65	PASS		PASS	
66		PASS		PASS
67	PASS		PASS	
68		PASS		PASS

MIN. NUMBER OF TESTS PER LIFT	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
	17	17	17	17
NUMBER OF TESTS REQUIRED:	68			
NUMBER OF TESTS PERFORMED:	68			

Maximum Particle Size Criteria: Bottom 18 inches < 3-inch sieve  
Top 6 inches < 1-inch sieve

Note (1): Each test represents 20,000 sf of each lift.

**SUMMARY OF DESIGN AND OPERATION PLAN  
HDPE GEOMEMBRANE TEST FREQUENCY REQUIREMENTS**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

**NONTEXTURED HDPE GEOMEMBRANE MANUFACTURED FOR PROJECT**

MATERIAL	NUMBER OF ROLLS
SMOOTH	46

TOTAL AREA OF CELL = 660,000 sf (15 acres)

TOTAL WEIGHT OF GEOMEMBRANE = 177,772 lbs.

TOTAL WEIGHT OF RESIN = 189,600 lbs. for smooth geomembrane (total weight of the lot from which this geomembrane was manufactured)

**TESTING REQUIREMENTS**

TEST	CQA PLAN					
	REQUIRED FREQUENCY		NO. OF REQUIRED TESTS		NO. OF PERFORMED TESTS	
	CQC	CQA	CQC	CQA	CQC	CQA
			Smooth	Smooth	Smooth	Smooth
<b>MANUFACTURED SHEET</b>						
THICKNESS (ASTM D 5199)	Every roll	Every Roll	46	46	46	46
SHEET DENSITY (ASTM D 792) OR (ASTM D 1505)	1 per 200,000 lbs. <sup>(2)</sup>	SEE NOTE 1	1	4	12	4
TENSILE PROPERTIES (ASTM D 6693, GRI GM13)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	9	4	12	4
TEAR RESISTANCE (ASTM D 1004)	1 per 45,000 lbs. <sup>(3)</sup>	SEE NOTE 1	4	4	12	4
NCTL (ASTM D 5397, GRI GM-10)	1 per resin lot	NONE	1	---	12	---
PUNCTURE RESISTANCE (ASTM D 4833)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	4	---	12	---
CARBON BLACK CONTENT (ASTM D 1603) OR (ASTM D 4218)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	9	4	12	4
CARBON BLACK DISPERSION (ASTM D 5596, Category 1 or 2)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	4	---	12	---
MELT INDEX (ASTM D 1238)	NONE	SEE NOTE 1	---	4	---	4

NOTE (1): Cube root of the total number of rolls

NOTE (2): Pounds of resin

NOTE (3): Pounds of geomembrane

**POLY-FLEX LINER  
LIMITED WARRANTY**

Warranty No.: 08 - 135 - 47  
Project No.: 277329  
Effective Date: 1 / 7 / 2008

USER: <u>Republic Services, Inc.</u>	PROJECT NAME: <u>East Carolina Environmental</u>
ADDRESS: <u>9650 Oxford Road</u>	DESCRIPTION: <u>Landfill</u>
CITY, STATE, ZIP: <u>Rougemount, NC 27572</u>	ADDRESS: <u>1922 Republican Road</u>
	CITY, STATE, ZIP: <u>Aulander, NC 27805</u>

POLY-FLEX, INC. warrants each Poly-Flex Liner to be free from defects in materials and to be able to withstand normal weathering from the date of installation for a period of twenty (20) years for normal use in approved applications.

This Limited Warranty does not include damages or defects in the Poly-Flex Liner resulting from acts of God, casualty or catastrophe including but not limited to: earthquakes, floods, piercing hail, tornados or force majeure. The term "normal use" as used herein does not include, among other things, the exposure of the Poly-Flex Liner to harmful chemicals, abuse of the Poly-Flex Liner by machinery, equipment or people, excessive pressures or stress from any source. This Limited Warranty is intended for commercial use only and is not in effect for a "consumer" as defined in the Magnuson-Moss Warranty Act or any similar federal, state, or local statutes.

Should defects or premature loss of use within the scope of the above Limited Warranty occur, Poly-Flex, Inc. will, at its option, repair or replace the Poly-Flex Liner on a pro-rata basis at the then current price in such manner as to charge the Purchaser/User only for that portion of the warranted life which has elapsed since purchase of the material. Poly-Flex, Inc. will have the right to inspect and determine the cause of any alleged defect in the Poly-Flex Liner and to take appropriate steps to repair or replace the Poly-Flex Liner if a defect exists and is within the term of this Limited Warranty.

Any claim for any alleged breach of this Limited Warranty must be made in writing, by certified mail, to the President of Poly-Flex, Inc. within thirty (30) days after the alleged defect is first noticed. Should the required notice not be given, the defect and all warranties shall be deemed to have been waived by the Purchaser/User, and Purchaser/User shall have no right of recovery against Poly-Flex, Inc. In the event repairs and/or replacements are to be effected, said repairs and/or replacements shall not become due until the area subject to repair and/or replacement of Poly-Flex Liner is available in a clean, dry, unencumbered condition, including without limitation being free from all water, dirt, sludge, residuals, and liquids of any kind.

Poly-Flex, Inc.'s, and its related entities', officers', shareholders', affiliates', agents', assigns', and successors' liability under this Limited Warranty shall in no event exceed the replacement cost of the material for the particular installation. Further, under no circumstances shall Poly-Flex, Inc., and/or its related entities, officers, shareholders, affiliates, agents, assigns and/or successors be liable for any special, direct, indirect, or consequential damages arising from loss of production or any other losses, including losses due to personal injuries and product liability, owing to the failure of the material or improper installation and no allowance will be made for repairs, replacements, or alterations made by the Purchaser/User without the express written consent of an officer of Poly-Flex, Inc.

**BY USE OF THIS PRODUCT IT IS AGREED THAT ANY CONTROVERSY OR CLAIM ARISING OUT OF OR RELATING TO SAID USE SHALL BE DECIDED BY BINDING ARBITRATION IN ACCORDANCE WITH THE UNITED STATES ARBITRATION ACT (Title 9, U.S. Code) IN DALLAS, TEXAS. THE ARBITRATION SHALL BE CONDUCTED BY A MUTUALLY AGREEABLE ARBITRATOR. IF THE PARTIES ARE UNABLE TO AGREE UPON AN ARBITRATOR, THEN EACH PARTY SHALL PICK AN INDIVIDUAL QUALIFIED TO SERVE AS AN ARBITRATOR AND THOSE TWO INDIVIDUALS SHALL THEN APPOINT A THIRD ARBITRATOR. THE ARBITRATOR'S AWARD SHALL BE FINAL AND MAY BE CONFIRMED BY THE JUDGMENT OF A STATE OR FEDERAL COURT IN THE JURISDICTION WHERE THE ARBITRATION OCCURRED. THE ARBITRATOR(S) SHALL HAVE NO POWER OR AUTHORITY TO AWARD EXEMPLARY OR PUNITIVE DAMAGES, OR TO ALTER, AMEND, OR SUPPLEMENT ANY TERM, CONDITION, OR PROVISION OF THIS AGREEMENT. THE PARTIES**

**CONSENT TO JURISDICTION AND VENUE IN COMPETENT STATE AND FEDERAL COURTS IN DALLAS, TEXAS. EACH PARTY SHALL BEAR ITS OWN ATTORNEY'S FEES, REGARDLESS OF THE OUTCOME OF THE ARBITRATION. ALL COSTS OF ARBITRATION, INCLUDING BUT NOT LIMITED TO FILING FEES, ARBITRATOR(S) FEES, AND STENOGRAPHER FEES, SHALL BE SHARED EQUALLY BY THE PARTIES.**

Poly-Flex, Inc. neither assumes nor authorizes any person other than an officer of Poly-Flex, Inc. to assume for it any other or additional liability in connection with the Poly-Flex Liner made the basis of this Limited Warranty. The Limited Warranty on the Poly-Flex Liner herein is given in lieu of all other possible warranties, either express or implied, including warranties of merchantability and of fitness for a particular purpose and by accepting delivery of the material, Purchaser/User waives all other possible warranties, except those specifically given.

The parties expressly agree that the sale of the Poly-Flex Liner is for commercial or industrial use only.

The Poly-Flex Liner Limited Warranty is extended to the Purchaser/User and is non-transferable and non-assignable, without the written consent of an officer of Poly-Flex, Inc.

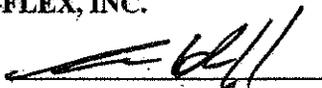
**POLY-FLEX, INC. MAKES NO WARRANTY OF ANY KIND OTHER THAN THAT GIVEN ABOVE AND HEREBY DISCLAIMS ALL WARRANTIES, BOTH EXPRESS OR IMPLIED, OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

If any provision of this Warranty shall be found to be illegal, invalid, or unenforceable under the present or future laws, such provision shall be fully severable and the remaining provisions shall remain in full force and effect. Any provision of this Warranty held illegal, invalid, or unenforceable shall remain in full force and effect to the extent not so held. In lieu of the provision held illegal, invalid, or unenforceable, there shall be automatically added as part of this Warranty a provision as similar in its terms to such invalid provision as may be possible and may be legal, valid, and enforceable.

**I have read and agree to be bound by the terms and conditions of the foregoing warranty. The said warranty shall not be honored until an original dated and signed copy, by an authorized representative of User, has been duly returned to Poly-Flex and until full payment has been made to Poly-Flex.**

**POLY-FLEX, INC.**

By:



Its:

Vice-President

USER: \_\_\_\_\_

By: \_\_\_\_\_

Its: \_\_\_\_\_

**POLY-FLEX, INC.**

2000 W. Marshall Drive

Grand Prairie, TX 75051

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SUMMARY OF CQA CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTHE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST (2)	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT				
		Roll Number/Resin Batch Number				
Thickness (2) (mils) ASTM D 5199	≥ 60	61	61	60	61	
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.9498	0.949	0.9488	0.9486	
Carbon Black Content (%) ASTM D 1603	2 to 3	2.38	2.39	2.36	2.38	
Tensile Properties ASTM D 638	Strength (3)	At Yield, ppi	216/207	203/205	201/203	209/219
		At Break, ppi	375/329	323/350	325/363	358/368
Tensile Properties ASTM D 638	Elongation (3)	At Yield, %	18/18	18/17	18/17	18/17
		At Break, %	801/784	768/821	763/843	775/828
Tear Resistance (1) (pounds) ASTM D 1004 Die C	≥ 42	59/56	59/55	59/55	57/53	
Melt Index (grams/10 minutes) ASTM D 1238	NONE	0.1040	0.1054	0.1062	0.1016	
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	

NOTE (1): Test values are machine direction / transverse direction.  
NOTE (2): Lowest individual measurement shown. All 46 rolls achieved ≥ 60 mil thickness.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE (1)		CONFORMANCE TEST RESULT			
TEST	REQUIRED TEST VALUE	Roll Number/Resin Batch Number			
		HS2-6-07-6076-5 8271447	HS2-6-07-6080-5 8271447	HS2-6-07-6084-5 8271447	HS2-6-07-6092-5 8271447
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.947	0.947	0.947	0.947
Thickness (2) (mils) ASTM D 5199	≥ 60	60	61	60	61
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.5	2.5	2.3	2.3
Tensile Properties ASTM D 6693	Strength				
	At Yield, ppi	163	168	172	180
	At Break, ppi	310	329	339	356
Tensile Properties ASTM D 6693	Elongation				
	At Yield, %	21	18	21	21
	At Break, %	781	893	819	867
Puncture Resistance (pounds) ASTM D 4833	≥ 90	154	154	161	161
Tear Resistance (pounds) ASTM D 1004	≥ 42	56	51	57	58
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1	1	1
NCTL (hrs.) ASTM D 5397	≥ 300	PASS	PASS	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 46 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5199) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE (1) TEST	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT			
		Roll Number/Resin Batch Number			
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	8271447 0.947	8271447 0.947	8271447 0.947	8271447 0.948
Thickness (2) (mils) ASTM D 5199	≥ 60	60	61	60	60
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.3	2.3	2.4	2.5
Tensile Properties ASTM D 6693	Strength				
	At Yield, ppi	176	172	171	181
	At Break, ppi	343	329	343	340
Tensile Properties ASTM D 6693	Elongation				
	At Yield, %	18	21	18	18
	At Break, %	929	834	940	929
Puncture Resistance (pounds) ASTM D 4833	≥ 90	156	161	151	157
Tear Resistance (pounds) ASTM D 1004	≥ 42	54	58	53	54
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1	1	1
NCTL (hrs.) ASTM D 5397	≥ 300	PASS	PASS	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 46 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5199) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lannons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT	
		Roll Number	Resin Batch Number
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	HS2-6-07-6116-5 8271447	HS2-6-07-6120-5 8271447
Thickness <sup>(2)</sup> (mils) ASTM D 5199	≥ 60	60	61
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.2	2.3
Tensile Properties ASTM D 6693	Strength	At Yield, ppi 171	At Yield, ppi 179
	Elongation	At Break, ppi 308	At Break, ppi 346
Puncture Resistance (pounds) ASTM D 4833	At Yield, % ≥ 12	21	18
	At Break, % ≥ 100	800	915
Tear Resistance (pounds) ASTM D 1004	≥ 90	154	159
	≥ 42	58	54
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1
	NCTL (hrs.) ASTM D 5397	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>

NOTE: All 46 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5199) requirements. The resin lots passed NCTL testing.

**SUMMARY OF DESIGN AND OPERATION PLAN  
HDPE GEOMEMBRANE TEST FREQUENCY REQUIREMENTS**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

**TEXTURED HDPE GEOMEMBRANE MANUFACTURED FOR PROJECT**

MATERIAL	NUMBER OF ROLLS
TEXTURED	16

TOTAL AREA OF CELL = 660,000 sf (15 acres)

TOTAL WEIGHT OF GEOMEMBRANE = 65,981 lbs.

TOTAL WEIGHT OF RESIN = 192,500 lbs. for textured geomembrane (total weight of the lot from which this geomembrane was manufactured)

**TESTING REQUIREMENTS**

TEST	CQA PLAN					
	REQUIRED FREQUENCY		NO. OF REQUIRED TESTS		NO. OF PERFORMED TESTS	
	CQC	CQA	CQC	CQA	CQC	CQA
			Textured	Textured	Textured	Textured
<b>MANUFACTURED SHEET</b>						
THICKNESS (ASTM D 5994)	Every roll	Every roll	16	16	16	16
SHEET DENSITY (ASTM D 792) OR (ASTM D 1505)	1 per 200,000 lbs. <sup>(2)</sup>	SEE NOTE 1	1	3	5	3
TENSILE PROPERTIES (ASTM D 6693, GRI GM13)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	4	3	5	3
TEAR RESISTANCE (ASTM D 1004)	1 per 45,000 lbs. <sup>(3)</sup>	SEE NOTE 1	2	3	5	3
NCTL (ASTM D 5397, GRI GM-10)	1 per resin lot	NONE	1	---	1	---
PUNCTURE RESISTANCE (ASTM D 4833)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	2	---	5	---
CARBON BLACK CONTENT (ASTM D 1603) OR (ASTM D 4218)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	4	3	5	3
CARBON BLACK DISPERSION (ASTM D 5596, Category 1 or 2)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	2	---	5	---
ASPERITY HEIGHT (GRI GM-12)	1 per 2 rolls	NONE	8	---	16	---
MELT INDEX (ASTM D 1238)	NONE	SEE NOTE 1	---	3	---	3

NOTE (1): Cube root of the total number of rolls

NOTE (2): Pounds of resin

NOTE (3): Pounds of geomembrane

**SUMMARY OF CQA CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERKIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lannons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST (1)	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT			
		HT1-6-07-7604-5 8271440	HT1-6-07-7610-05 8271440	HT1-6-07-7617-05 8271440	
Thickness (mils) ASTM D 5994	≥ 60	60	60	61	
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.9497	0.9490	0.9488	
Carbon Black Content (%) ASTM D 1603	2 to 3	2.44	2.36	2.39	
Tensile Properties ASTM D 638	Strength (3)	At Yield, ppi	211/212	201/205	220/211
		At Break, ppi	276/213	257/192	250/219
Tensile Properties ASTM D 638	Elongation (3)	At Yield, %	18/17	18/17	17/17
		At Break, %	550/500	517/410	485/482
Tear Resistance (1) ASTM D 1004 Die C	≥ 42	61/60	63/58	61/56	
Melt Index (grams/10 minutes) ASTM D 1238	NONE	0.2256	0.2197	0.2039	
<b>APPROVED</b>					
	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	

NOTE (1): Test values are machine direction / transverse direction.  
NOTE (2): Lowest individual measurement shown. All 16 textured rolls achieved ≥ 60 mil thickness.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT			
		Roll Number/Resin Batch Number			
		HTI-6-07-7604-5 8271440	HTI-6-07-7612-5 8271440	HTI-6-07-7616-5 8271440	HTI-6-07-7621-5 8271440
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.948	0.948	0.948	0.948
Thickness <sup>(2)</sup> (mils) ASTM D 5994	≥ 60	60	61	60	61
Asperity (mil) GRI GM 12	≥ 10	22/21	23/22	23/23	21/23
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.5	2.4	2.3	2.5
Tensile Properties ASTM D 6693	Strength	175	176	177	176
	At Yield, ppi	172	193	181	167
Tensile Properties ASTM D 6693	Elongation	18	18	19	18
	At Yield, %	472	525	473	450
Puncture Resistance (pounds) ASTM D 4833	≥ 90	151	157	160	154
Tear Resistance (pounds) ASTM D 1004 Die C	≥ 42	55	57	57	54
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1	1	1
NCTL (lbs.) ASTM D 5397	≥ 300	PASS	PASS	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 16 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Roll # 5  
HTI-6-07-7522-5  
HTI-6-07-7547-5  
**TRANSFERRED  
TO EAST CAROLINA**

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST		REQUIRED TEST VALUE	CONFORMANCE TEST RESULT					
			Roll Number/Resin Batch Number					
			HTI-6-07-7520-5 8271517	HTI-6-07-7525-5 8271517	HTI-6-07-7528-5 8271517	HTI-6-07-7533-5 8271517	HTI-6-07-7536-5 8271517	
Thickness (mils) ASTM D 5994		≥ 60	60	60	60	61	60	
Carbon Black Content (%) ASTM D 1603		2 to 3	2.7	2.7	2.6	2.7	2.6	
Tear Resistance (pounds) ASTM D 1004 Die C		≥ 42	57	54	56	57	57	
Puncture Resistance (pounds) ASTM D 4833		≥ 90	152	154	152	158	149	
Tensile Prop. ASTM D 638	Strength	At Yield, psi	≥ 126	171	168	171	174	171
		At Break, psi	≥ 90	164	180	178	192	174
Tensile Properties ASTM D 638	Elongation	At Yield, %	≥ 12	19	18	17	19	19
		At Break, %	≥ 100	394	502	460	515	472
Carbon Dispersion (Category) ASTM D 5596		Cat 1 or 2	1	1	1	1	1	
Sheet Density (grams/cc) ASTM D 1505		≥ 0.94	0.948	0.947	0.947	0.947	0.947	
NCTL (hrs.) ASTM D 5397		≥ 300	PASS	PASS	PASS	PASS	PASS	
Asperity Height (mils) GRI GM 12		≥ 10	24/24	20/20	20/20	21/23	21/21	
<b>PROVED</b>			<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	

NOTE: All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Roll # 3  
HT1-6-07-7522-5  
HT1-6-07-7547-5  
TRANSFERRED TO EAST  
CAROLINA

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST		REQUIRED TEST VALUE	CONFORMANCE TEST RESULT					
			Roll Number/Resin Batch Number					
			HT1-6-07-7540-5 8271517	HT1-6-07-7544-5 8271517	HT1-6-07-7548-5 8271517	HT1-6-07-7553-5 8271517	HT1-6-07-7556-5 8271517	
Thickness (mils) ASTM D 5994		≥ 60	60	61	60	60	60	
Carbon Black Content (%) ASTM D 1603		2 to 3	2.2	2.6	2.6	2.5	2.6	
Tear Resistance (pounds) ASTM D 1004 Die C		≥ 42	54	53	54	59	57	
Puncture Resistance (pounds) ASTM D 4833		≥ 90	158	155	153	153	153	
Tensile Prop. ASTM D 638	Strength	At Yield, ppi	≥ 126	167	163	163	185	181
		At Break, ppi	≥ 90	167	162	170	175	171
Tensile Properties ASTM D 638	Elongation	At Yield, %	≥ 12	18	18	18	17	18
		At Break, %	≥ 100	477	420	446	457	469
Carbon Dispersion (Category) ASTM D 5596		Cat 1 or 2	1	1	1	1	1	
Sheet Density (grams/cc) ASTM D 1505		≥ 0.94	0.948	0.948	0.948	0.948	0.948	
NCTL (hrs.) ASTM D 5397		≥ 300	PASS	PASS	PASS	PASS	PASS	
Asperity Height (mils) GRI GM 12		≥ 10	21/23	19/19	19/19	25/25	24/25	
<b>PROVED</b>			<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	

NOTE: All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Roll #'s  
HT1-6-07-7522-5  
HT1-6-07-7547-5  
TRANSFERRED TO  
EAST CAROLINA

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST			REQUIRED TEST VALUE	CONFORMANCE TEST RESULT				
				Roll Number/Resin Batch Number				
				HT1-6-07-7560-5 8271517	HT1-6-07-7565-5 8271517	HT1-6-07-7568-5 8271517	HT1-6-07-7572-5 8271517	HT1-6-07-7576-5 8271519
Thickness (mils) ASTM D 5994			≥ 60	61	61	60	61	60
Carbon Black Content (%) ASTM D 1603			2 to 3	2.3	2.5	2.5	2.5	2.6
Tear Resistance (pounds) ASTM D 1004 Die C			≥ 42	57	55	57	57	56
Puncture Resistance (pounds) ASTM D 4833			≥ 90	157	154	155	155	153
Tensile Properties ASTM D 638	Strength	At Yield, ppi	≥ 126	175	174	181	177	177
		At Break, ppi	≥ 90	164	157	178	164	141
Tensile Properties ASTM D 638	Elongation	At Yield, %	≥ 12	18	18	18	18	18
		At Break, %	≥ 100	378	397	503	450	351
Carbon Dispersion (Category) ASTM D 5596			Cat 1 or 2	1	1	1	1	1
Sheet Density (grams/cc) ASTM D 1505			≥ 0.94	0.947	0.947	0.948	0.948	0.948
NCTL (hrs.) ASTM D 5397			≥ 300	PASS	PASS	PASS	PASS	PASS
Asperity Height (mils) GRI GM 12			≥ 10	20/20	19/19	19/19	24/23	23/22
<b>APPROVED</b>				<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQA) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lannons Engineering, Inc. Project No. J07-1002-78

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST (2)		REQUIRED TEST VALUE	CONFORMANCE TEST RESULT			
			Roll Number/Resin Batch Number			
Thickness (mils) ASTM D 5994	≥ 60	HTI-6-07-7530-5 8271517	HTI-6-07-7550-5 8271517	HTI-6-07-7563-5 8271517	HTI-6-07-7584-5 8271519	HTI-6-07-7591-5 8271519
		61	61	61	61	61
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.9486	0.9481	0.9488	0.9486	0.9493
		2 to 3	2.33	2.37	2.36	2.36
Carbon Black Content (%) ASTM D 1603	≥ 126	196/201	200/209	195/192	188/182	180/181
		At Yield, ppi	242/210	245/211	244/195	250/187
Tensile Properties ASTM D 638	≥ 12	17/17	17/16	17/16	17/17	14/14
		At Break, %	559/481	546/465	544/452	541/432
Tear Resistance (lbs) ASTM D 1004	≥ 42	56/59	59/59	58/59	59/60	64/63
		Melt Index (grams/10 minutes) ASTM D 1238	NONE	0.2517	0.2310	0.2402
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

Roll #'s  
HTI-6-07-7522-5  
HTI-6-07-7547-5  
TRANSFERRED TO EAST CAROLINA

NOTE (1): Test values are machine direction / transverse direction  
NOTE (2): All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) requirements.

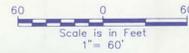


Topographic As-Built Survey for :

## REPUBLIC SERVICES OF NORTH CAROLINA, LLC

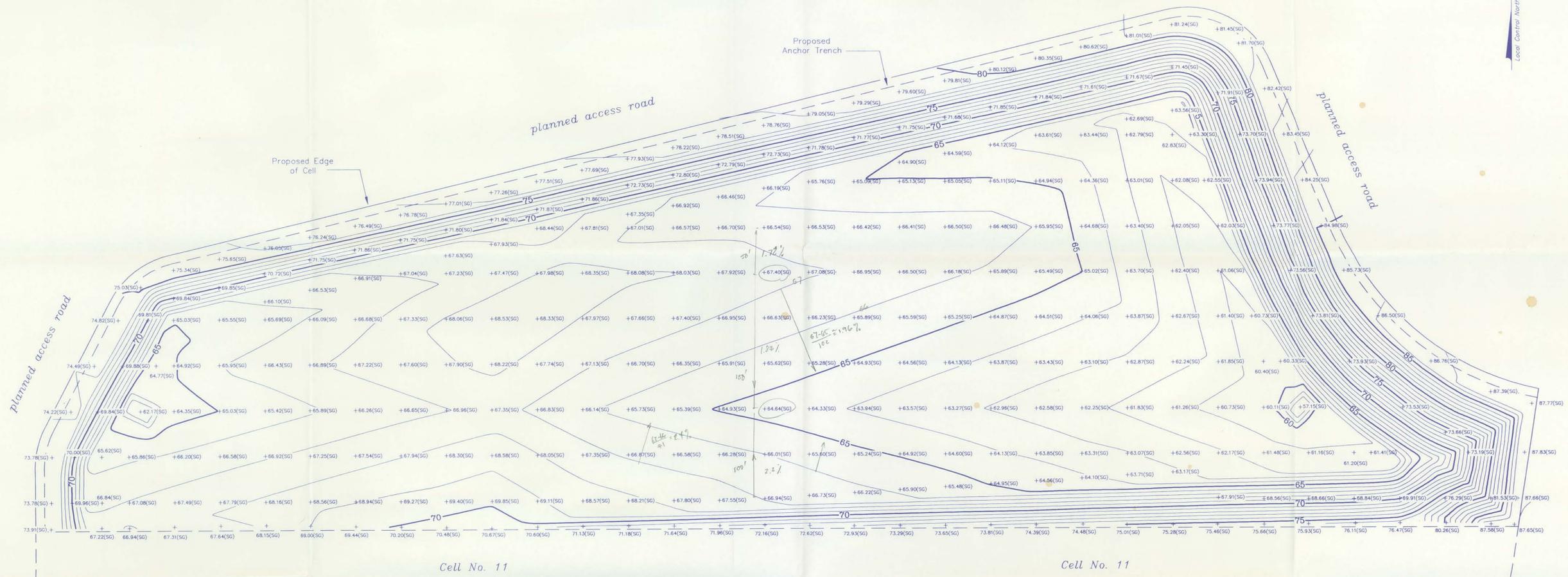
Subgrade Verification for Cell No. 12 at the East Carolina Environmental Site

Snakebite Township, Bertie County, North Carolina  
 Deed Reference Book 840 Page 853; Plat Cabinet B Slide 28.  
 Surveyed by Thomas J. Fields, PLS-2906, in January 2008.  
 REVISED & UPDATED on April 24, 2008.



Contour Interval = 1.00 Foot

From the office of  
 WRIGHT & FIELDS LAND SURVEYING  
 1340 Albemarle Road, Suite C  
 Troy, N.C. 27371



NORTH CAROLINA  
 BERTIE COUNTY

I, Thomas J. Fields, certify that this plot was drawn from an actual field survey done by me and is in all respects correct to the best of my knowledge and belief. Surface elevations shown on this plot represent measurements made of the finished SUBGRADE at the construction site of Cell No. 12. Witness my original signature and official stamp this the 24th day of April 2008.

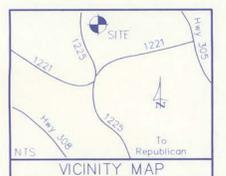
*Thomas J. Fields*  
 SURVEYOR PLS-2906



No horizontal control within 2000 feet.

### LEGEND

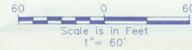
- Elevation at Existing Contours 70
- Spot Elevations at Subgrade +70.05(SG)
- One Foot Contour Interval (minor contours)
- Five Foot Contour Interval (major contours)



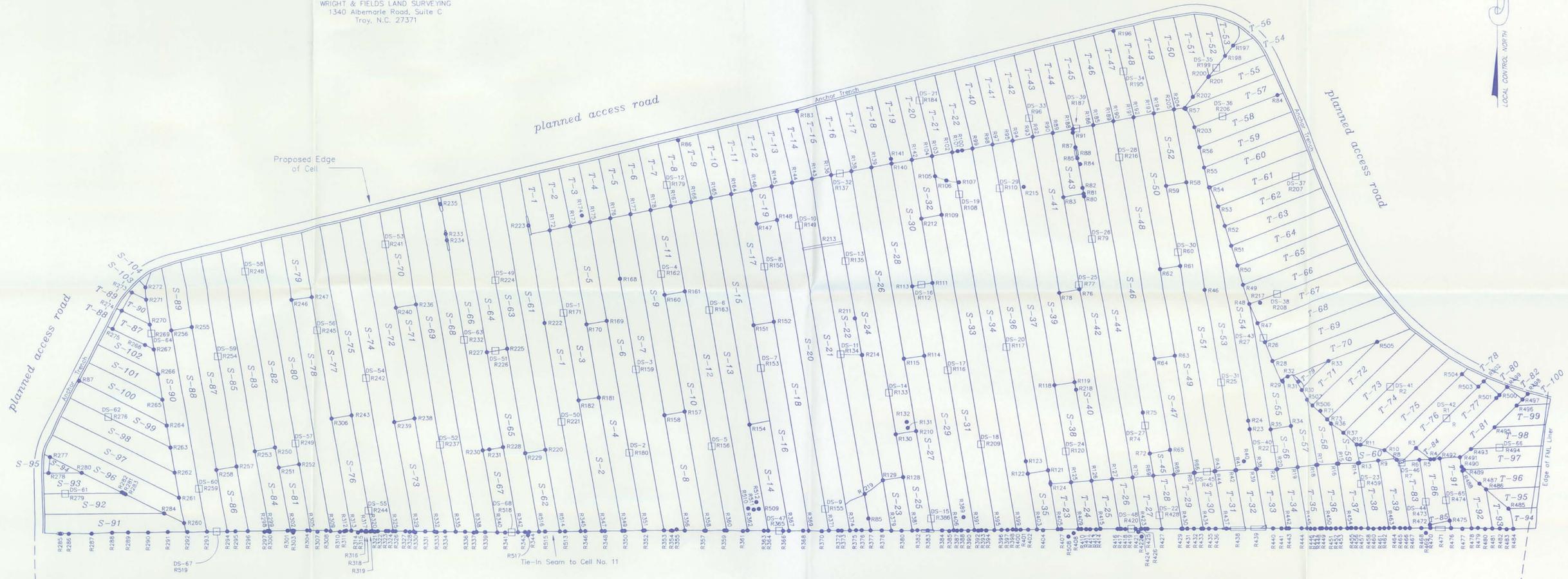
Job No. 2007-305a

As-Built Survey for:  
**REPUBLIC SERVICES OF NORTH CAROLINA, LLC**  
 Geomembrane Liner for Cell No. 12 at the East Carolina Environmental Site

Snakebite Township, Bertie County, North Carolina  
 Deed Reference Book 840 Page 853; Plat Cabinet B Slide 28.  
 Surveyed by Thomas J. Fields, PLS-2906, on March 3rd & 4th, 2008.  
 REVISED & UPDATED on May 29th, 2008.



From the office of  
**WRIGHT & FIELDS LAND SURVEYING**  
 1340 Albemarle Road, Suite C  
 Troy, N.C. 27371



Cell No. 11

Cell No. 11

NORTH CAROLINA  
 BERTIE COUNTY

I, Thomas J. Fields, certify that this plot was drawn from an actual field survey done by me and is in all respects correct to the best of my knowledge and belief. This plot was prepared for engineering and verification purposes only and is not intended for recordation, conveyance, or sale. Witness my original signature and official stamp this the 29th day of May 2008.

*Thomas J. Fields*  
 SURVEYOR PLS-2906



NOTE:  
 PANEL SEAM AND DESTRUCTIVE TEST LOCATION  
 BASED ON FIELD MEASUREMENTS BY BUNNELL-  
 LAMMONS ENGINEERING, INC.

REVIEWED BY:

*Daniel B. Bunnell*  
 DANIEL B. BUNNELL, P.E.  
 BUNNELL-LAMMONS ENGINEERING, INC. S-30-08



Legend

- T-39 ..... denotes Panel Numbers on Textured Surface Liner
- S-39 ..... denotes Panel Numbers on Smooth Surface Liner
- DS-10 ..... denotes Destruct Numbers
- ☐ ..... denotes Destruct Symbols
- R10 ..... denotes Repair Numbers
- ..... denotes Repair Symbols
- ..... denotes Bead Symbols



No horizontal control within 2000 feet.

Job No. 2007-305c

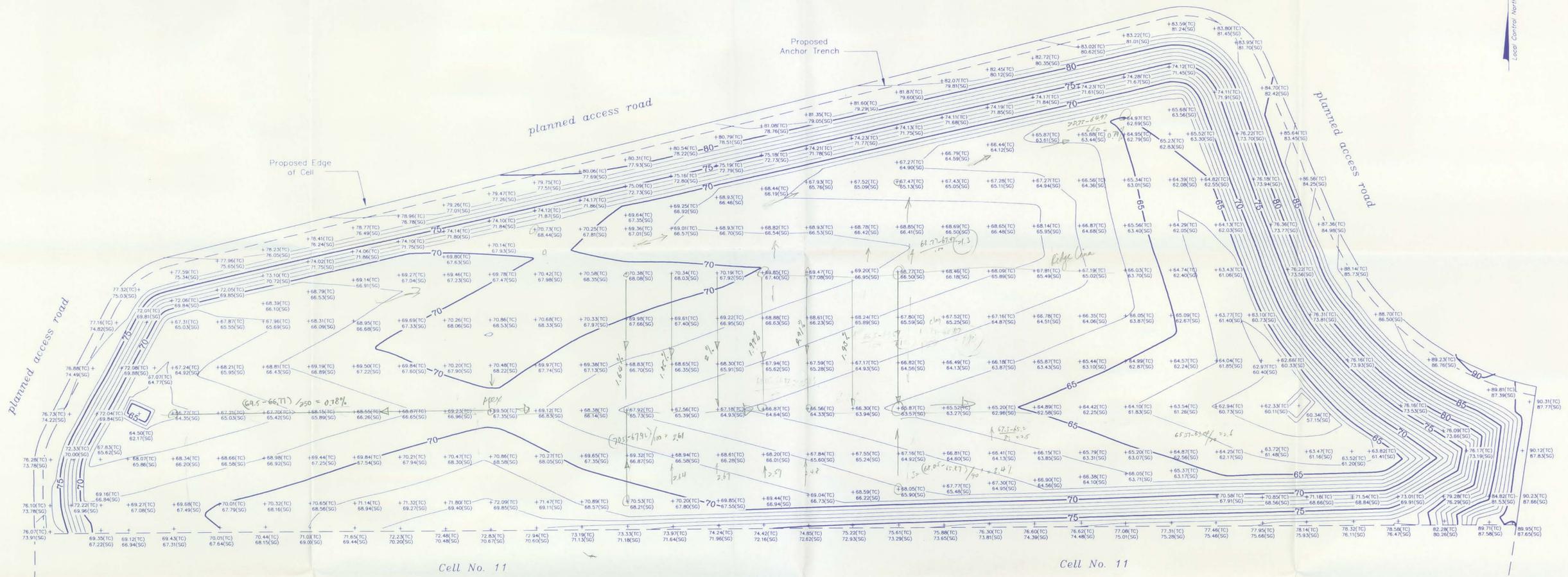
Topographic As-Built Survey for:  
**REPUBLIC SERVICES OF NORTH CAROLINA, LLC**  
 Top of Clay Verification for Cell No. 12 at the East Carolina Environmental Site

Snakebite Township, Bertie County, North Carolina  
 Deed Reference Book 840 Page 853; Plat Cabinet B Slide 28.  
 Surveyed by Thomas J. Fields, PLS-2906, on March 3rd & 4th, 2008.  
 REVISED & UPDATED on April 24, 2008.



Contour Interval = 1.00 Foot

From the office of  
**WRIGHT & FIELDS LAND SURVEYING**  
 1340 Albemarle Road, Suite C  
 Troy, N.C. 27371



NORTH CAROLINA  
 BERTIE COUNTY

I, Thomas J. Fields, certify that this plat was drawn from an actual field survey done by me and is in all respects correct to the best of my knowledge and belief. Surface elevations shown on this plat represent measurements made of the finished TOP OF CLAY at the construction site of Cell No. 12. Witness my original signature and official stamp this the 24th day of April 2008.

*Thomas J. Fields*  
 SURVEYOR PLS-2906



No horizontal control within 2000 feet.

**LEGEND**

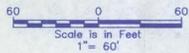
- Elevation at Existing Contours 70
- Spot Elevations at Top of Clay +72.05(TC)
- Spot Elevations at Subgrade +70.05(SG)
- One Foot Contour Interval (minor contours)
- Five Foot Contour Interval (major contours)



Job No. 2007-305b

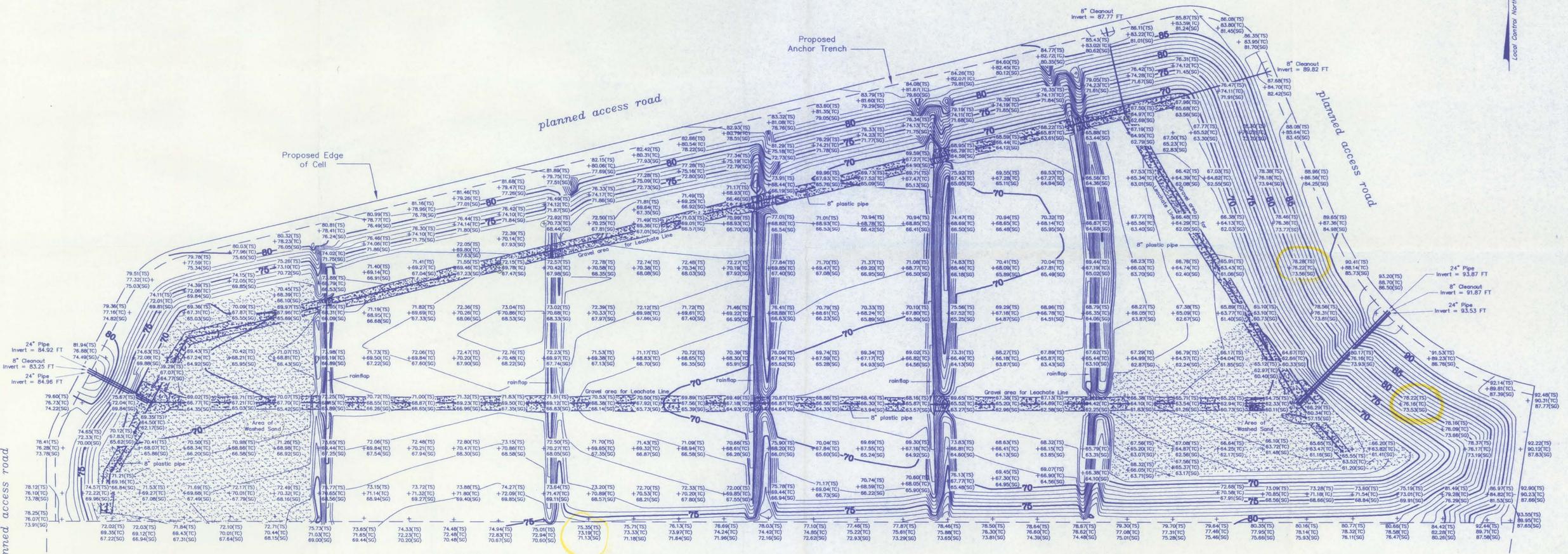
Topographic As-Built Survey for:  
**REPUBLIC SERVICES OF NORTH CAROLINA, LLC**  
 Top of Sand Verification for Cell No. 12 at the East Carolina Environmental Site

Snakebite Township, Bertie County, North Carolina  
 Deed Reference Book 840 Page 853; Plat Cabinet B Side 28.  
 Surveyed by Thomas J. Fields, PLS-2906, on April 16th & 17th, 2008.  
 REVISED & UPDATED on April 24, 2008.



Contour Interval = 1.00 Foot

From the office of  
**WRIGHT & FIELDS LAND SURVEYING**  
 1340 Albemarle Road, Suite C  
 Troy, N.C. 27371



**LEGEND**

- Elevation at Existing Contours 70
- Spot Elevations at Top of Sand 74.05(TS)
- Spot Elevations at Top of Clay 72.05(TC)
- Spot Elevations at Subgrade 70.05(SG)
- One Foot Contour Interval (minor contours)
- Five Foot Contour Interval (major contours)

NORTH CAROLINA  
 BERTIE COUNTY

I, Thomas J. Fields, certify that this plot was drawn from an actual field survey done by me and is in all respects correct to the best of my knowledge and belief. Surface elevations shown on this plot represent measurements made at the finished TOP OF SAND at the construction site of Cell No. 12. Witness my original signature and official stamp this the 24th day of April 2008.



*Thomas J. Fields*  
 SURVEYOR PLS-2906

No horizontal control within 2000 feet.



Job No. 2007-305d

**APPENDIX B**  
**RECORD OF PRECONSTRUCTION MEETING**  
**RECORDS OF DAILY OBSERVATIONS:**



**BUNNELL-LAMMONS ENGINEERING, INC.**  
 GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF PRECONSTRUCTION MEETING**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Meeting Date:** November 16, 2007

**Meeting Attendees:**

<u>NAME</u>	<u>FIRM</u>	<u>PHONE</u>	<u>EMAIL</u>
Mr. Bill Cooksey	East Carolina Landfill	(252) 348-3322	CookseyW@repsrvnc.com
Mr. Bill Hodges, P.E.	HHNT, Inc.	(912) 743-7175	HodgesWMF@aol.com
Mr. Jeff Helvey, P.E.	BLE, Inc.	(864) 346-9882	jeff@blecorp.com
Mr. Ted Stiles	BLE, Inc.	(864) 201-5517	
Mr. Scott Newman	R.B. Baker Construction	(912) 657-9336	scottn@rbbaker.com
Mr. Jack Deloach	R.B. Baker Construction	(912) 663-4735	

**Attending by Phone:**

Mr. Steve Nichting      Republic Services of N.C.      (336) 364-3699      NichtingS@repsrv.com

**Other Project Parties not Attending:**

Mr. Ray Hoffman, P.E.	Republic Services of N.C.	(828) 464-2414	<u>HoffmanRJ@repsrv.com</u>
Mr. Timmy Lee	R.B. Baker Construction	(912) 667-2268	
Mr. Dan Bunnell, P.E.	BLE, Inc.	(864) 288-1265	<u>dan@blecorp.com</u>
Mr. Hal Newberry, P.E.	HHNT, Inc.	(478) 743-7175	<u>HLNEWBERRY@aol.com</u>
Mr. Matt Cheek, P.E.	HHNT, Inc.	(478) 743-7175	<u>mcheek@aol.com</u>

**I. INTRODUCTIONS:** The meeting was conducted in the offices of East Carolina Regional MSW Landfill and was directed by Mr. Bill Hodges, P.E.

**A. Identify Parties and Responsibilities:**

1. Owner's Area Engineer: Mr. Ray Hoffman, P.E.
2. Project Manager: Mr. Steve Nichting (Project materials which are to be provided by Republic Services will be under the direction of Mr. Nichting)
3. Owner's Site Manager: Mr. Bill Cooksey
4. Design Consultant: Hodges, Harbin Newberry & Tribble, Inc. (HHNT) -  
 Mr. Bill Hodges, P.E. assisted by Mr. Hal Newberry, P.E. for material submittal review and Mr. Matt Cheek, P.E. for review of as-built drawings. Mr. Brant Lane, P.E. will also be involved in the project.

5. General Contractor: R.B. Baker Construction (Baker)
  - a. Project Manager: Mr. Scott Newman
  - b. Project Superintendent: Mr. Jack Deloach then Mr. Timmy Lee
  - c. Construction Surveying: In house (GPS)
  - d. Pipe: Plastic Fusion Fabricators (PFF)
  - e. E&S Controls: Holland (Baker will discuss other options with Mr. Cooksey)
6. Project Conformance Surveys: Wright and Fields Land Surveying, Mr. Tommy Fields, PLS
7. CQA Engineer: Bunnell-Lammons Engineering, Inc. (BLE), Mr. Dan Bunnell, P.E. – Project CQA engineer and Mr. Jeff Helvey, P.E.  
On-site CQA Engineering Technician: Mr. Ted Stiles

- B. Communication: Mr. Hodges indicated that all project communication regarding questions, comments or other construction considerations should be directed through Mr. Hodges and copied to Mr. Nichting for approval and consideration. Any change orders or requested changes to the project are to be submitted in writing to HHNT only. Only HHNT may approve design changes. Project submittals are to be sent to Mr. Hal Newberry, P.E. of HHNT.

## **II. FINANCIAL ISSUES:**

- A. Pay Requests: To include % complete for each task. Baker will estimate quantities based on a monthly in-house topographic survey of the construction and borrow areas. Submit a “prebill” electronically to HHNT and copy Mr. Nichting by the 25th of each month. The “prebill” may include projected items to be completed by the end of that month. Submit formal invoice to HHNT for review and approval.
- B. Capital allocated for 2007 must be spent in 2007. Final invoices/pay requests for 2007 must be submitted by December 21, 2007.

## **III. SITE ISSUES:**

- A. Coordinate site issues with Mr. Cooksey.

- B. Baker is to issue a copy of their safety plan to HHNT. Baker is to review the Republic Services Safety plan and sign a copy indicating that they understand and will comply with the plan.
- C. Baker does not plan on using a job site trailer. Mr. Cooksey noted that Baker may use the office of East Carolina Environmental for faxing and shipping (FedEx). Mr. Cooksey noted that East Carolina Environmental is not an every-day stop for FedEx and that they would need to be called to arrange pick-up.
- D. Cell No. 12 construction traffic must use the Cherry Property entrance road when entering the site. If the main entrance is used, the sign-in sheet in the East Carolina Environmental office must be filled out.
- E. Location of the material staging area is to be determined with guidance from Mr. Cooksey. The area around the house near the Tripp Property Borrow Area may not be used. The area around the house may be used for construction personnel personal vehicles but must be parked in an orderly manner.
- F. Yield to local traffic.
- G. Be courteous to nearby residents. Landfill activities are to be kept confidential. Keep noise to a minimum.
- H. Daily meetings are to be held between the CQA technician and the Baker Superintendent.
- I. Weekly meetings are to be held on the same day of the week, each week (no Mondays and no Fridays). Once the day of the week is agreed by the CQA technician and the Baker superintendent, the project parties will be informed. Mr. Stiles is to write a reminder about the meeting, in bold marker, across the top of a daily report 2 days prior to the meeting. Mr. Nichting and/or Mr. Hoffman may opt to attend the meetings in person or by phone. Mr. Cooksey plans to attend all meetings. Mr. Hodges plans to attend the weekly meetings twice per month. Mr. Hodges noted that Mr. Newman should plan to attend the meetings twice per month, minimum.
- J. No fueling or maintenance of equipment is allowed in the current cell construction area or in any future cell area. The CQA technician should monitor these activities.

- K. One well is to be abandoned inside the cell. Two wells are to be installed. An approximately 50-foot by 50-foot, 4-foot tall soil pad is to be constructed where GW-16R is to be installed.
- L. The local NC DENR inspector is Chuck Boyette. Expect Mr. Boyette to visit the site periodically during construction.
- M. Baker is to provide an updated schedule every 2 weeks.
- N. Baker plans to work 7 days per week from 6:30 am to 6:30 pm. Mr. Cooksey noted that Sunday work should be performed with low noise (avoid work that results in back-up alarms sounding).
- O. The volume of structural fill for Cell No. 12 is approximately 308,000 cy. The construction schedule is 165 days. Baker plans to excavate, haul, and place approximately 4,000 cy of structural fill per day.

#### **IV. CONSTRUCTION ISSUES**

- A. The grading plan for the cell is currently being updated. The subgrade elevations will increase by a few tenths in some locations to account for additional settlement expected due to the landfill expansion.
- B. Cell No. 12 will have two sumps with dual 24-inch risers. Previous cells at the landfill have leachate penetration assemblies.
- C. Storm Water Diversion Berms – rain flaps are to be installed as noted on the plans. Any changes must be approved by Mr. Hodges. Each rainflap can contain no more than 2 acres. The rain flaps are to be installed completely across the cell and up the berms a minimum of 5 feet.
- D. Subgrade elevations may be constructed to 0.1 feet below design. The top of clay elevations must be at design or higher (within the tolerance indicated in the project documents).
- E. Electrical – 3 phase electricity is currently available along the west access road up to Borrow Area 8. 3-phase electricity will be extended to operate the sump pumps in Cell No. 12 as part of this project.

- F. The CQA technician's work scope is to observe, test, and report construction activities related to the current project. Full-time CQA monitoring is required while soil is moving (structural fill, clay, protective cover, etc.) within the project construction limits.
  
- G. A test pad is not required for Cell No. 12.
  
- H. The existing pump station on the west side of the landfill is to be re-built as a change order to the Cell No. 12 construction project. Baker is to provide a price to HHNT. In order to re-build the pump station, some by-pass piping may be required. If by pass piping is used, pumps operated by the contractor must be monitored at all times. Mr. Newberry may visit the site to meet with PFF and Baker to discuss options. Mr. Cooksey noted that he has a contact for confined space entry. Mr. Cooksey noted that he wants the repairs completed as soon as possible.
  
- I. Leachate force main installation is required as part of this project. Full pressure testing is required. Primary pipe to be hydrostatically tested. Secondary pipes may be air tested. Testing is to be performed after all connections and backfill are fully in-place. Testing must be monitored by BLE. Riser pipes are 24-inch diameter, SDR-11. These pipes are larger and heavier than the riser pipes used in other HHNT projects on which Baker has served as the general contractor. 3 to 4 feet of protective cover should be mounded over the riser pipes.
  
- J. NC DENR requires that all leachate piping systems be accessible with cameras. To accomplish this, sweeps should replace bends and angled fittings as much as possible. No 90-degree bends are allowed. If absolutely necessary to install bends and angled fittings, each angled fitting should be not more than 22.5 degrees.
  
- K. Dewatering pumps must discharge into stone-lined basins or into ditches that lead to sediment ponds.
  
- L. All erosion and sediment controls noted on the plans must be installed. Baker is responsible for cleaning silt/sediment resulting from construction activities from ditches and sediment ponds.
  
- M. Construction water is available from several ponds on site. Coordinate with Mr. Cooksey.

- N. Perimeter berms for the cell must be constructed to allow the geomembrane installer access for deployment. This may require an over-build to allow access.
- O. Baker will submit an equipment list to HHNT.
- P. Haul Roads must be maintained by Baker and allow access to the borrow areas by East Carolina Landfill personnel.

**V. PROJECT SURVEYING**

- A. The contractor is responsible for construction surveying. Republic Services will perform construction quality assurance (CQA) documentation surveying. The CQA surveying will be performed by Wright and Field Land Surveying, Inc. (Wright and Fields), Mr. Tommy Fields, PLS. Mr. Fields requires a minimum of three days prior notice to the performance of needed confirmation CQA surveys. It was noted that the CQA Surveying is to be performed on completed construction only. Republic Services is not responsible and will not authorize Wright and Fields to perform construction surveying. Should CQA surveying find areas not in conformance with the design requirements, supplemental CQA surveying will be charged to Baker.
- B. Mr. Hodges indicated that routine practice is to construct the subgrade approximately 0.1 to 0.2 feet low of the design grade, and to construct the top of clay liner and the top of the protective cover to approximately 0.1 to 0.2 feet high of the design elevation. It was noted that review and acceptance of the CQA as-built survey for each layer (subgrade and clay liner) are required prior to the contractor beginning work on the subsequent construction. It is also noted that as-built surveys are required of the leachate collection pipe and sump prior to being covered. HHNT will provide a designated survey 50 foot center to center grid over the construction area which will be referenced on shots by the CQA surveyor. In addition, the CQA surveyor will shoot the toes and tops of each slope in order to properly contour each layer. Wright and Fields will survey the edges of the geomembrane and each panel. Repairs and destructive test locations will be indicated on the geomembrane as-built by BLE.

C. CQA surveys will be performed following completion of each of the following tasks:

1. Topsoil stripping in the cell area (complete)
2. Subgrade construction,
3. Compacted clay liner construction,
4. Geomembrane installation,
5. Top of protective cover, and
6. Final as built will be generated which includes the access roadway, leachate piping (inside and outside of the cell), HDPE structures and the edge of cell and edge of liner and associated storm water control ditches.

## **VI. MATERIALS**

A. Geomembrane: The 60 mil smooth and textured geomembrane will be provided by the owner. The supplier and installer have not been determined. Mr. Nichting will notify the project parties when the supplier and installer have been selected. CQA sampling, testing and review of CQA and manufacturers quality control tests will be performed and completed by BLE prior to approval for shipment of the material to the job site. Baker will receive advance notice of the delivery of the material so that they can coordinate unloading of the geosynthetic materials and proper stockpiling. Mr. Cooksey indicated that he would provide direction to Baker regarding the locations available for geosynthetic stockpiling.

B. Geotextile: Republic Services will provide the required 6-oz nonwoven cushion geotextile which is to be placed over the floor areas of the planned cell. MQC and CQA testing are required and should be complete prior to shipment to the site. The 6-oz geotextile will be installed by the geomembrane installer.

C. GCL: Approximately 2 rolls of GCL are required for the 2 sumps.

D. HDPE Structures & Piping: Baker is responsible for providing the HDPE structures and piping. The pipe and structure submittal has been provided by Baker to HHNT and is currently being reviewed. Plastic Fusion Fabricators will supply and install the pipe.

- E. 24-oz Cushion Geotextile: The required 24-oz geotextile cushion submittal should be reviewed and approved by HHNT and BLE prior to shipment of the material to the site.
- F. Washed Sand Protective Cover: Republic Services will supply the  $k \geq 1 \times 10^{-2}$  cm/s protective cover sand. BLE will visit the proposed sand sources with Mr. Cooksey to sample the proposed sand. BLE will perform laboratory testing to qualify the potential sand sources.
- G. Native Sand Protective Cover: The native sand protective cover will come from the Tripp Property Borrow Area.
- H. Leachate Collection Stone: River rock may be used if it meets the specifications for No. 57 and No. 78M stone gradations. Mr. Stiles will visit and sample the potential source.
- I. Baker requested one week notice prior to hauling of off-site sand and stone.

## **VII. BORROW SOIL MANAGEMENT**

The results of the borrow study for the Cell No. 12 borrow area (Tripp Property) are provided in the project documents. Mr. Hodges noted that the BLE engineer should meet with, Mr. Cooksey, Mr. Timmy Lee and Mr. Ted Stiles to discuss borrow soil management and to develop a borrow area management plan. The plan should include the condition of the borrow area after the contractor has completed excavation of borrow materials.

- A. Clay Processing: It was noted that the onsite clays will require moisture modification, typically drying, to achieve the required density and permeability. Disc harrows, rototillers or soil stabilizers, such as a CAT SS-250 are typically required to break the material into small enough pieces so that its moisture may be modified.
- B. Borrow Soil Excavation: It is recommended that structural fill be obtained from the borrow area beginning at the western most undisturbed end of the borrow area and proceeding to the east. Materials acceptable for use as structural fill will consist of the clayey, silty and sandy soils encountered immediately below the topsoil zone and extending down to the surface of the fine to

medium sands. The fine to medium sands underlying the structural fill are to be used only as protective cover. Clay borrow soils should also be obtained from the layer one soils below the topsoil zone in the west central portion of the site as indicated in the borrow study Figure 4. The CQA engineering technician is familiar with the site soil conditions and is available for consultation and acceptance of various soils for their intended use.

- C. Structural fill soils obtained from the borrow area will be clayey and generally wet of the optimum moisture content. These materials should be dried by discing
- D. Development of the borrow area should consist of stripping and the initial installation of a deep perimeter ditch. The perimeter ditch should extend through the layer one clayey soils and layer two sands to the bottom of a gray-green silty clay (gumbo) layer. This perimeter ditch should be pumped down to facilitate dewatering of the borrow area. It is likely that additional shallow ditches running in a north-south direction may be needed to facilitate removal of surface water and promote drainage into the rim ditches. Dewatering of the borrow pit will be required throughout the borrow excavation process. It was noted that the relatively clean fine and fine to coarse sands will "flow". The side slopes of the dewatering ditches should be adequately sloped to be stable.
- E. Wetlands: Wetlands around the site and borrow area are indicated by flagging and may not be disturbed.
- F. Overburden soils: Mr. Cooksey will coordinate the overburden soil stockpile location with Baker.

## VIII. EXISTING SITE DRAINAGE DITCH

Existing Site Drainage Ditch: Backfilling of the existing site drainage ditch is to be performed utilizing compacted clay with a permeability of  $k \leq 1 \times 10^{-7}$  cm/s. Density tests and permeability sampling and testing is to be performed on this ditch backfill by BLE. This work is currently in progress.

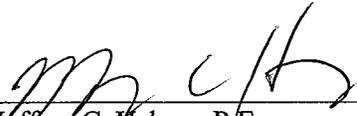
**IX. DISTRIBUTION OF DOCUMENTS: (Cell No. 12)**

The Cell No. 12 construction is detailed in the project drawings, the construction specifications and the CQA Manual prepared by HHNT. The following distribution of documents was requested:

- Baker: None
- Steve Nichting: 1 half size
- Site: 2 half size
- BLE: 1 Full Size, 1 Specifications
- Wright & Fields - None

The Notice to Proceed date is November 5, 2007.

Respectfully submitted:

  
Jeffrey C. Helvey, P.E.  
Project Engineer



Distribution: Meeting Attendees  
Mr. Steve Nichting  
Mr. Dan Bunnell, P.E.  
Mr. Ray Hoffman, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. JD7-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-12-07

PROJECT DAY NO. \_\_\_\_\_

ARRIVAL TIME: 7:20 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
~~PTLY CLOUDY~~ RAIN

TEMPERATURE:  
MORNING LOW: 34 °F  
DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

EXCAVATION OF THE TEMPORARY HAUL ROAD THROUGH CELL 12. THE MATERIAL IS BEING PLACED AND COMPACTED IN THE EXISTING BORROW AREA ACCESS ROAD NORTH OF CELL 12.

TOMMY FIELDS IS ON SITE PERFORMING THE PRE-CONSTRUCTION ASBUILT ON CELL 12. THE TRIPP PROPERTY BORROW AREA LIMITS HAVE BEEN CONFIRMED.

EXCAVATION OF WET SOILS SOUTHWEST OF SUMP 12 B. APPROXIMATELY 550 CUBIC YARDS OF MATERIAL HAS BEEN REMOVED.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED EXCAVATION OF THE TEMPORARY HAUL ROAD.

MONITORED PLACEMENT AND COMPACTION OF THE EXCAVATED SOILS IN THE BORROW PIT ACCESS ROAD. THE MATERIAL WAS PLACED IN ONE THIN LIFT AND COMPACTED WITH A CAT. 815F AND THE LOADED VOLVO TRUCKS.

MONITORED EXCAVATION OF WET SOILS.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-13-07

PROJECT DAY NO. \_\_\_\_\_

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: 1.5

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 50 °F  
DAYTIME HIGH: 70 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF CLAYEY SOILS IN THE STORM WATER CONVEYANCE CHANNEL IN CELL 12. THE MATERIAL IS BEING WATERED AND PROCESSED IN ACCORDANCE WITH THE CLAY LINER REQUIREMENTS.

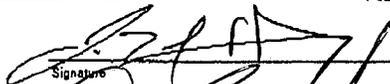
TOMMY FIELDS IS ON SITE PERFORMING THE PRE-CONSTRUCTION AS BUILT.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

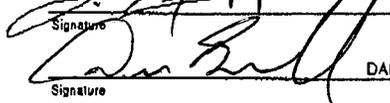
MONITORED PLACEMENT, PROCESSING AND COMPACTION OF CLAYEY SOILS IN THE STORMWATER CONVEYANCE CHANNEL BACKFILL. PERFORMED FIVE DRIVE CYLINDER DENSITY TESTS AND COLLECTED ONE PERMEABILITY SAMPLE.

RECORD PREPARED BY:



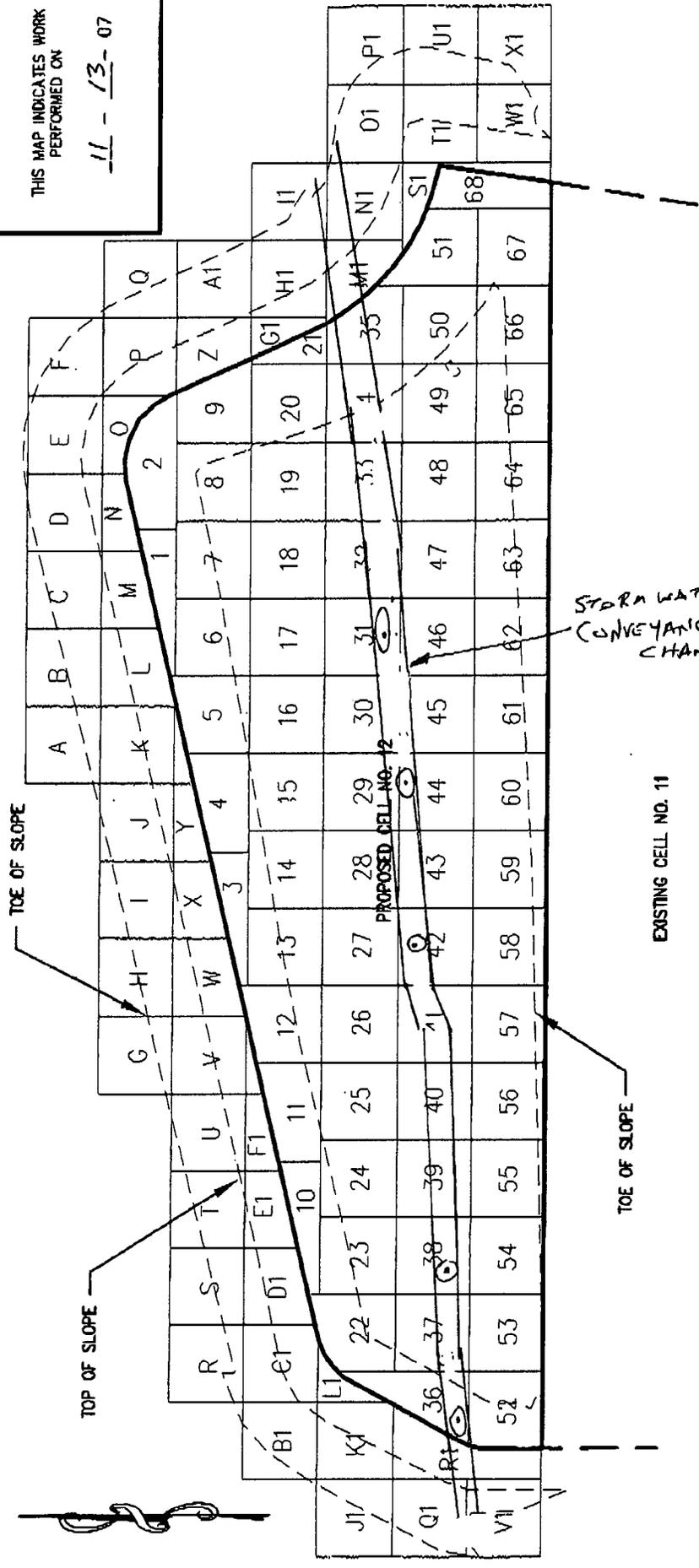
TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 11-13-07



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING 26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE: 11-01-07	FIGURE: 1
DESIGNED BY: AEFH	FIELD SKETCH - CELL NO. 12
CHECKED BY: JAG	EAST CAROLINA LANDFILL
APPROVED BY: J07-1001-58	BERTIE COUNTY, NORTH CAROLINA

**IBL**  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
 8004 PONDERS CIRCLE  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: 288-4430

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-14-07

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

PROJECT DAY NO. \_\_\_\_\_

VISITORS:

NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 54 °F  
DAYTIME HIGH: 76 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

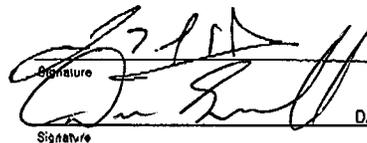
PLACEMENT, PROCESSING AND COMPACTION OF CLAYEY SOILS IN  
THE STORMWATER CONVEYANCE CHANNEL IN CELL 12.  
PLACEMENT AND COMPACTION OF FILL IN THE AREA OF  
EXCAVATED WET SOILS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

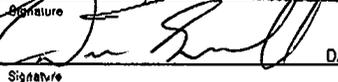
MONITORED BACKFILL OF THE STORMWATER CONVEYANCE CHANNEL  
IN CELL 12. PERFORMED THREE DRIVE CYLINDER DENSITY TESTS.  
MONITORED PLACEMENT AND COMPACTION OF FILL.

RECORD PREPARED BY:

  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature

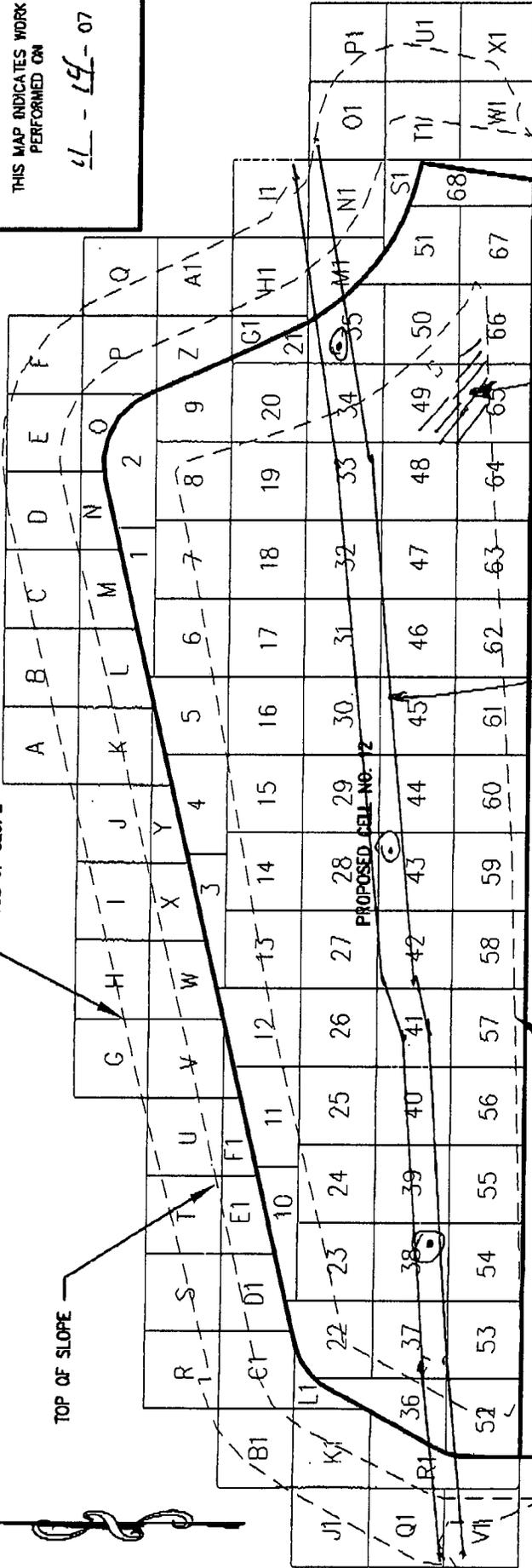
DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

11-19-07

TOE OF SLOPE

TOP OF SLOPE



STORM WATER  
CONVEYANCE  
CHANNEL

PLACE & COMPACT  
AREA

**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF  
( $100' \times 100'$ )

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

EXISTING CELL NO. 11



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES,  
HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

APP'D:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC0112
PROVED:		JOB NO.:	J07-1001-58

**BLE**  
BUNNELL-LANBORN ENGINEERING, INC.  
8004 POWERS CO.  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)286-1265 FAX: 286-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-56

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-15-07

PROJECT DAY NO. \_\_\_\_\_

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: \_\_\_\_\_

WORK HOURS: 6.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 63 °F  
DAYTIME HIGH: 69 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL. THE FILL IS BEING PLACED IN THE LOW AREAS ALONG CELL 11 TO PREVENT PONDING SURFACE WATER.

LIGHT RAIN BEGAN FALLING ON/OFF AT 8:00 AM. STEADY RAIN FALL BEGAN AT 10:30 AM. THE CONTRACTOR IS ON STANBY TO SEE IF WEATHER BREAKS.

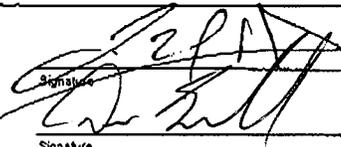
ALL WORK HALTED AT 12:00

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-16-07

PROJECT DAY NO. 12

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: 15

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ON-SITE BLE PERSONNEL: TED STILES  
JEFF HELVEY, P.E.

SCOTT NEWMAN RB BAKER  
BILL HODGES, P.E. H.H.N.-ST.

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 34 °F  
DAYTIME HIGH: 56 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL

COMPACTED CLAY LINER  
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

TOTAL RAINFALL MEASURED YESTERDAY WAS 0.6".  
BLADED WET MATERIAL FROM THE PREVIOUS FILL IN THE STORM  
WATER CONVEYANCE CHANNEL.  
PLACEMENT AND COMPACTION OF CLAYEY SOILS IN THE STORM WATER  
CONVEYANCE CHANNEL IN CELL 12.  
PRE-CONSTRUCTION MEETING HELD ON SITE (MINUTES BY OTHER)  
R.B. BAKER HAS SET UP GPS CONTROLS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

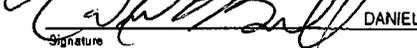
MONITORED PLACEMENT AND COMPACTION OF FILL IN THE  
STORMWATER CONVEYANCE CHANNEL BACKFILL. PERFORMED TWO  
DRIVE CYLINDER DENSITY TESTS AND COLLECTED ONE  
PERMEABILITY SAMPLE

RECORD PREPARED BY:

  
Signature

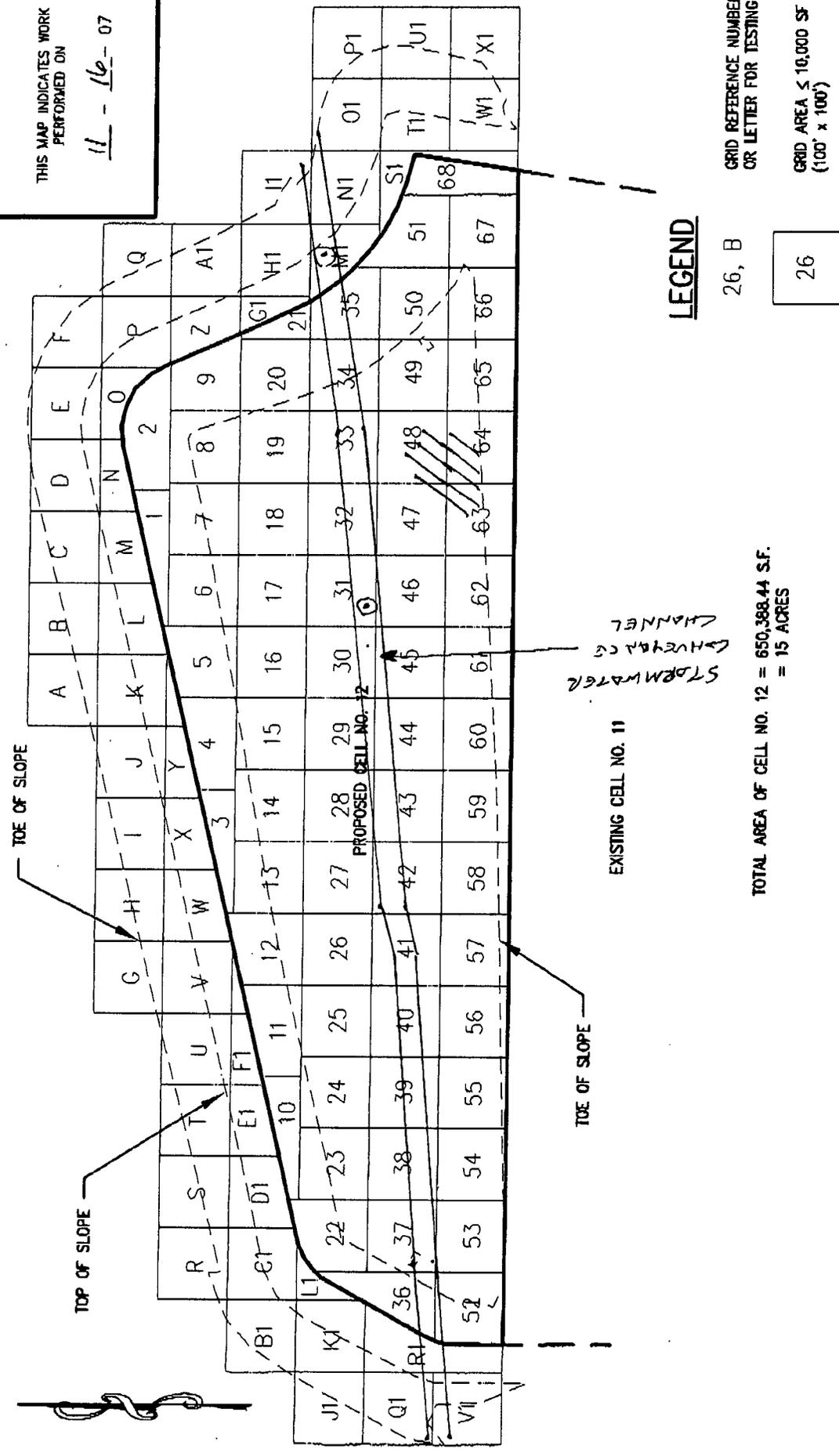
TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 11-16-07



**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE: 11-01-07		FIGURE <b>1</b>
AWN: AEH	CAD: EOLF58-FSCCELL12	
CHECKED: JAG	APPROVED: J07-1001-58	
<p><b>IBL</b>          RUMBLE-LAMMONS ENGINEERING, INC.          6004 PONDERS CIRCLE          GREENVILLE, SOUTH CAROLINA 29615          PHONE: (864)288-1255 FAX: 288-4430</p>		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA

**EQUIPMENT OF PROJECT**  
**CONSTRUCTION QUALITY ASSURANCE - CELL 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**

BURNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Page 1 of 1

EQUIPMENT	DATE / DAY							COMMENTS
	--- --07	11-12-07 Monday	11-13-07 Tuesday	11-14-07 Wednesday	11-15-07 Thursday	11-16-07 Friday	11-17-07 Saturday	
	Sunday							
CAT. D6LGP DOZIER	1	1	1	1	1	1	1	
Volvo A30D W/F ROPS	5	5	5	5	5	5	5	
CAT. 815F COMPACTOR	1	1	1	1	1	1	1	
Wheeled CHALLENGER TRACTOR	1	1	1	1	1	1	1	
Volvo EC360B EXCAVATOR	1	1	1	1	1	1	1	
Volvo G930 GRADER	1	1	1	1	1	1	1	
5000 GALLON WATER TANKER	1	1	1	1	1	1	1	
INGERSOLL RAND 5D-116 Smooth Drum COMPACTOR	1	1	1	1	1	1	1	

NUMBER REFERS TO QUANTITY OF EQUIPMENT PRESENT ONSITE ON DATE INDICATED

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, MARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-17-07  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.0

PROJECT DAY NO. 13

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 28 °F  
DAYTIME HIGH: 60 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF CLAYEY SOILS IN THE STORM WATER CONVEYANCE CHANNEL IN CELL 12.

PLACEMENT AND COMPACTION OF STRUCTURAL FILL IN THE LOW AREAS. FILL PLACED TO ELIMINATE AREAS WHERE RAIN WATER MAY POND.

\* CONTRACTOR/COA MEETING - CONTINUE BACKFILL OF CONVEYANCE CHANNEL, CONSTRUCT PAD FOR GW-16R MONITORING WELL. CONCENTRATE FILL PLACEMENT IN LOW AREAS TO PREVENT PONDING WATER OVER THE THANKSGIVING BREAK.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

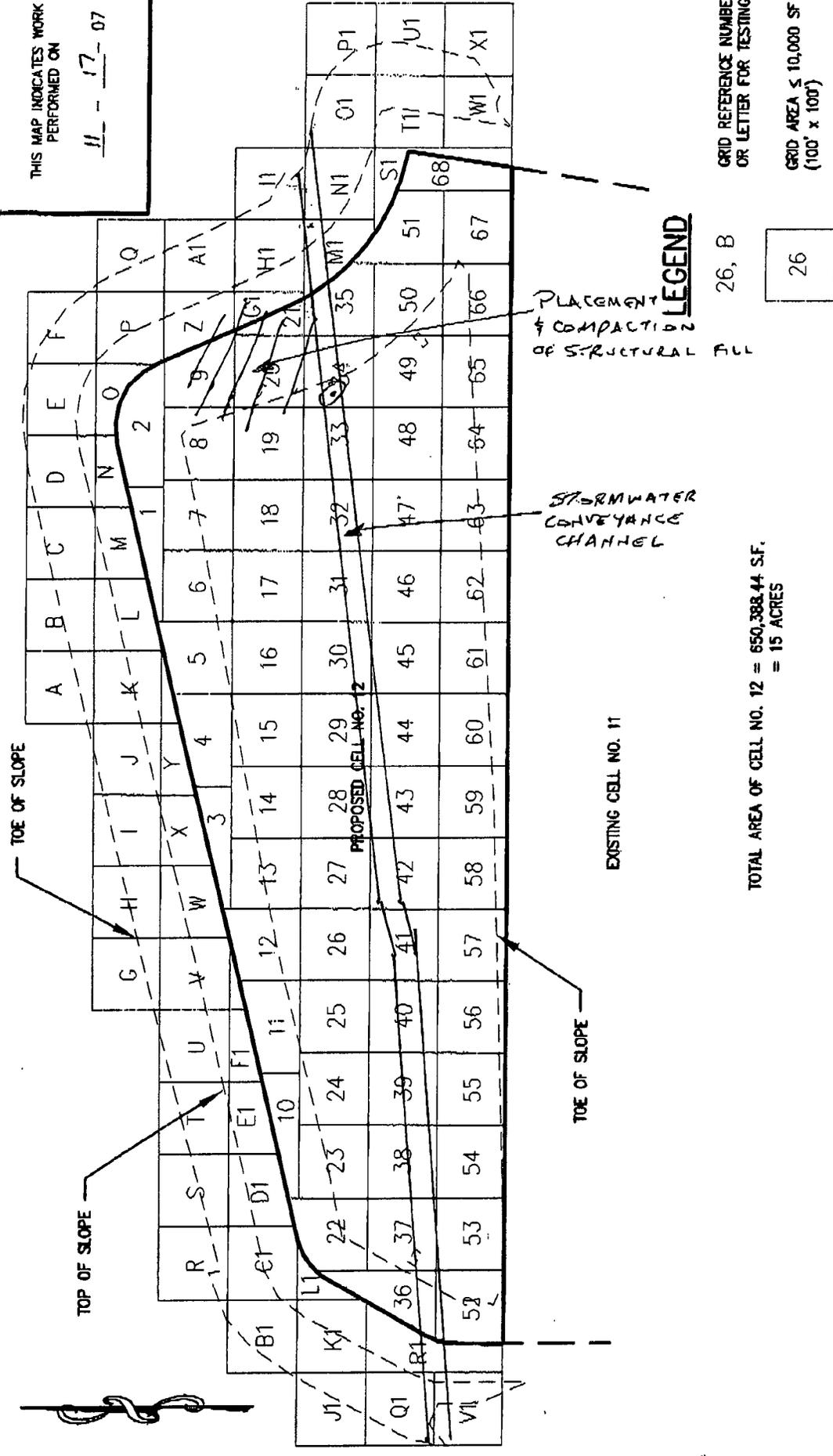
MONITORED PLACEMENT AND COMPACTION OF CLAYEY SOILS IN THE STORM WATER CONVEYANCE CHANNEL BACKFILL. PERFORMED ONE DRIVE CYLINDER DENSITY TEST.

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
11-17-07



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING  
26, B  
26  
GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
BURRELL-LAMBSON ENGINEERING, INC.  
804 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)226-1288 FAX: (864)226-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11/8-07  
 ARRIVAL TIME: 7:00 AM  
 DEPARTURE TIME: 5:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 10.0

PROJECT DAY NO. 14

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
FLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 37 °F  
 DAYTIME HIGH: 67 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

CONSTRUCTED WELL PAD FOR THE PROPOSED MONITORING WELL  
GW-16R.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

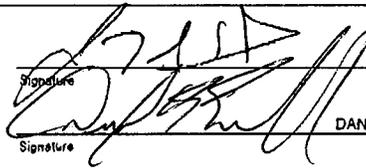
\*\* CONTRACTOR/CQA MEETING: CONTINUE FILL PLACEMENT IN THE LOW  
AREAS TO PROMOTE POSITIVE DRAINAGE IN THE CELL AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

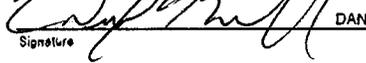
**TECHNICIAN ACTIVITIES:**

MONITORED CONSTRUCTION OF THE WELL PAD.  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:

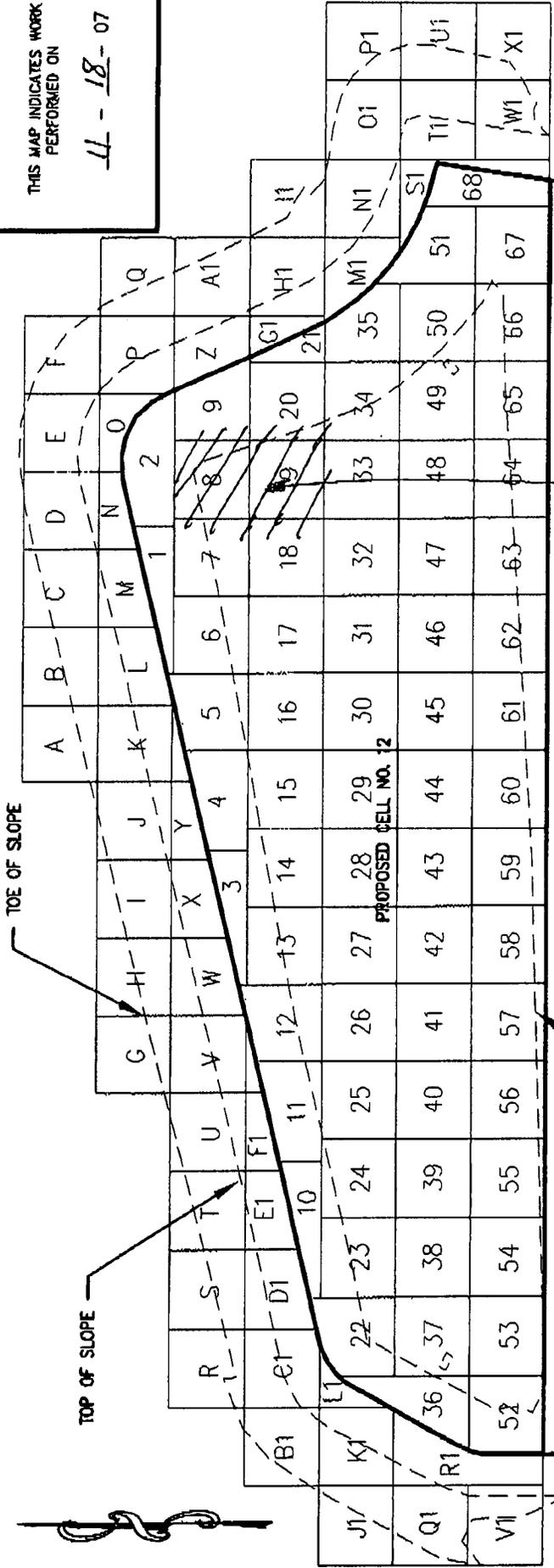
  
 Signature TEO STILES

RECORD REVIEWED & APPROVED BY:

  
 Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

11-18-07

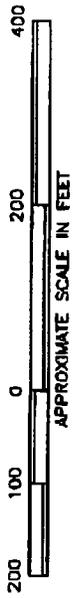


**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA ≤ 10,000 SF (100' x 100')

PLACEMENT & COMPACTION OF STRUCTURAL FILL

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	<p><b>IBLE</b>        BURNELL-JAMMONS ENGINEERING, INC.        604 POWERS COURT        GREENVILLE, SOUTH CAROLINA 29615        PHONE: (864) 255-1225 FAX: (864) 255-4430</p>	FIGURE
CHECKED: JAG	CAD: ECL58-FSC112		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: 407-1001-58		1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-19-07

PROJECT DAY NO. 15

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 120

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY AM WINDY  
PM ~~PERFECT~~ RAIN

TEMPERATURE:  
MORNING LOW: 46 °F  
DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

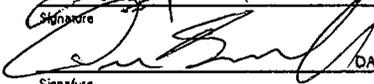
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
BLE DRILLERS ARE ON SITE. THEY ARE ABANDONING WELL  
GW-16.

\*\* CONTRACTOR/COA MEETING: CONTINUE FILL PLACEMENT IN LOW AREAS TO  
PREVENT WATER FROM PONDING OVER THE THANKSGIVING BREAK. BILL  
COOKSEY PRESENT AT DAILY MEETING.  
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

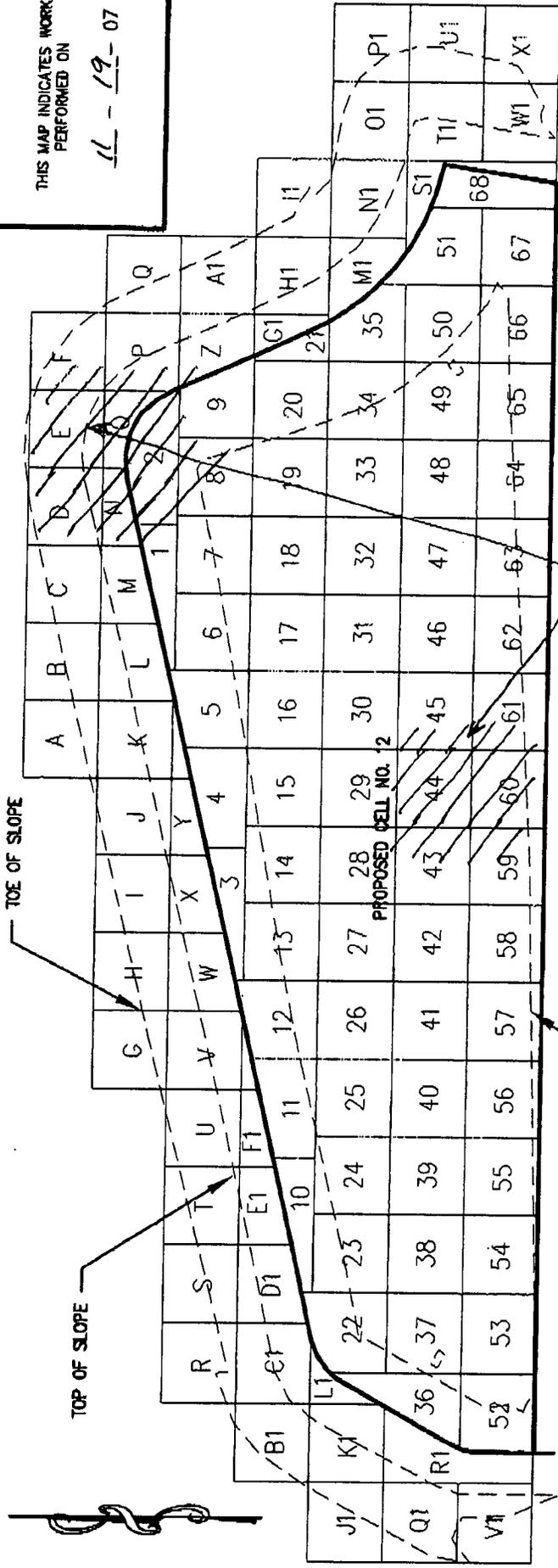
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR DRIVE CYLINDER DENSITY TESTS.  
VISITED POSSIBLE BORROW SOURCE FOR KZ10-2 SAND AND  
LEACHATE DRAINAGE STONE. COLLECTED THREE SAMPLES: SAND - ONE  
AT EXCAVATION AND ONE AFTER SCREENING, STONE - ONE AT THE  
ABOVE SAND SCREENING.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

11-19-07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

PLACEMENT & COMPACTION OF STRUCTURAL FILL

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF59-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**BLE**  
 BUNNELL-LAMMONS ENGINEERING, INC.  
 6004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)288-1255 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-20-07  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.0

PROJECT DAY NO. 16

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 48 °F  
DAYTIME HIGH: 73 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
BLE DRILLERS ARE ON SITE INSTALLING MONITORING WELL  
GW-16R.

\*\* CONTRACTOR/COA MEETING: CONTINUE FILL PLACEMENT TO PROMOTE  
POSITIVE DRAINAGE IN THE CELL. NO FILL PLACEMENT IS SCHEDULED  
FOR WEDNESDAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED SIX DRIVE CYLINDER DENSITY TESTS.

- MINIMAL WORK ON WEDNESDAY (BLADING AND ROLLING CELL AREA  
ONLY). BLE WILL BE OFF SITE UNTIL TUESDAY 11-27-07. CONTRACTOR  
IS SCHEDULED TO SWITCH CONSTRUCTION PERSONNEL ON MONDAY 11-26-07.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

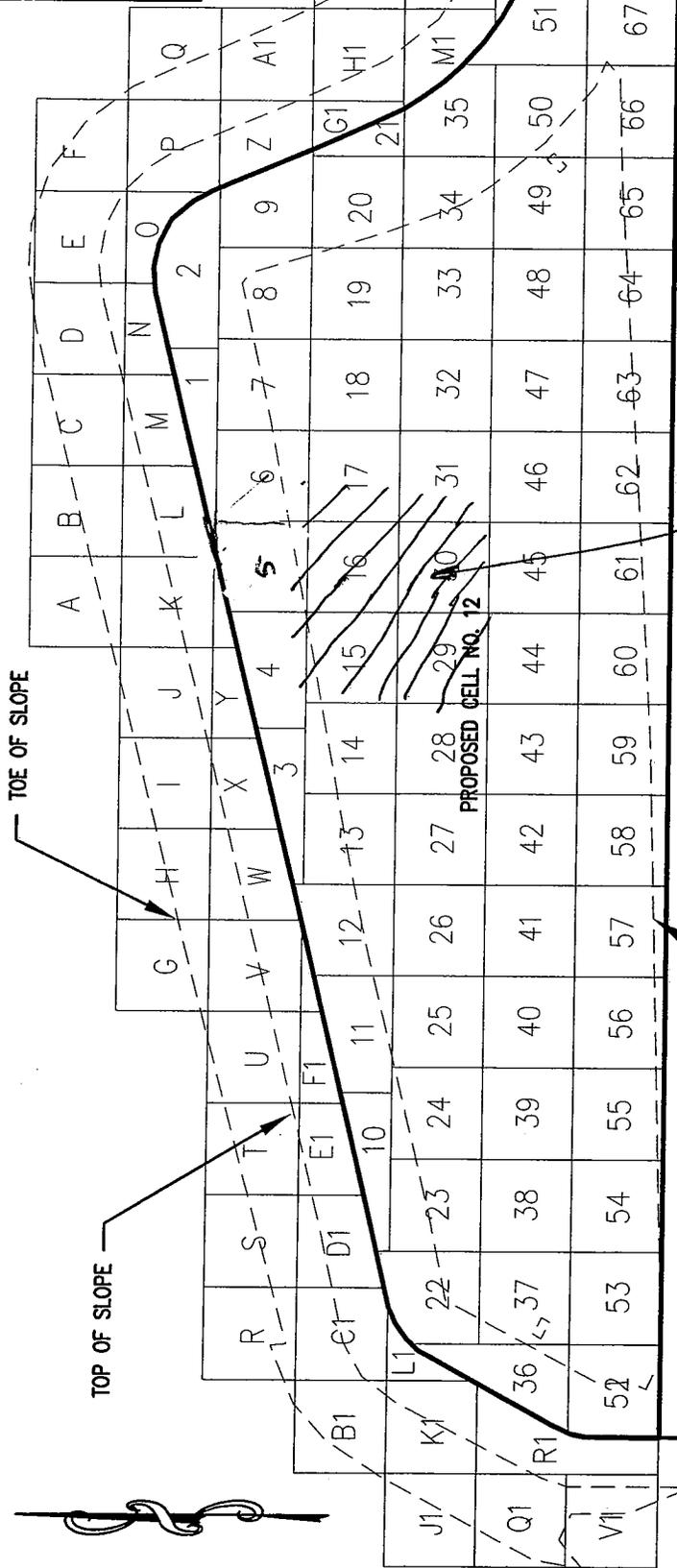
RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

11-22-07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



APPROXIMATE SCALE IN FEET

REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBL** INC.  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
6004 PONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-27-07

PROJECT DAY NO. 23

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 65 °F  
DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTING OF STRUCTURAL FILL. FILL PLACEMENT IS IN A MANNER TO PROMOTE POSITIVE STORMWATER DRAINAGE IN THE CELL. REMOVAL OF THE LITTER FENCE ALONG THE NORTH EDGE OF CELL 11 BY EAST CAROLINA LP PERSONNEL. STRIPPING TOPSOIL IN THE EAST END OF THE TRIPP PROPERTY BORROW AREA. THE MATERIAL IS BEING STOCKPILED IN THE BORROW AREA.

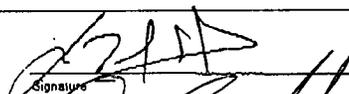
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED EIGHT NUCLEAR DENSITY TESTS AND ONE CALIBRATION DRIVE CYLINDER.

\* CONTRACTOR/CPA MEETING: CONTRACTOR MAY CONSTRUCT WEST END TO FIRST GRADE AND CUT TRENCH THROUGH BERM FOR STORM WATER DRAINAGE.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:

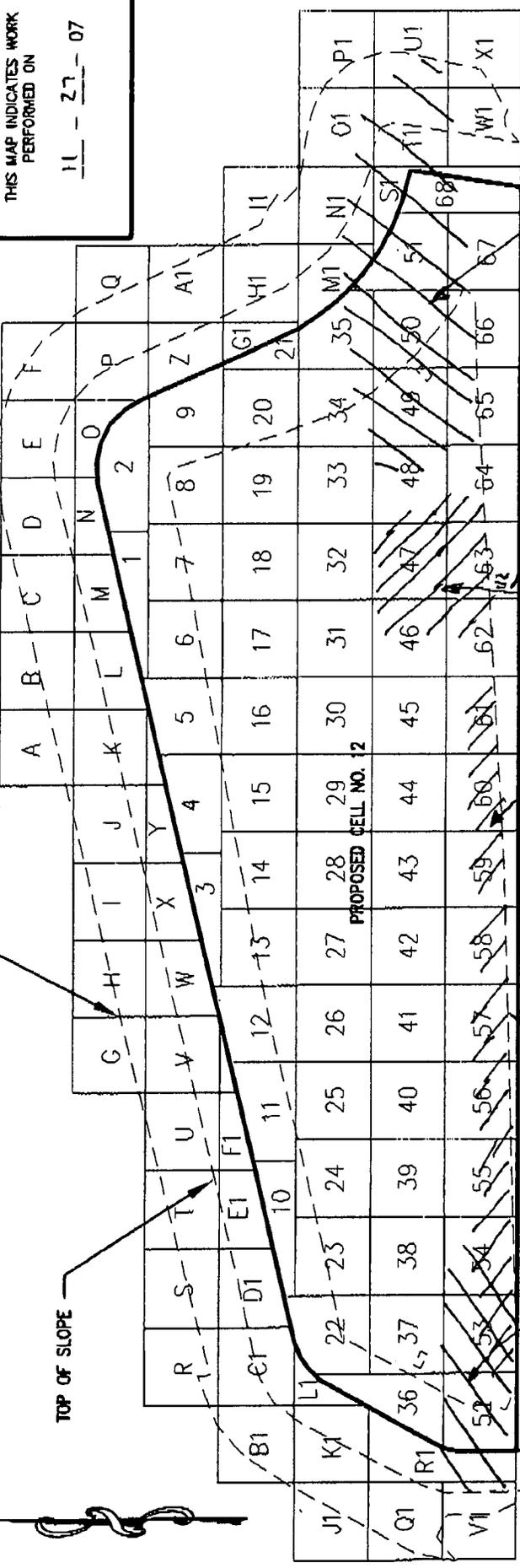


DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 11-27-07

TOE OF SLOPE

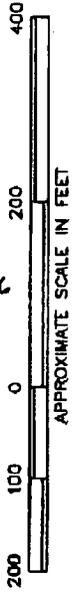
TOP OF SLOPE



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING  
26, B  
GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIGURE: 1
CHECKED: JAG	CAD: ECLF58-FSCCELL12	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED: J07-1001-58	JOB NO: J07-1001-58	IBL INC. RUMMEL-LAMARCA ENGINEERING, INC. 8004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)288-1285 FAX: (864)288-4490

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-28-07

PROJECT DAY NO. 24

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER:  SUNNY CLOUDY WINDY  
 PTLY CLOUDY  RAIN

TEMPERATURE: 30 °F  
MORNING LOW: 30 °F  
DAYTIME HIGH: 60 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL. FILL IS BEING PLACED IN A MANNER TO PROMOTE STORMWATER DRAINAGE IN THE CELL. A LAYER OF GRAY, CLAYEY SILT ENCOUNTERED IN THE BORROW PIT. THIS MATERIAL HAS BEEN PLACED IN THE FILL AREA IN THE EXTERIOR SLOPE OF THE ACCESS ROAD.

STRIPPING TOPSOIL IN THE EAST END OF THE TRIPP PROPERTY BORROW AREA. THIS MATERIAL IS BEING PLACED AROUND THE PERIMETER OF THE BORROW AREA FOR USE ON THE FINISHED SLOPES.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

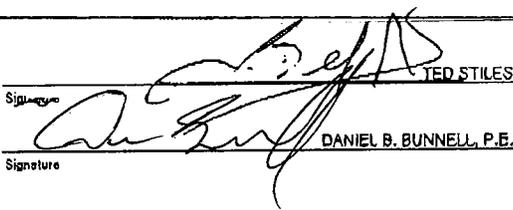
TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED FIVE NUCLEAR DENSITY TESTS AND ONE CALIBRATION DRIVE CYLINDER.

\*\* CONTRACTOR/COA MEETING: (SAFETY MEETING). COA TECH. ATTENDED

RECORD PREPARED BY:

Signature

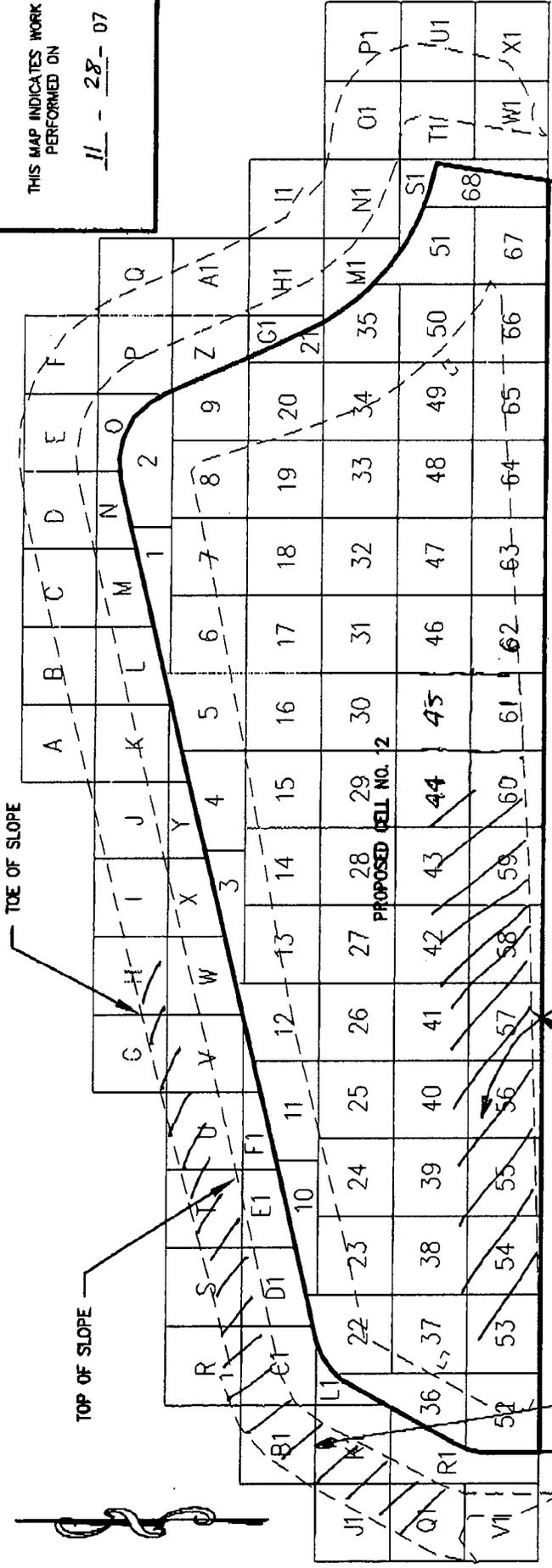
  
TED STILES

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 11 - 28 - 07

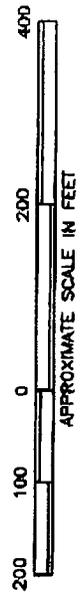


**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.



PLACEMENT AND COMPACTION OF STRUCTURAL FILL

PLACEMENT OF GRAY CLAYEY SILT

DRAWN: AEH	DATE: 11-01-07	<p><b>IBLE</b> INC.          BURSSELL-LAMMONS ENGINEERING, INC.          604 POWERS COURT 28615          GREENVILLE SOUTH CAROLINA          PHONE: (864)288-1285 FAX: (864)288-4430</p>	FIGURE	
CHECKED: JAG	CAD: ECLF58-FSC112		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	<b>1</b>
APPROVED:	JOB NO: J07-1001-58			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11/29/07

PROJECT DAY NO. 25

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

ROY HOFFMAN, P.E. w/ REPUBLIC

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 43 °F  
DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL. FILL PLACEMENT IS BEING PLACED WEST OF THE HIGH POINT IN CELL 12.

MAINTENANCE OF THE BORROW AREA AS EXCAVATION PROGRESSES.

STRIPPING TOPSOIL IN THE TRIPP PROPERTY BORROW AREA.

\*\* CONTRACTOR/CQA MEETING: AWAITING SECOND TRACKHOLE TO BEGIN DEWATERING ACTIVITY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY:



TED STILES

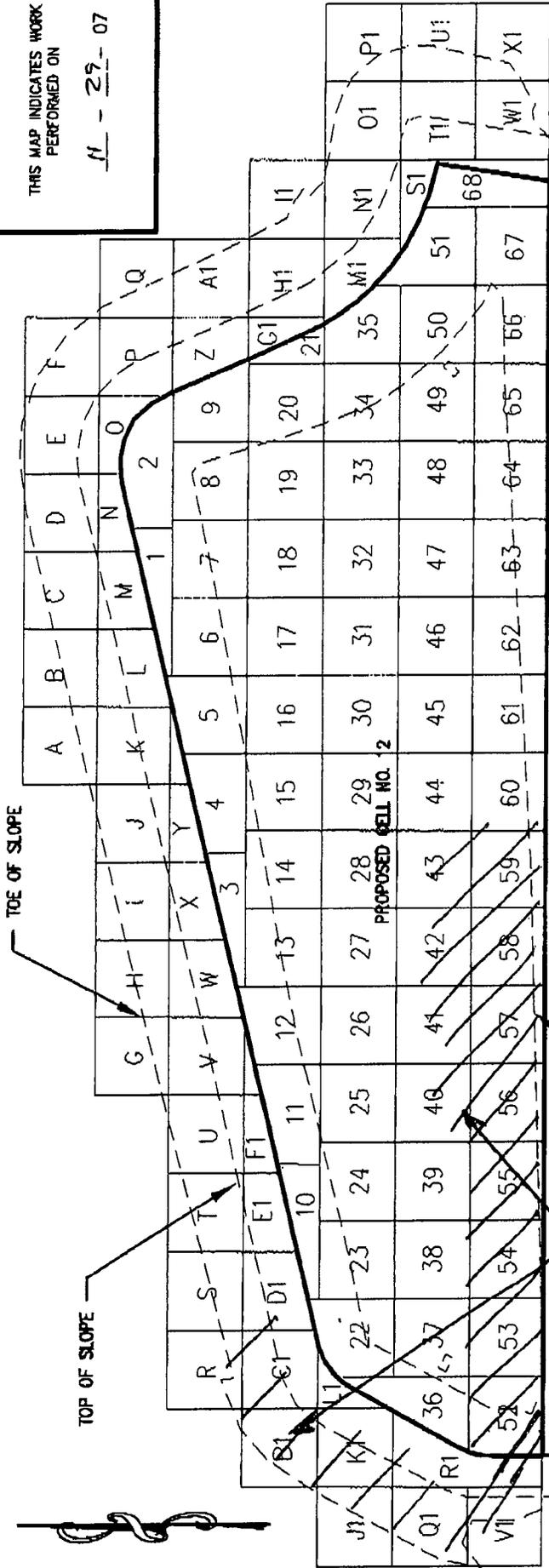
RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

N - 29 - 07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

EXISTING CELL NO. 11

PLACEMENT AND COMPACTION OF STRUCTURAL FILL



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	 <b>BUNNELL-LAWSONS ENGINEERING, INC.</b> 804 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE (864)286-1285 FAX (864)286-4430	FIGURE
CHECKED: JAG	CAD: ECLFS8-FSCCELL12		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: 107-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-3-07

PROJECT DAY NO. 29

ARRIVAL TIME: 8:00 AM

DEPARTURE TIME: 4:30 PM

LUNCH BREAK: .5

WORK HOURS: 8.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 62 °F  
DAYTIME HIGH: ↓ °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL

COMPACTED CLAY LINER  
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

EXCAVATION AND STOCKPILE OF CLAY LINER MATERIAL. THE  
STOCKPILE AREA HAS BEEN EXTENDED 100'-0" TO THE NORTH.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ACTIVITY IN THE BORROW AREA.

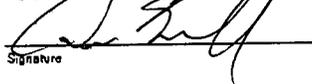
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RECORD PREPARED BY:

  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC., PROJECT NO. J07-1001-56

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-4-07

PROJECT DAY NO. 30

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 37 °F  
DAYTIME HIGH: 54 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
DISCING THE IN PLACE FILL IN THE CELL FLOOR. THIS  
AREA IS AT APPROXIMATE SUBGRADE.  
RECEIVED A CAT. 330 TRACK HSE. PERFORMING DEWATERING ACTIVITY  
IN THE EAST HALF OF THE TRIPP PROPERTY BORROW AREA.  
\*\* CONTRACTOR/CQA MEETING: CONTINUE STRUCTURAL FILL PLACEMENT ON  
THE WEST END OF CELL 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER  
CALIBRATION.  
VISITED OFF SITE BORROW SOURCE FOR THE WASHED SAND PROTECTIVE  
COVER AND DRAINAGE STONE.

RECORD PREPARED BY:



TED STILES

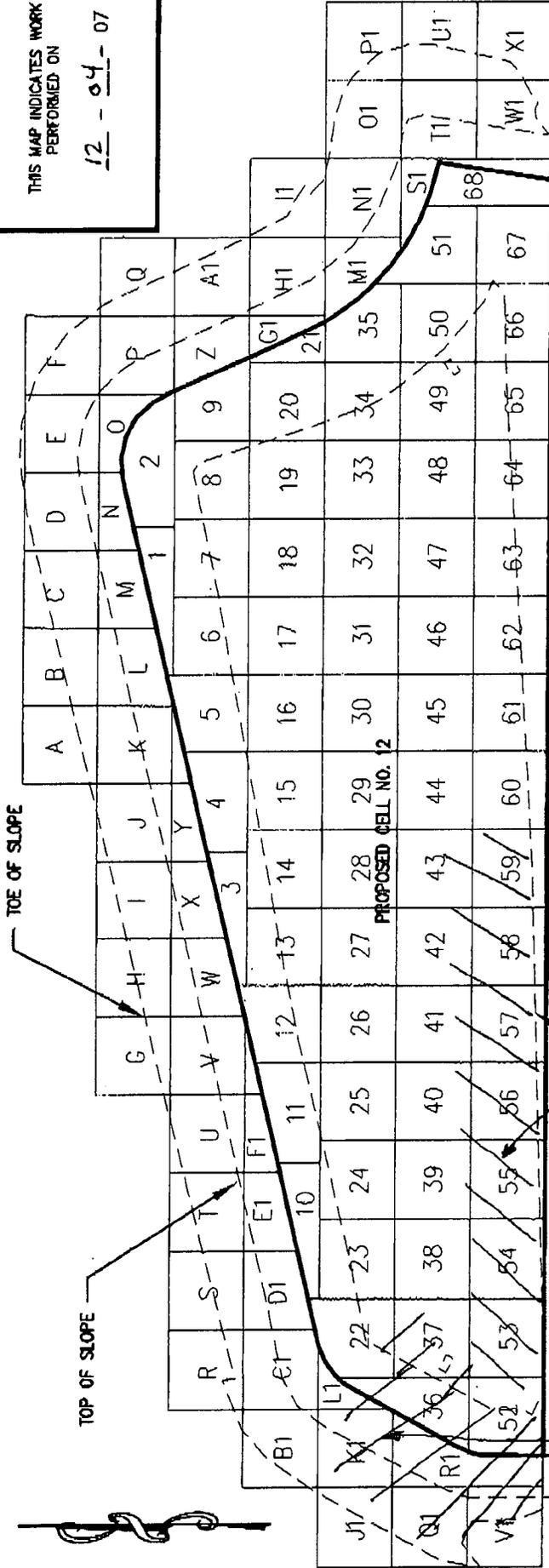
RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12 - 04 - 07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

REFERENCE:

DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.



DATE:	11-01-07	<p><b>IBLE</b> INC.</p> <p><b>SUMMEL-LAMBSON ENGINEERS, INC.</b> 8004 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)289-1285 FAX: (864)289-4430</p>	FIGURE	<p><b>1</b></p>
CAD:	ECLF58-FSCCELL12		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
JOB NO:	J07-1001-58			

PLACEMENT AT COMPACTION OF STRUCTURAL FILL

DISCING THE IN PLACE FILL

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-6-07

PROJECT DAY NO. 32

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

JEFF HOLVOY, P.E.

MATT CHEEK, P.E., H.H.N. & T.  
SCOTT NEWMAN R.B. BAKER

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 35 °F  
DAYTIME HIGH: 45 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL

COMPACTED CLAY LINER  
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

CONSTRUCTION PROGRESS MEETING ON SITE.

EXCAVATION OF DEWATERING TRENCH IN THE EAST END OF THE  
TRIPP PROPERTY BORROW AREA. THE SATURATED EXCAVATED MATERIAL HAS  
BEEN PLACED IN A THIN LIFT ACROSS THE CELL FLOOR. THIS MATERIAL  
WILL BE DISCED TO AID IN DRYING.

RECEIVED 102 ROLLS OF GEOTEXTILE 459,000 SF. THE MATERIAL IS  
PROPEX GEOTEX, ITEM # 1008170, LOT # 403043. (PROJECT REQUIREMENTS  
MIN. 6 OZ TEXTILE BENEATH THE NATIVE SOIL COVER.)

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

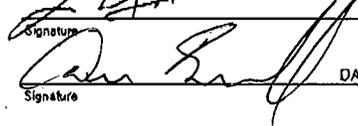
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY:



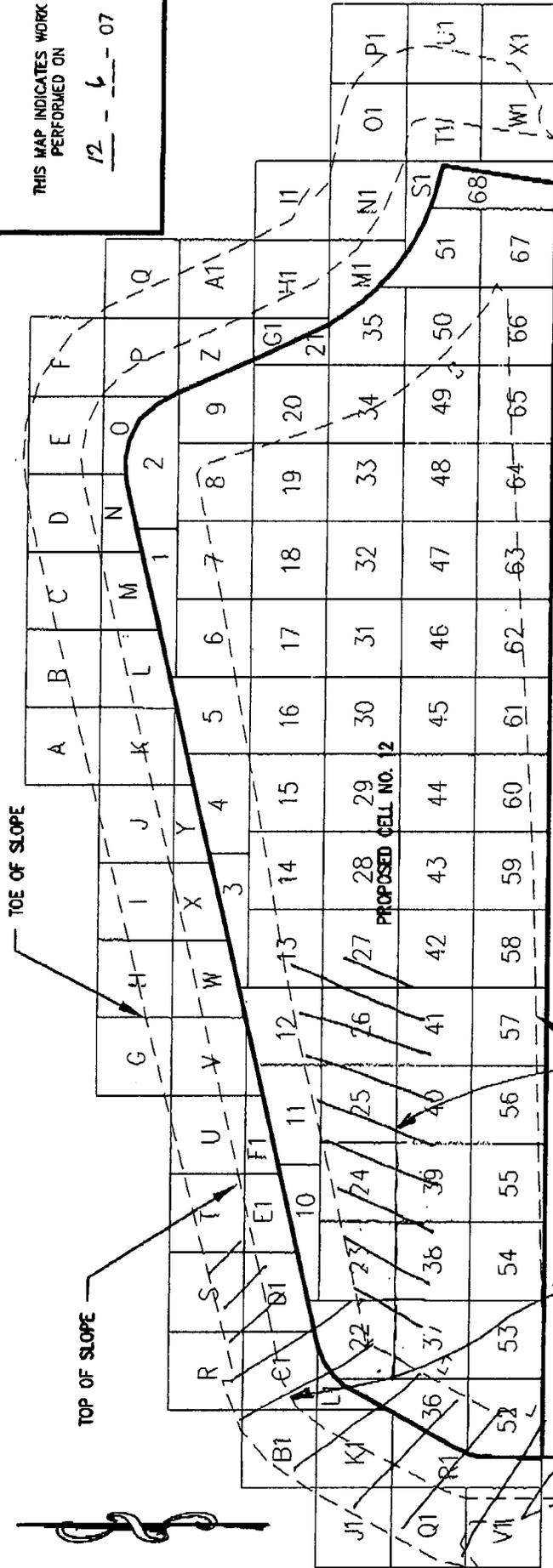
TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 12 - 6 - 07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07	<p><b>IBLE</b> INC. BUNNELL-LAMBSONS ENGINEERING, INC. 604 FOREST COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)268-1215 FAX: (864)268-4430</p>	FIGURE	1
CHECKED:	JAG		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
APPROVED:	J07-1001-58			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-5-07

PROJECT DAY NO. 31

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY

FLY CLOUDY  
LATE PM  
RAIN

TEMPERATURE:  
MORNING LOW: 37 °F  
DAYTIME HIGH: 55 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
THE DISCED IN PLACE FILL HAS BEEN SEALED DUE TO  
FORECAST RAIN.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER  
CALIBRATION.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

DANIEL B. BUNNELL, P.E.





**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF PROJECT MEETING**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Meeting Date:** December 6, 2007

**Meeting Attendees:**

<u>NAME</u>	<u>FIRM</u>	<u>PHONE</u>
Mr. Bill Cooksey	East Carolina Landfill	(252) 348-3322
Mr. Matt Cheek, P.E.	HHNT, Inc.	(912) 743-7175
Mr. Jeff Helvey, P.E.	BLE, Inc.	(864) 346-9882
Mr. Ted Stiles	BLE, Inc.	(864) 201-5517
Mr. Scott Newman	R.B. Baker Construction	(912) 657-9336
Mr. Timmy Lee	R.B. Baker Construction	(912) 667-2268

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The meeting was held in the offices of East Carolina Environmental. The primary purpose of the site meeting was to review the Tripp Property Borrow Area Soil Management Plan. This portion of the meeting was directed by Mr. Jeff Helvey, P.E. Comments and suggestions were provided by the meeting attendees and are summarized in the following paragraphs. The construction progress portion of the meeting was directed by Mr. Matt Cheek, P.E. and Mr. Helvey.

**I. TRIPP PROPERTY BORROW AREA MANAGEMENT PLAN:**

Borrow soils are available in the previously unexcavated portion of the Tripp Property Borrow Area. The available borrow soils exist generally in the middle of the borrow area to the eastern edge. The proposed borrow soils were previously evaluated in the Bunnell-Lammons Engineering subsurface exploration report titled *Soil Borrow Management Plan; Tripp Property* dated June 17, 2005. The available borrow soils consist of, in descending order from the ground surface, compacted clay liner borrow, structural fill borrow, and native sand protective cover borrow soil.

- A. Clay Liner Borrow Soils: The clay liner borrow soils (permeability,  $k$ , less than or equal to  $1 \times 10^{-7}$  cm/s) exist in the uppermost soil layer beneath previously stripped topsoil (Layer I clays). The soils suitable for use in the clay liner are approximately 5 feet thick in the middle section of the borrow area increasing in thickness to approximately 8 feet on the east side of the borrow area. The clay liner borrow soils are currently being excavated and stockpiled southwest of the Tripp Property Borrow Area.

- B. Structural Fill Borrow Soils: The structural fill borrow soils exist beneath the clay liner borrow soils in a layer 8 feet thick in the middle section of the borrow area decreasing in thickness to 5 feet on the east side. These soils are upper soils in the soils referred to as Layer II in previous reports of subsurface conditions at the East Carolina Landfill.
- C. Native Sand Protective Cover: The native sand protective cover soil (permeability,  $k$ , greater than or equal to  $1 \times 10^{-3}$  cm/s) exists beneath the structural fill borrow soils in a layer approximately 11 feet thick in the middle of the borrow area and increase in thickness to greater than 18 feet on the east side of the borrow area. These soils are referred to as Layer III in previous reports of subsurface conditions at the East Carolina Landfill.
- D. Dewatering: R.B. Baker is currently pumping water from the western end of the borrow area. The water discharges to the southwest and ultimately drains to sediment ponds on the west side of the landfill. No water may be discharged on the eastern half of the Tripp Property Borrow Area. However, dewatering the eastern end on the borrow area is limited to approximately 8 feet below the ground surface if the water is drawn down from the west end. This is due to a "gumbo clay bubble" in the middle of the borrow area 8 feet below the ground surface that will not allow ground water flow from the east to the west below this depth. Excavating a ditch through this bubble would potentially result in the entrance road into the borrow area having to be moved. In order to effectively dewater the eastern portion of the borrow area, a second pump (provided by Republic Services of N.C.) will be installed at the east end of the borrow area. The pump will discharge into a surface ditch which will be excavated to direct water to the west and ultimately into sediment ponds to the west of the landfill cells. All discharge points are to be stone lined and filtered basins.
- E. General Borrow Soils Excavation: Borrow soils are to be excavated in an orderly manner. All usable soils are to be exhausted prior to moving to another section of the borrow area.
- F. Completion of Borrow Area Excavation: At the completion of excavating soils from the borrow area, dressing of slopes is required. Clayey soil berms should be placed at the exposed edge of the remaining protective cover borrow soils and extend approximately 3 feet above the groundwater elevation. Another clayey soil berm should extend across the borrow area (north-south) at the "gumbo clay bubble" to allow landfill personnel to more efficiently dewater sections of the borrow area.
- G. Surveying: Baker requested that Tommy Fields mark the boundary of the borrow area.

- H. Erosion and Sediment Controls: Mr. Cooksey noted that silt fence should be installed around the clay liner stockpile and on the north side of the borrow area where a temporary topsoil stockpile is located. Mr. Cooksey indicated that East Carolina has silt fence that can be used by Baker.

## II. SCHEDULE:

- A. Clay Liner: Baker requested that they be allowed to complete the subgrade in the western portion of Cell No. 12 and begin placing clay liner. The purpose of beginning clay liner placement is to reduce the amount of clay liner stockpiling while they expose the underlying structural fill soils in the borrow area. Baker anticipates having this portion of the subgrade ready for an as-built survey to be performed after the January 1, 2008. Mr. Cheek noted that it has been anticipated that the as-built survey over the entire cell for each layer would require two days to complete and that two mobilizations per layer would most likely be approved by Republic Services of North Carolina.
- B. Holiday Schedule: Baker currently plans to shut-down from December 22 through December 28, 2007.
- C. Corps of Engineers: Baker will be notified prior to any scheduled visits.

## III. MATERIALS:

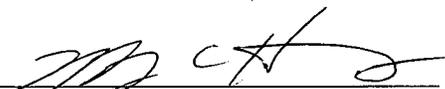
- A. Geomembrane: Has been manufactured and could be delivered prior to December 22, 2007.
- B. GCL: A minimum of 6 rolls (2,250 sf each) will be needed for the sumps. The GCL will be stored in the Recycling Building.
- C. Leachate Pipe: Baker has ordered the pipe and expects the pipe to be delivered before December 31, 2007.
- D. Leachate Collection System Drainage Geotextile: Nominal 8-oz geotextile has been ordered by Republic Services of North Carolina (note that 6-oz minimum is required).
- E. Protective Cover Sand: The washed sand source has been approved and delivery is expected to begin the December 12, 2007. Mr. Cooksey indicated that the hauler expects to deliver 1,800 tons per day. Approximately 9,200 tons are required.



**IV. CONSTRUCTION ISSUES**

- A. The plastic pipe beneath the roadway near the "old house" may need additional cover to handle delivery truck traffic. Mr. Cooksey directed the Operations Manager to inspect the pipe.
- B. Delivery trucks will be routed through the construction entrance road. Trimming of overhanging branches may be required.
- C. Stockpile locations have been selected and are approved by Mr. Cooksey.

Respectfully submitted:

  
\_\_\_\_\_  
Jeffrey C. Helvey, P.E.  
Project Engineer

Distribution: Meeting Attendees  
Mr. Ray Hoffman, P.E.  
Mr. Steve Nichting  
Mr. Bill Hodges, P.E.  
Mr. Dan Bunnell, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-7-07

PROJECT DAY NO. 33

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 33 °F  
DAYTIME HIGH: 57 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMING DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW  
AREA.  
RECEIVED 7 ROLLS OF GEOTEXTILE. A TOTAL OF 109 ROLLS OF  
GEOTEXTILE ON SITE.

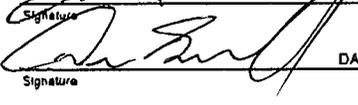
\*\* CONTRACTOR/COA MEETING: CONTINUE FILL PLACEMENT ON THE WEST END.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND/OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY:  TED STILES

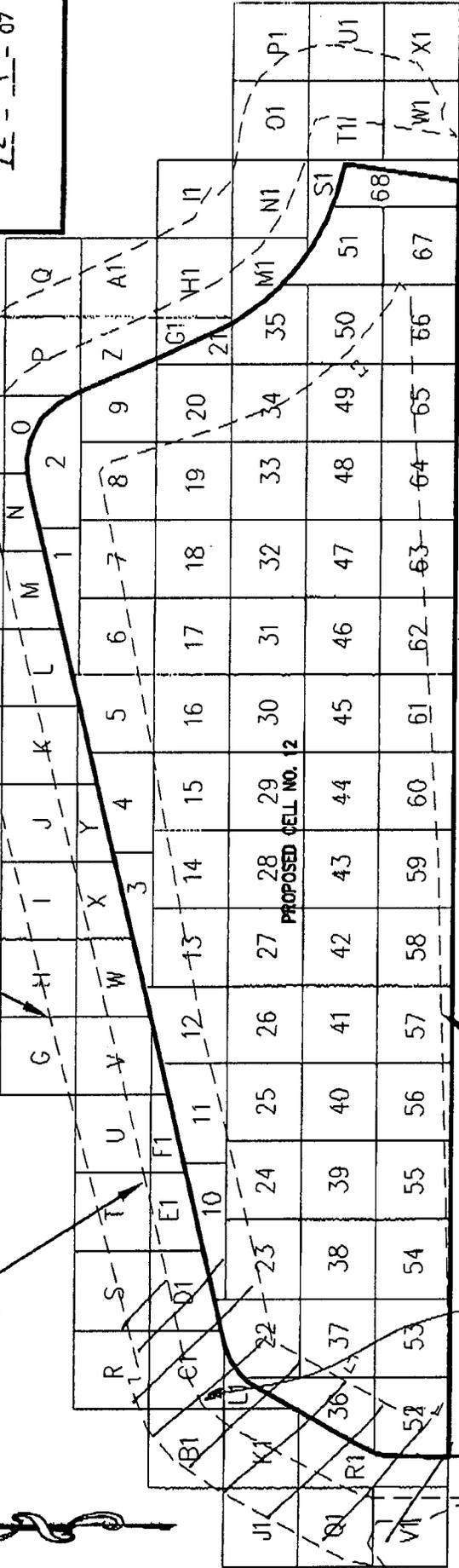
RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12-7-07

TOE OF SLOPE

TOP OF SLOPE



EXISTING CELL NO. 11

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07
DRIVER:	AEH
CHECKED:	JAG
APPROVED:	J07-1001-58
CAD:	ECLF58-FSC12
JOB NO:	J07-1001-58
<b>IBLE</b> INC. BURNELL-LAMBSON ENGINEERING, INC. 804 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (854)258-1225 FAX: (854)258-4430	
FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
FIGURE	<b>1</b>

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-8-07

PROJECT DAY NO. 34

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: 1.5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

TEMPERATURE:

WEATHER: SUNNY CLOUDY WINDY

PTLY CLOUDY

RAIN

MORNING LOW: 43 °F

DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION

COMPACTED CLAY LINER

STRUCTURAL FILL

LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMING DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW  
AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
FOUR NUCLEAR DENSITY TESTS AND ONE TRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:

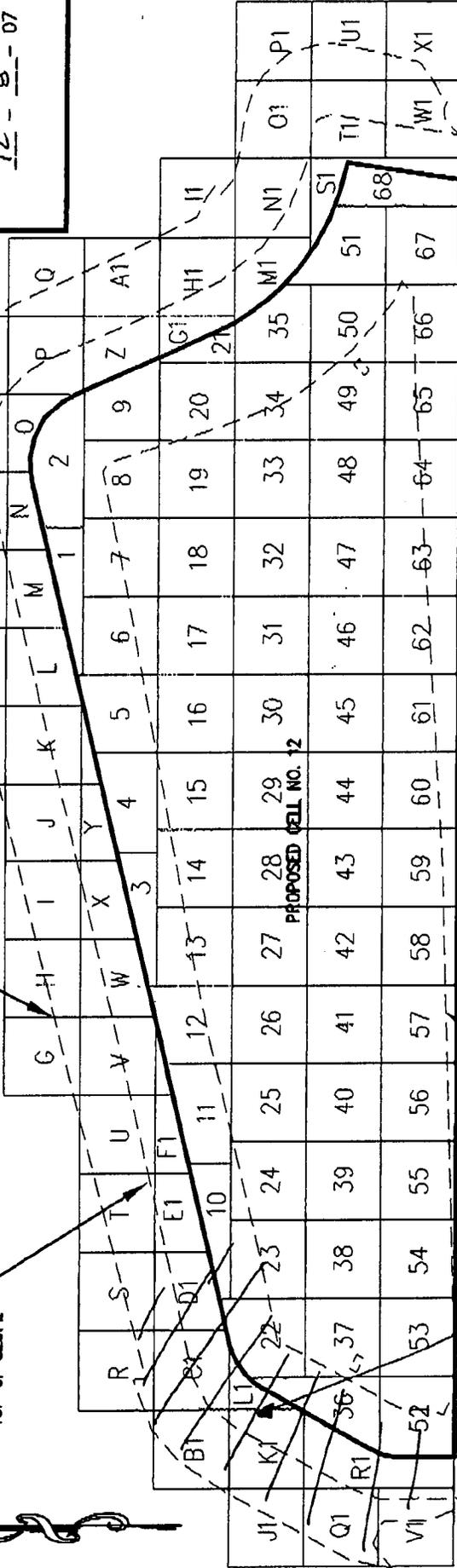


DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 12 - B - 07

TOE OF SLOPE

TOP OF SLOPE



EXISTING CELL NO. 11

**LEGEND**

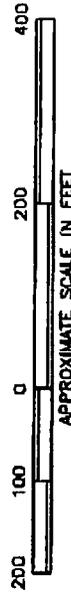
26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIGURE: 1
	CAD: ECU58-FSC12	
	JOB NO: J07-1001-58	
CHECKER: JAG	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
APPROVED:	 <b>BURNELL-LAMMONS ENGINEERING, INC.</b> 6104 FONDERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)288-1285 FAX: (864)288-4430	



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-9-57

PROJECT DAY NO. 35

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:

NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY PM  
AM PLY CLOUDY CLOUDY WINDY RAIN

TEMPERATURE: MORNING LOW: 43 °F  
DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL

COMPACTED CLAY LINER  
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
EXCAVATION OF ~~THE~~ STRUCTURAL FILL MATERIAL IN THE WEST  
HALF OF THE TRIPP PROPERTY BORROW AREA.  
DISCING IN PLACE FILL, AT SUBGRADE, IN THE CELL FLOOR.  
STRIPPING AREA NORTH OF THE CLAY LINER MATERIAL STOCKPILE.  
THIS AREA IS DESIGNATED FOR STOCKPILING THE WASTED PROTECTIVE  
COVER AND DRAINAGE STONE MATERIALS.

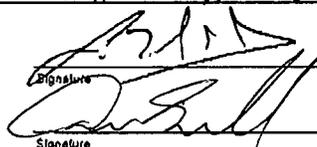
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL  
FILL. PERFORMED SIX NUCLEAR DENSITY TESTS AND  
ONE DRIVE CYLINDER CALIBRATION.  
MONITORED ACTIVITY IN TRIPP PROPERTY BORROW AREA.

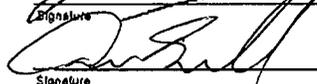
\*X CONTRACTOR/COA MEETING: THIS WEEK COMPLETE DEWATERING TRENCH AND  
PLACEMENT OF RIPRAP AT DSECHARGE AREAS. SHOULD BEGIN DAILY DEWATERING ACTIVITY.

RECORD PREPARED BY:

  
Signature

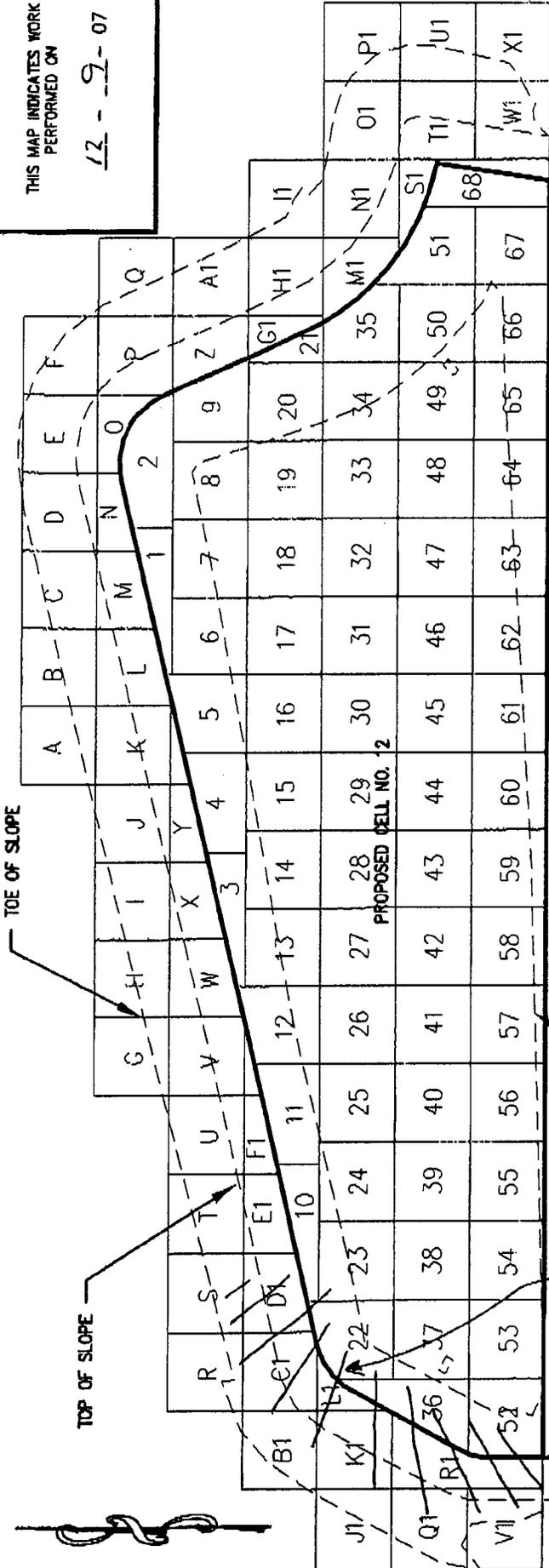
TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 12-9-07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
 6004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, MARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-10-07  
 ARRIVAL TIME: 7:00 AM  
 DEPARTURE TIME: 5:30 PM  
 LUNCH BREAK: 15  
 WORK HOURS: 10.0

PROJECT DAY NO. 36

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

VISITORS:  
 NAME REPRESENTING

WEATHER: SUNNY CLOUDY WINDY  
 PITY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 54 °F  
 DAYTIME HIGH: 77 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
DEWATERING ACTIVITY IN THE BORROW AREA. EXCAVATION OF THE  
RIM DITCH AND TEMPORARY DRAINAGE DITCH ALONG THE SOUTHERN  
EDGE OF THE TRIPP PROPERTY BORROW AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER CALIBRATION.  
DEVELOPING GROUNDWATER MONITORING WELL, GW-16R. THREE WATER  
SAMPLES COLLECTED.

RECORD PREPARED BY: TED STILES

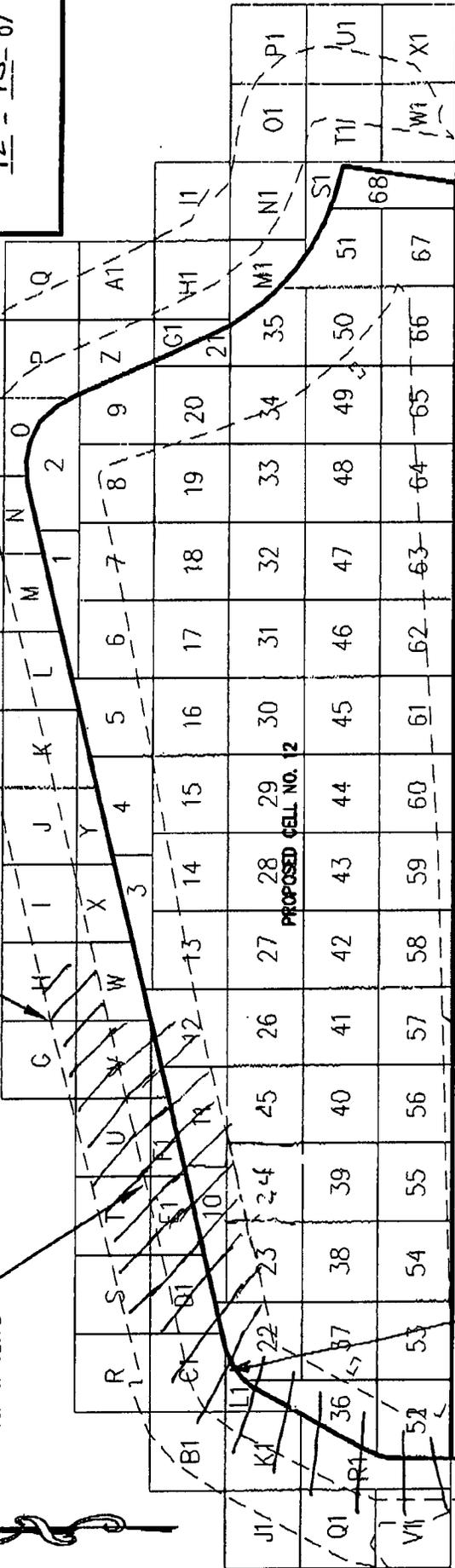
RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12 - 12 - 07

TOE OF SLOPE

TOP OF SLOPE



EXISTING CELL NO. 11

PLACEMENT OF  
COMPACTION OF  
STRUCTURAL FILL

**LEGEND**

26, 8

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBEN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH

DATE: 11-01-07

CHECKED: JAG

CAD: ECLF58-FSCCELL12

APPROVED:

JOB NO: J07-1001-58

**BLE**  
BURRELL-LAMONS ENGINEERING, INC.  
8004 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)259-1265 FAX: (864)259-4439

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-66

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-11-07  
 ARRIVAL TIME: 7:00 AM  
 DEPARTURE TIME: 6:00 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 10.5

PROJECT DAY NO. 37

VISITORS:  
 NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
 PTLY CLOUDY  RAIN  FOG  AM/PM

TEMPERATURE: FIRECAST  
 MORNING LOW: 55 °F }  
 DAYTIME HIGH: 78 °F } ACTUAL HIGH 64

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
EXCAVATION OF THE RIM DITCH IN THE EAST END OF THE TRIPP  
PROPERTY BORROW AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

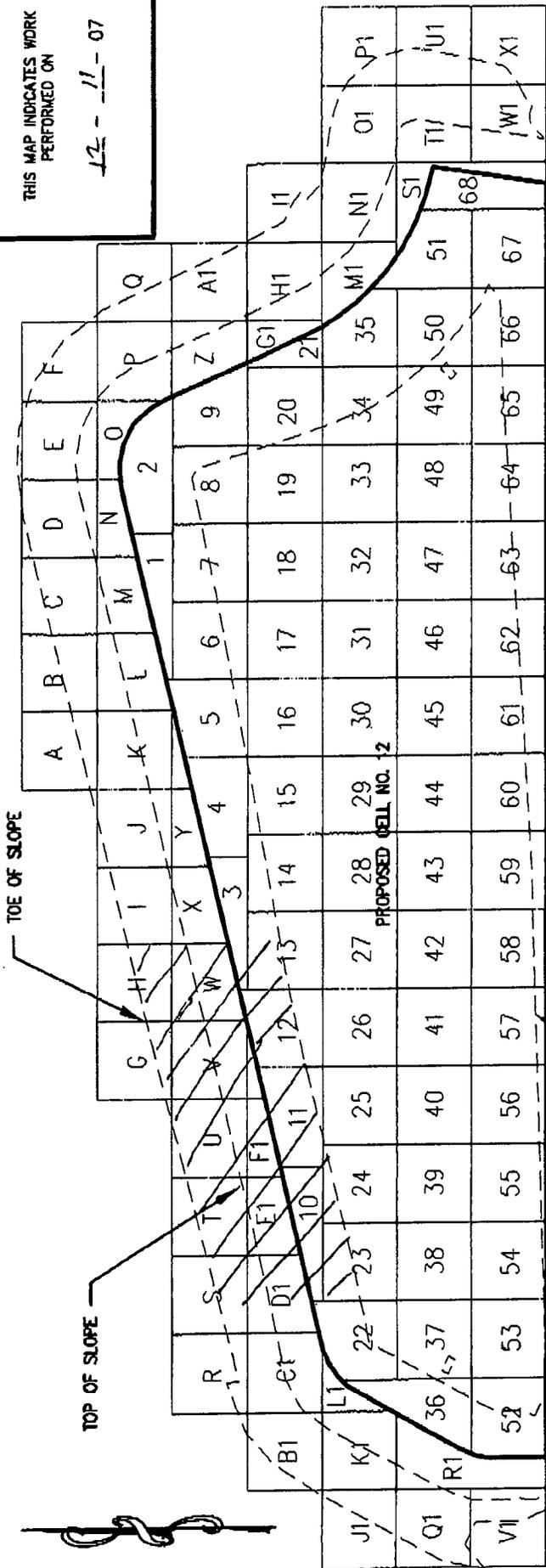
**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER CALIBRATION  
COLLECTED SEVEN SAMPLES OF GEOTEXILE. THE SAMPLES  
HAVE BEEN SHIPPED TO PGL FOR CONFORMANCE TESTING.  
DEVELOPING GROUND WATER MONITORING WELL GW-16R. COLLECTED  
TWO WATER SAMPLES.

RECORD PREPARED BY: \_\_\_\_\_ TED STILES

RECORD REVIEWED & APPROVED BY: \_\_\_\_\_ DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 12-11-07



**LEGEND**

26, B  
GRID REFERENCE NUMBER OR LETTER FOR TESTING

26  
GRID AREA ≤ 10,000 SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



TOE OF SLOPE  
PLACEMENT & COMPACTION OF STRUCTURAL FILL

DRAWN: AEH	DATE: 11-01-07	FIGURE: 1
CHECKED: JAG	CAD: ECLF58-FSCCELL12	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: J07-1001-58	

**IBL**  
BUNNELL-LAMBSON ENGINEERING, INC.  
6004 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1265 FAX: (864)288-4439

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-12-07

PROJECT DAY NO. 38

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:

NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES

WEATHER: (SUNNY) CLOUDY (WIND)  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 61 °F  
DAYTIME HIGH: 81 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL

COMPACTED CLAY LINER  
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PLACEMENT OF RIPRAP IN THE DISCHARGE TRENCHES AT THE  
TRIPP PROPERTY BORROW AREA. R.B. BAKER HAS STARTED THE  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROWS AREA.  
DIXING IN PLACE FILL AT SUBGRADE IN THE CELL FLOOR.

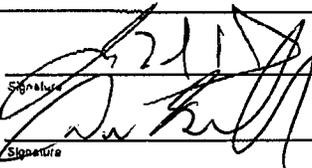
\* CONTRACTOR/COA MEETING: CONTINUE FILL PLACEMENT AT THE WEST  
END OF CELL 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER  
CALIBRATION.  
COLLECTED INITIAL WATER SAMPLE AFTER PURGING GROUND WATER  
MONITORING WELL GW-16R.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



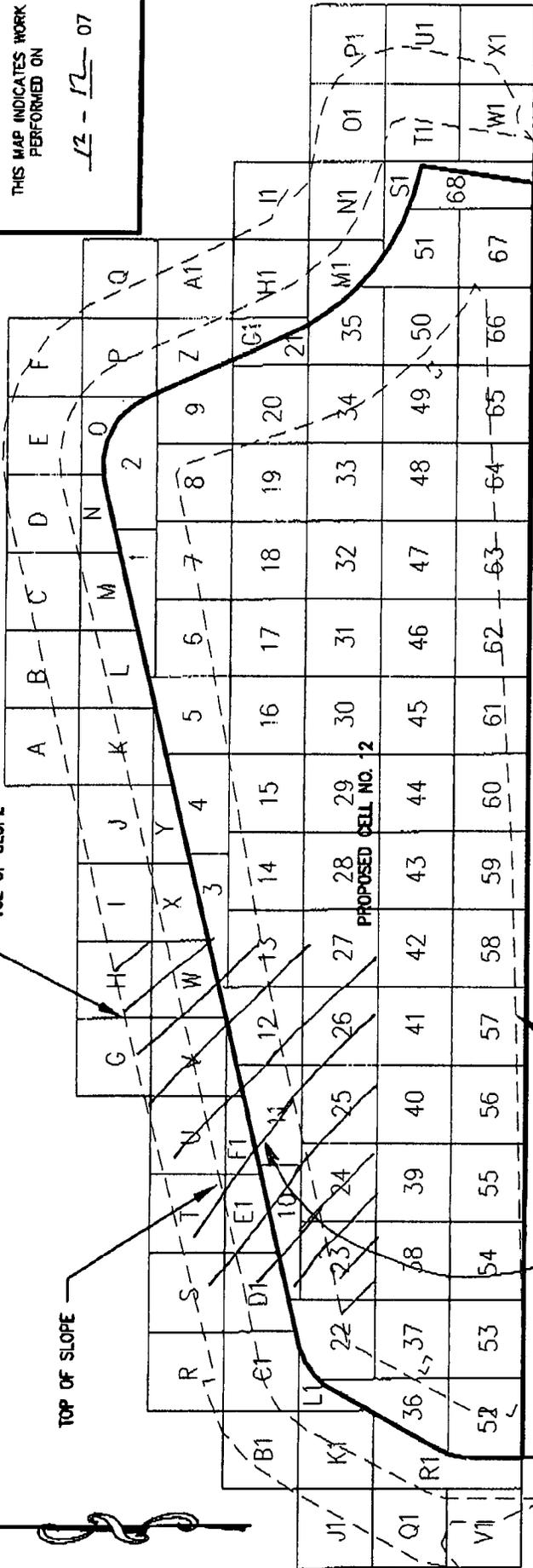
DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12-12-07

TOE OF SLOPE

TOP OF SLOPE



EXISTING CELL NO. 11

PLACEMENT OF COMPACTION OF STRUCTURAL FILL

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLFSB-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
BUNNELL-LAMMONS ENGINEERING, INC.  
604 PONDERS COURT  
CRENSHAW, SOUTH CAROLINA 29615  
PHONE: (843)288-1285 FAX: (843)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONG ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-13-07  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:00 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 11.0

PROJECT DAY NO. 39

VISITORS:  
 NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PREV CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 54 °F  
 DAYTIME HIGH: 73 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
COMPACTION OF IN PLACE FILL AT SUBGRADE IN THE CELL FLOOR.  
DAILY DRAINAGE ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.

\*\* CONTRACTOR/CQA MEETING: (BILL COOKSEY PRESENT) WASHED PROTECTIVE COVER MATERIAL WILL BEGIN ARRIVING NEXT WEEK.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR NUCLEAR DENSITY TESTS AND ONE DRIVE CYLINDER CALIBRATION.  
MONITORED COMPACTION OF IN PLACE FILL. PERFORMED SIX NUCLEAR DENSITY TESTS. DENSITY TESTS 81, 83, 85 & 86 DO NOT MEET PROJECT MOISTURE REQUIREMENTS. DRYING OF THE SOILS REPRESENTED BY THESE TESTS IS REQ'D.

RECORD PREPARED BY:

T. Stiles  
 Signature

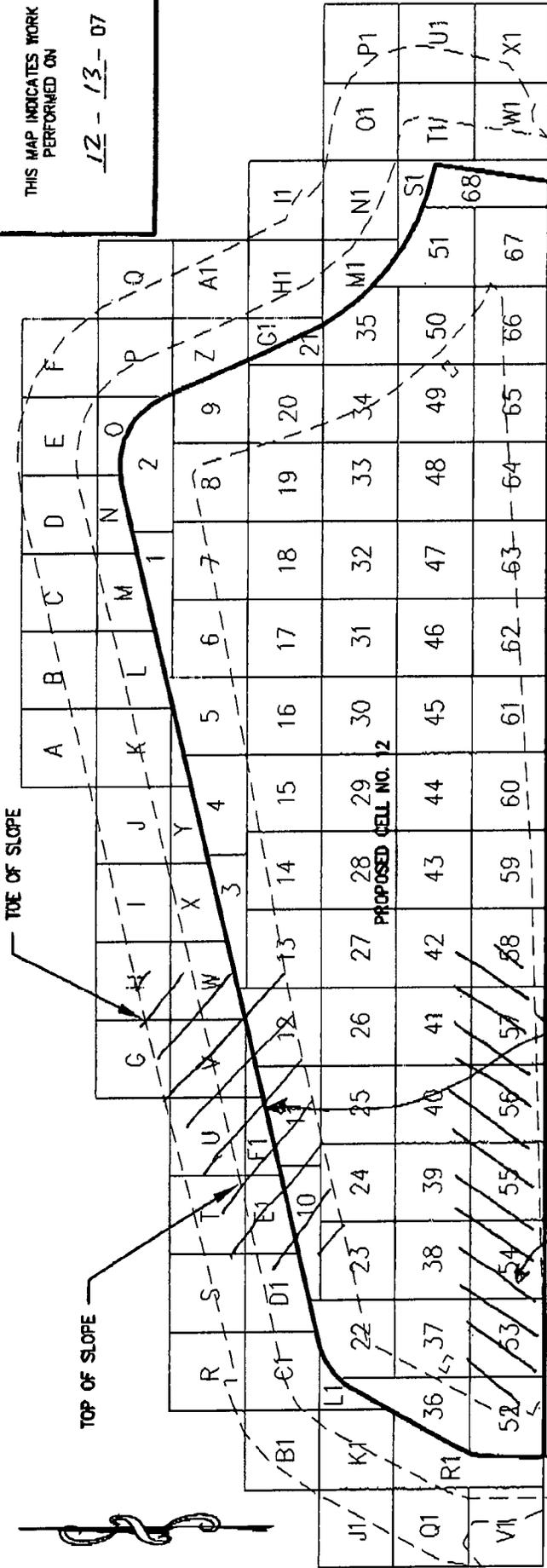
TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel Bunnell  
 Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 12 - 13 - 07



**LEGEND**

26, B  
GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF  
( $100' \times 100'$ )

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

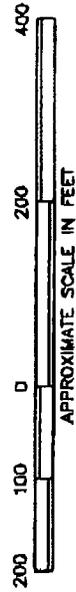
REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE

1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL**  
BURRELL-LAMMONS ENGINEERING, INC.  
6004 FORNERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1785 FAX: (864)288-4430



TOE OF SLOPE  
COMPACTION OF PLACE FILL  
TOE OF SLOPE  
COMPACTION OF STRUCTURAL FILL  
PLACEMENT OF STRUCTURAL FILL

DRAWN: AEH	DATE: 11-01-07
CHECKED: JAG	CAD: ECLF58-FSC0112
APPROVED:	JOB NO: J07-1001-58

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-56

CLIENT: HODGES, MARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-14-07

PROJECT DAY NO. 40

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 5:00 PM

LUNCH BREAK: 15

WORK HOURS: 1.00

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TEMPERATURE:  
MORNING LOW: 55 °F  
DAYTIME HIGH: 63 °F

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.

\* \* CONTRACTOR/CRA MEETING: THE PIPE AT PREVIOUS STAGING AREAS WEST OF CELLS 10 & 11 ARE SILTED UP. THE WEST DITCH IS CRITICAL FOR DIVERTING STORMWATER RUNOFF FROM THE NORTH SLOPE OF ACTIVE CELLS.

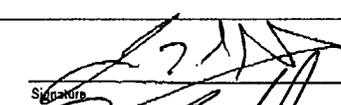
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED FOUR NUCLEAR DENSITY TESTS.

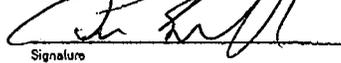
ATTENDED SAFETY MEETING. HELD BY R.B. BAKER.

RECORD PREPARED BY:



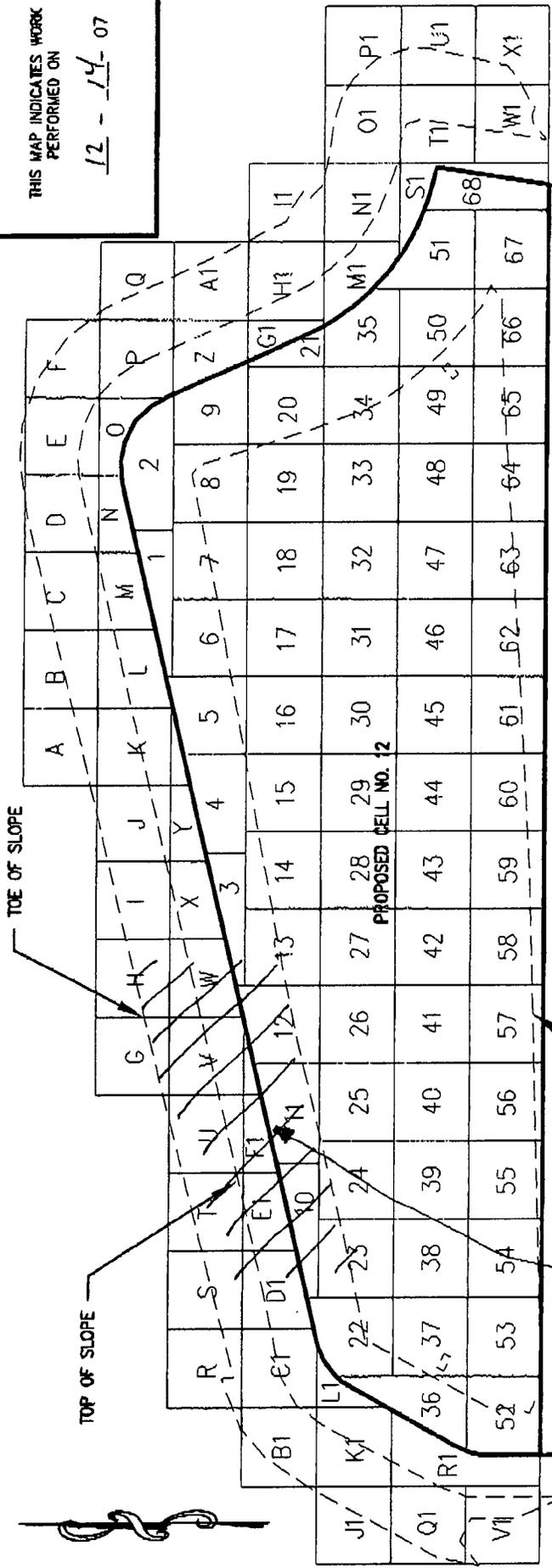
TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 12 - 14 - 07



**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARGIS, NEWBERRY AND TREBBLE, INC. DATED 9-27-07.

DRAWN: ADH	DATE: 11-01-07	 <b>SUNBEL-LANBORN ENGINEERING, INC.</b> 804 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE (864)288-1985 FAX (864)288-4430	FIGURE
CHECKED: JAG	CAD: ECUF58-FSCCELL12		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-15-97

PROJECT DAY NO. 41

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 4:00 PM

LUNCH BREAK: 15

WORK HOURS: 9.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: AM SUNNY PA CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 45 °F  
DAYTIME HIGH: 55 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
BEGAN EXCAVATION OF PROTECTIVE COVER MATERIAL AT THE TEMPORARY  
EDGE OF LINER IN CELL 11.  
CEASED HAULING AT 2:00 pm. BLADING AND SEALING FILL AREA.  
EXCAVATING TEMPORARY DRAINAGE TRENCH AT THE WEST END OF THE  
CELL. HEAVY RAINS FORECASTED OVERNIGHT.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR NUCLEAR DENSITY TESTS.  
MONITORED EXCAVATION OF PROTECTIVE COVER AT THE TEMPORARY  
EDGE OF LINER IN CELL 11.

RECORD PREPARED BY:

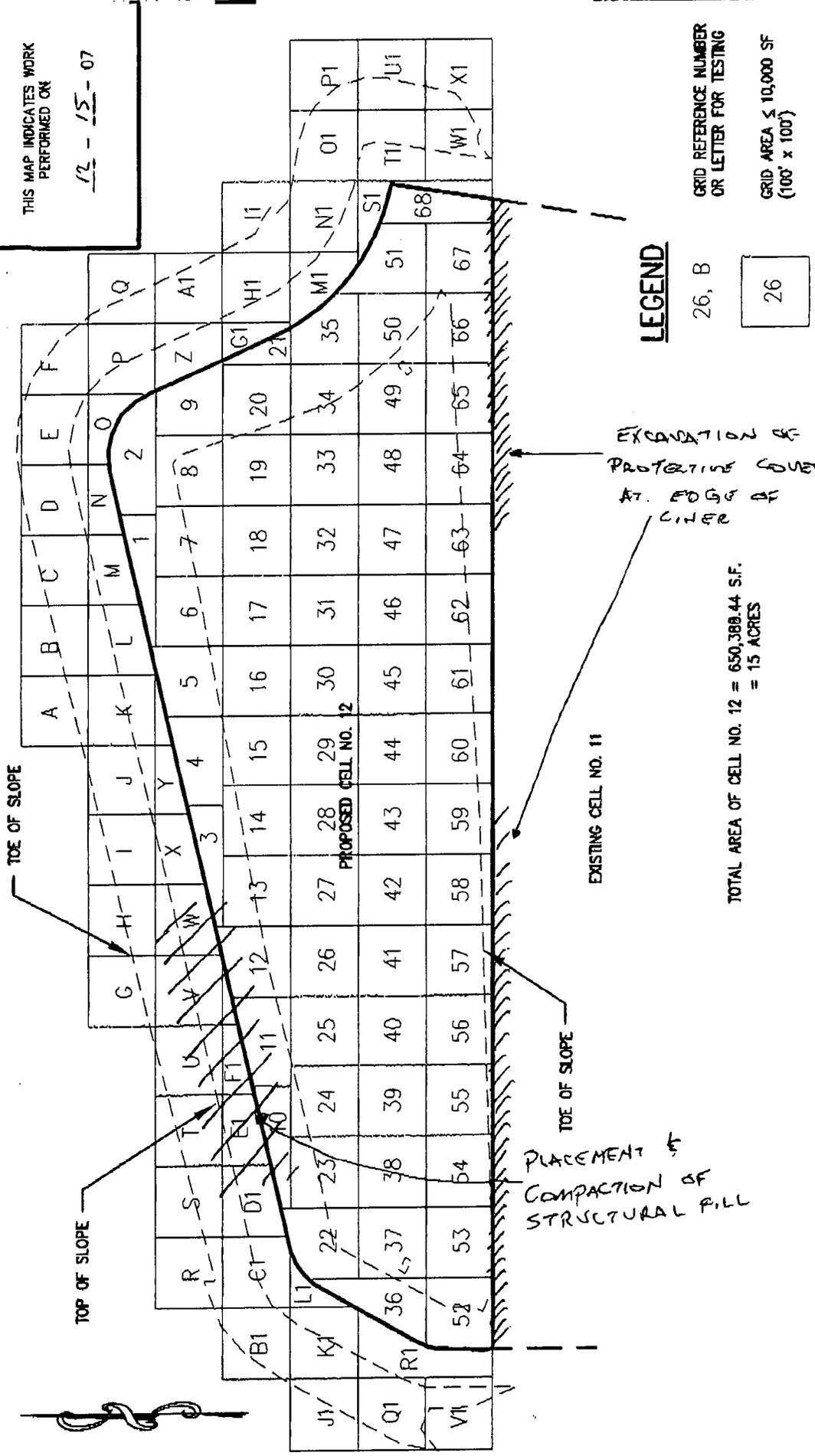
T. Stiles Signature TED STILES

RECORD REVIEWED & APPROVED BY:

D. Bunnell Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12 - 15 - 07



**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARGIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.



DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: ECLF58-FSCCELL12 JOB NO: J07-1001-58	<p><b>BUNNELL-LAWSONS ENGINEERING, INC.</b>          6004 FOWERS COURT          GREENVILLE SOUTH CAROLINA 29615          PHONE: (864)288-1255 FAX: (864)288-4430</p>	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <b>1</b>
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RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-16-07  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 3:00 PM  
LUNCH BREAK: -  
WORK HOURS: 8.0

PROJECT DAY NO. 42

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: PM SUNNY PTLY CLOUDY AM CLOUDY WINDY RAIN AM

TEMPERATURE:  
MORNING LOW: 48 °F  
DAYTIME HIGH: 58 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 1.75".  
DRAINING STANDING WATER FROM THE CELL.  
EXCAVATION OF PROTECTIVE COVER MATERIAL AT THE TEMPORARY EDGE  
OF LINER IN CELL 11.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
LIGHT RAINFALL ON/OFF THIS MORNING.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ACTIVITY IN THE CELL AREA.  
MONITORED EXCAVATION OF PROTECTIVE COVER AT THE TEMPORARY  
EDGE OF LINER IN CELL 11.

RECORD PREPARED BY:

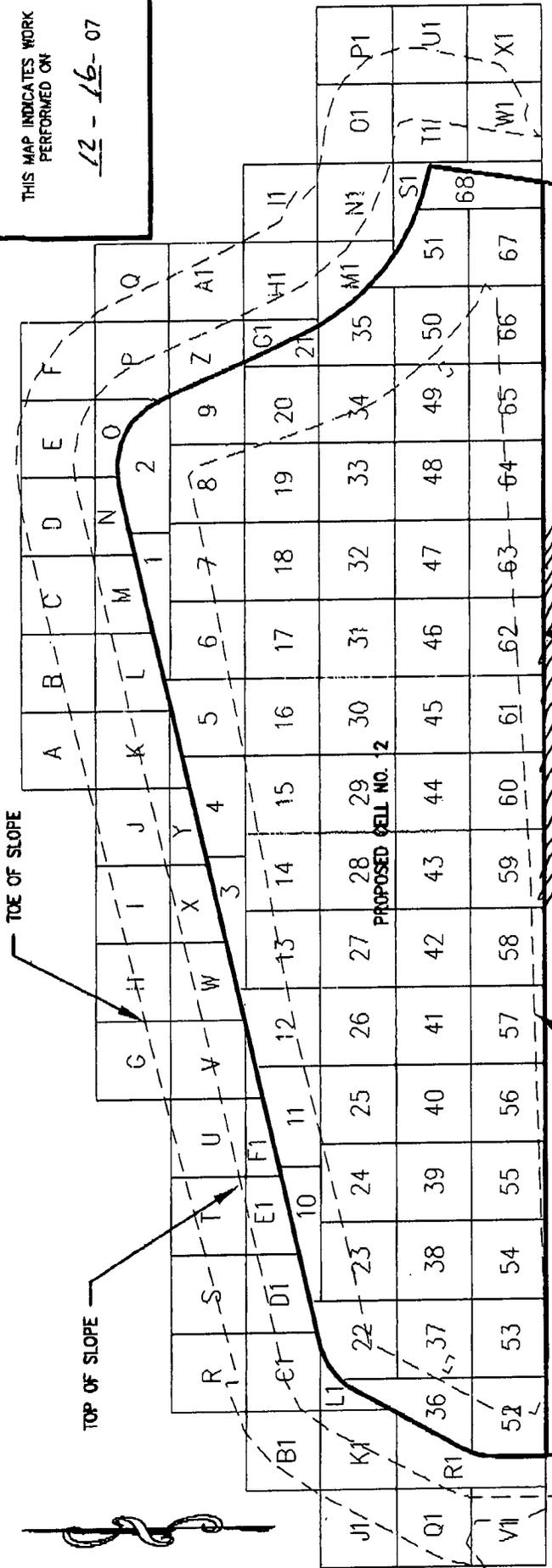
Ted Stiles Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel Bunnell Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12-16-07

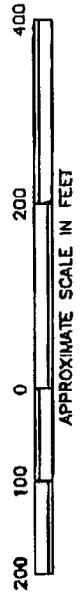


**LEGEND**

26, B  
GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TROBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: ECLF58-FSC112 JOB NO: J07-1001-58	<p><b>BUNNELL-LAMBORN ENGINEERING, INC.</b>          9004 POWERS COURT          GREENVILLE SOUTH CAROLINA 29615          PHONE: (864)288-1285 FAX: (864)288-4430</p>	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <h1>1</h1>
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RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-17-07

PROJECT DAY NO. 43

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 3:30 PM

LUNCH BREAK: 1.0

WORK HOURS: 8.0

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: BUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 35 °F  
DAYTIME HIGH: 49 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

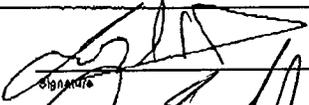
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
EXCAVATION OF RIM DITCH IN THE EAST END OF THE TRIPP  
PROPERTY BORROW AREA.  
DRAINING STANDING WATER FROM THE CELL AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

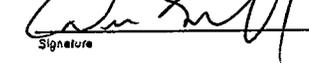
MONITORED ACTIVITY IN THE BORROW AREA.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-18-07

PROJECT DAY NO. 44

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 5:00 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: Sunny (AM), Pm PTLY CLOUDY, CLOUDY, WINDY, RAIN

TEMPERATURE:  
MORNING LOW: 25 °F  
DAYTIME HIGH: 52 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF WET MATERIAL IN THE EAST HALF OF THE CELL.  
THE WET AREAS ASSOCIATED WITH THE FAILING DENSITY TESTS  
HAVE BEEN REMOVED. THE MATERIAL HAS BLADED INTO PILES  
AND WILL BE HAULED TO THE EAST END OF THE CELL.  
EXCAVATION ALONG THE NORTH EDGE OF CELL 11 TO  
EXPOSE THE 24" LAYER OF CLAY LINER FOR TIE IN.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW  
AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

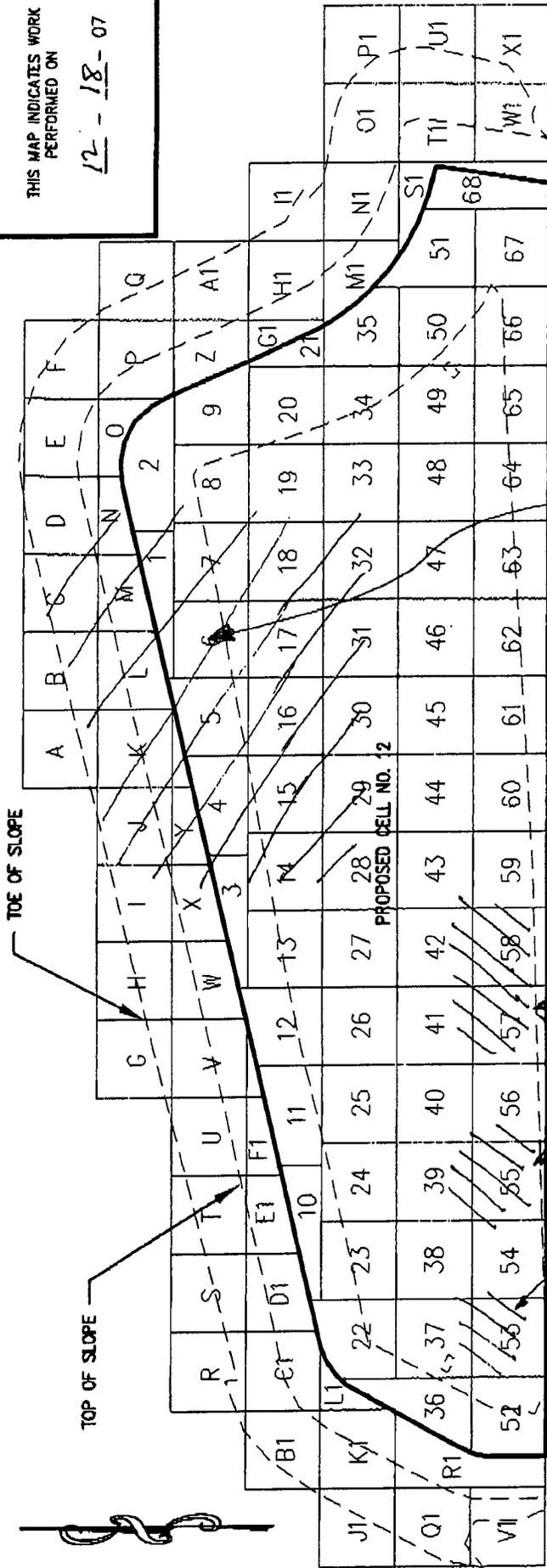
MONITORED ALL ACTIVITY IN THE CELL AREA.  
RECEIVED TURBIDITY METER. COMPLETED TESTING OF THE SAMPLES  
TAKEN WHILE DEVELOPING MONITORING WELL GW-16R.  
WET SOIL WAS MOVED TO THE EAST END OF THE CELL  
TO DRY PRIOR TO COMPACTION.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12-18-07



**LEGEND**

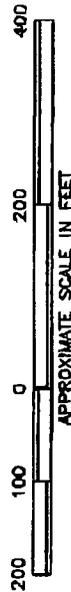
26, B  
GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF (100' x 100')

26

REFERENCE:  
DRAWING TITLED 'TOP OF CLAY LINER GRADING PLAN' BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



FIGURE

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

1

**IBL**  
BURRELL-LAWMONS ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: (864)288-4430

DATE: 11-01-07

DRAWN: AEH  
CHECKED: JAG  
JOB NO: J07-1001-58

APPROVED:

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-19-07

PROJECT DAY NO. 45

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

RAY HOFFMAN REPUBLIC  
CHRIS REPUBLIC

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 30 °F  
DAYTIME HIGH: 55 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL AT SUBGRADE  
WHERE THE WET SOILS HAD BEEN REMOVED.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
RECEIVED H.D.P.E. PIPE FOR CELL 12. SEE ATTACHED PAGE.  
LIGHT RAINFALL AT 12:45 PM.

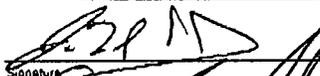
\* CONTRACTOR/COA MEETING: BILL COOKEY IS TO CONFIRM DELIVERY DATE OF  
WASHED SAND. R. B. BAILER WILL BE OFFSITE BETWEEN CHRISTMAS AND  
NEW YEARS DAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR DRIVE CYLINDER DENSITY TESTS.  
MONITORED UNLOADING OF H.D.P.E. PIPE.

RECORD PREPARED BY:

 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 12-19-07

PAGE 2 OF 2

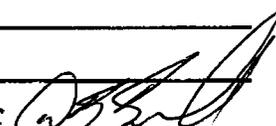
CQA TECHNICIAN:

  
Signature

TED STILES

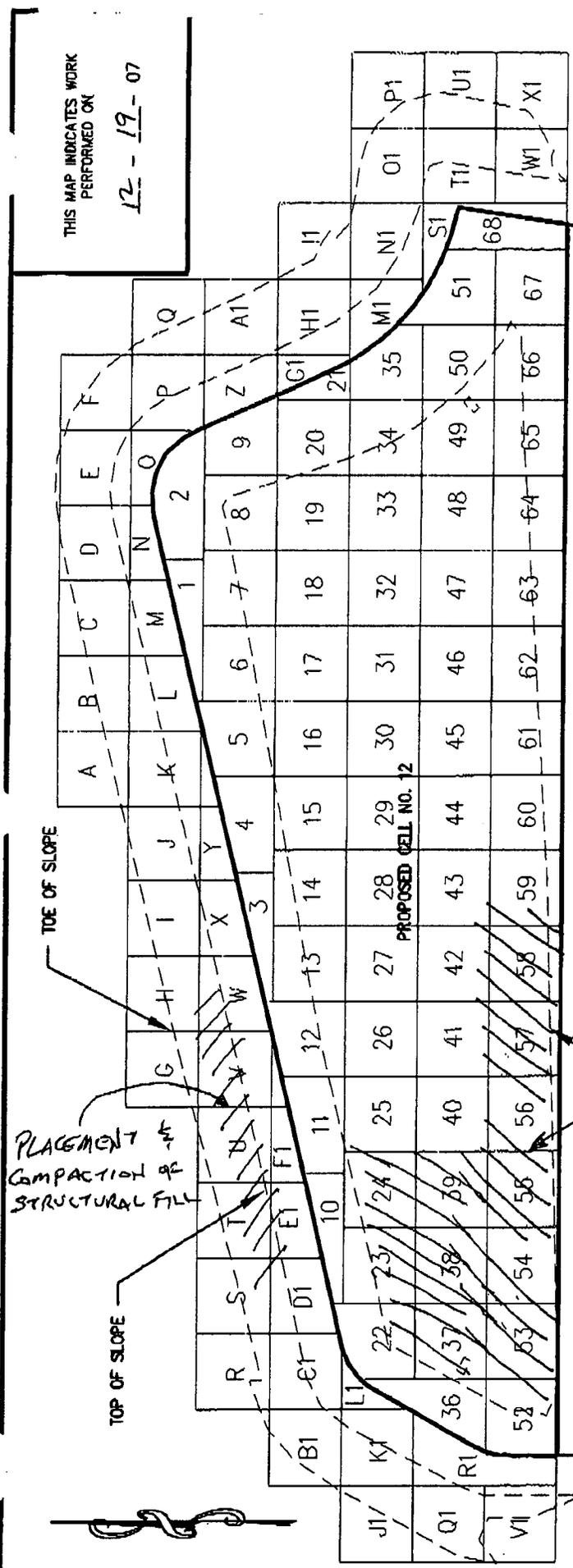
H.D.P.E. PIPE INVENTORY

- 6" SOLID SDR 11	52 pcs @ 40'-0"	2080 LF	FORCE MAIN CARRIER
- 8" SOLID SDR 11	14 pcs @ 40'-0"	560 LF	LEACHATE CLEANOUTS
- 4" PERF. SDR 11	116 pcs @ 40'-0"	4640 LF	LATERALS IN CELL
- 24" SOLID SDR 17	✓ 8 pcs @ 50'-0"	400 LF	SUMP RISER
- 10" SOLID SDR 17	63 pcs @ 40'-0"	2520 LF	FORCE MAIN CONTAINMENT

REVIEWED: 

THIS MAP INDICATES WORK PERFORMED ON

12 - 19 - 07



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC12
APPROVED:		JOB NO:	J07-1001-58

**IBLE** INC.  
 BURRELL-LANSON ENGINEERING, INC.  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1205 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-20-07

PROJECT DAY NO. 46

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY (with PM handwritten), CLOUDY, WINDY, RAIN, PTLY CLOUDY (with AM handwritten)

TEMPERATURE:  
MORNING LOW: 28 °F  
DAYTIME HIGH: 55 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

ONLY DEMATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOURTEEN DRIVE CYLINDER DENSITY TESTS. TEST SFD 104, AT SUBGRADE, HAS FAILED DUE TO EXCESSIVE MOISTURE AND LOW COMPACTION.

RECORD PREPARED BY:

*Ted Stiles*  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

*Daniel B. Bunnell*  
Signature

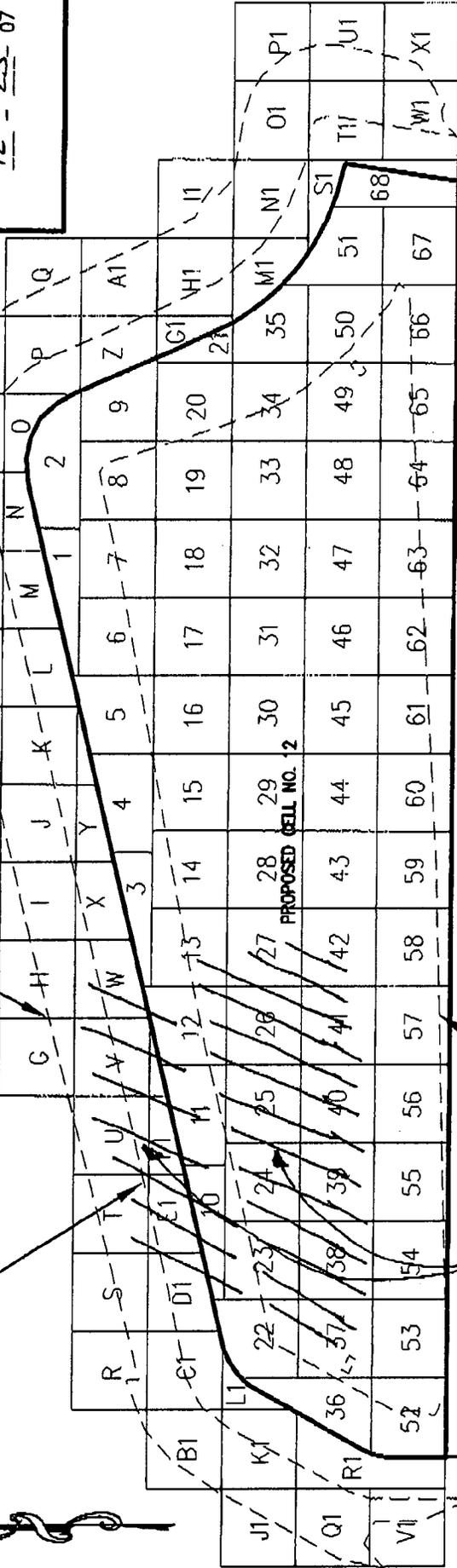
DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

12 - 22 - 07

TOE OF SLOPE

TOP OF SLOPE



EXISTING CELL NO. 11

PLACEMENT COMPACTION OF STRUCTURAL FILL

PROPOSED CELL NO. 12

**LEGEND**

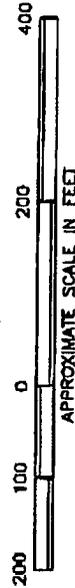
26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
**BUNNELL-LAWSON ENGINEERING, INC.**  
 604 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE (864)288-1285 FAX (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 12-21-07

PROJECT DAY NO. 47

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 2:30 PM

LUNCH BREAK: -

WORK HOURS: 8.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 43 °F  
DAYTIME HIGH: 55 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
RAIN IS FORECAST FOR THIS MORNING AND LAST THROUGHOUT THE  
DAY. HEAVY RAINS ARE POSSIBLE.  
BLADING AND SEALING THE BORROW AREA, HAUL ROAD AND CELL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ACTIVITY IN THE CELL AND BORROW AREA.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-2-08

PROJECT DAY NO. 59

ARRIVAL TIME: / AM

DEPARTURE TIME: / PM

LUNCH BREAK: /

WORK HOURS: /

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: BUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 19 °F  
DAYTIME HIGH: 37 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

R.B. BAKER IS BLADING AND REMOVING ANY STANDING WATER.  
THERE WAS NO FILL PLACEMENT TODAY.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
RAINFALL, BETWEEN 12-21-07 AND 1-1-08, WAS RECORDED AT  
2.75".  
RECEIVED H.D.P.E PIPE. SEE ATTACHED PIPE INVENTORY LIST.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

CONFIRMED SITE CONDITIONS AND ACTIVITY VIA PHONE. DRIVING  
TO SITE.

RECORD PREPARED BY: Ted Stiles TED STILES

RECORD REVIEWED & APPROVED BY: Daniel B. Bunnell DANIEL B. BUNNELL, P.E.

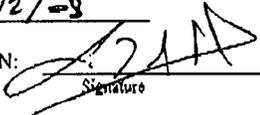
RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 1/2/08

PAGE 2 OF 2

CQA TECHNICIAN:  TED STILES

PIPE INVENTORY LIST

DELIVERED	1-2-08	TOTAL AMT.	ON SITE INCLUDING CURRENT DELIVERY
2" SOLID SDR 11 D.C. PIPE	3 PCS @ 40'-0" EA = 120 LF	→ (V) 120 LF	
4" SOLID SDR 17 D.C. PIPE	3 PCS @ 40'-0" EA = 120 LF	→ (V) 120 LF	
6" SOLID SDR 11 D.C. PIPE	8 PCS @ 40'-0" EA = 320 LF	→ (V) 240 LF	
8" SOLID SDR 11 LEACHATE PIPE	4 PCS @ 40'-0" EA = 160 LF	→ (V) 720 LF	
* 6" SOLID SDR 17 (UNKNOWN PIPE)	6 PCS @ 40'-0" EA = 240 LF	→ (240 LF) *	
** 24" SOLID SDR 17 RISER PIPE	1 PC @ 50'-0" EA = 50 LF	→ (V) 450 LF	
4" PERFORATED SDR 11 LEACHATE PIPE	37 PCS @ 40'-0" EA = 1480 LF	→ (V) 6120 LF	
8" PERFORATED SDR 11 LEACHATE PIPE	78 PCS @ 40'-0" EA = 3120 LF	→ (V) 3120 LF	
10" SOLID SDR 17 D.C. PIPE	_____	→ 2520 LF	

(V) INDICATES THE REQUIRED QUANTITIES, PER PROJECT DRAWINGS IS ON SITE  
 \* 6" SOLID (SDR 17) NOT ON DRAWINGS. POSSIBLE USE AS SEEWYS OR 4" LATERALS.  
 \*\* 24" PERFORATED w/ 4'x4'x2" FLAT STOCK IS NOT ON SITE.

REVIEWED: 

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-3-08  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 6:00 PM  
LUNCH BREAK: 15  
WORK HOURS: 10.5

PROJECT DAY NO. 60

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 23 °F  
DAYTIME HIGH: 41 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL

\* CONTRACTOR / CQA MEETING: FINE GRADING ACTIVITY ON THE WEST END IS DELAYED  
AWAITING GPS UPDATE ON RECENT GRADE CHANGES.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:

Ted Stiles Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell Signature DANIEL B. BUNNELL, P.E.



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-4-07  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.5

PROJECT DAY NO. 61

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

STEVE NICHOLS REPUBLIC  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PARTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 18 °F  
DAYTIME HIGH: 46 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

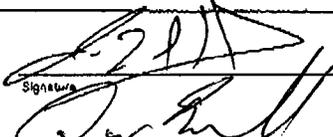
DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

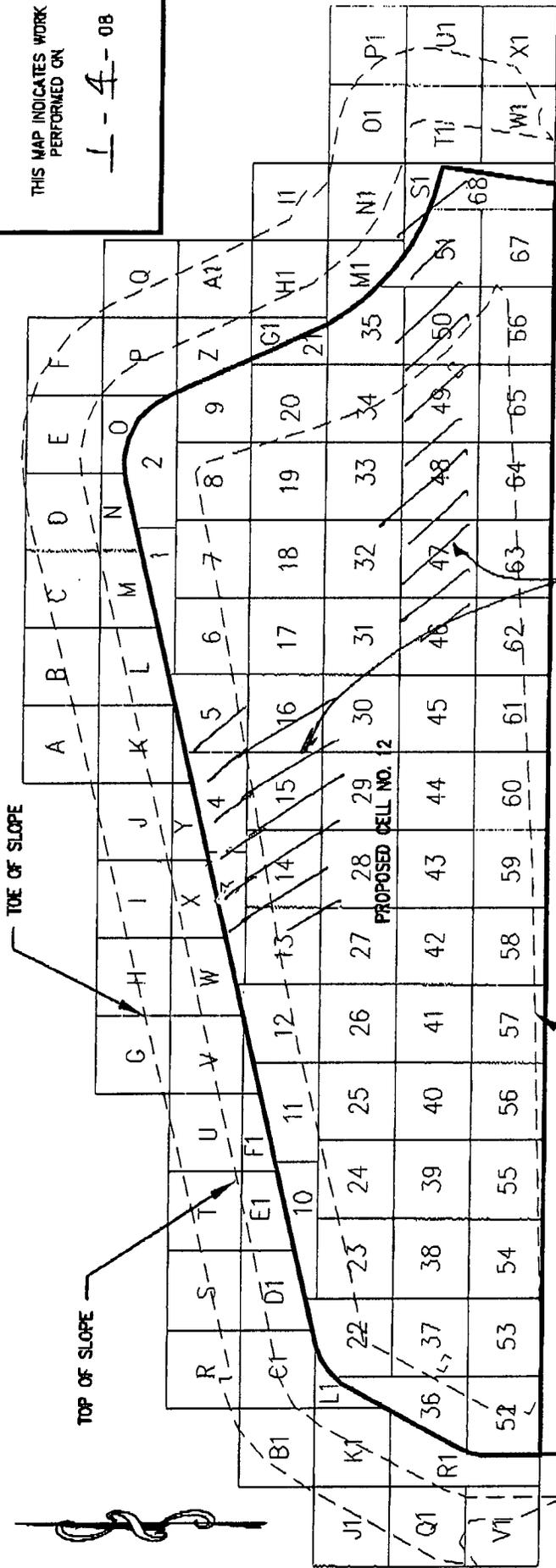
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FOUR DRIVE CYLINDER DENSITY TESTS.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RECORD PREPARED BY: \_\_\_\_\_ TED STILES

  
Signature  
Signature

RECORD REVIEWED & APPROVED BY: \_\_\_\_\_ DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
 L-4-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA ≤ 10,000 SF (100' x 100')

26

REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

PLACEMENT AND COMPACTION OF STRUCTURAL FILL

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
 = 15 ACRES



DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC12
APPROVED:		JOB NO:	J07-1001-58

**IBL** INC.  
 RUMBLE-LAMBSON ENGINEERING, INC.  
 6004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE (864)288-1285 FAX (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-5-08

PROJECT DAY NO. 62

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: AM  
SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 27 °F  
DAYTIME HIGH: 54 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED FIVE DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

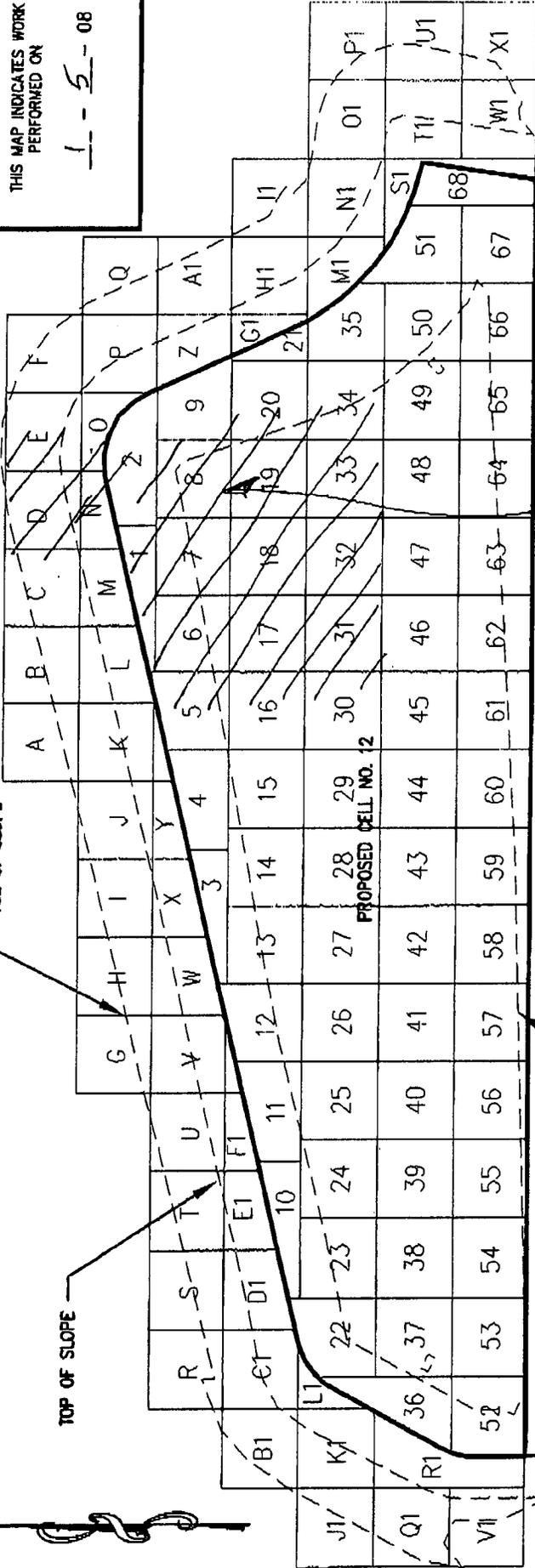
DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

1-5-08

TOE OF SLOPE

TOP OF SLOPE



**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
 = 15 ACRES

EXISTING CELL NO. 11

PLACEMENT OF COMPACTION OF STRUCTURAL FILL



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	EQLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
 BUNNELL-LANPHER ENGINEERS, INC.  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE (864)238-1265 FAX (864)238-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-6-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: 1  
WORK HOURS: 10.5  
ONSITE PERSONNEL: TED STILES

PROJECT DAY NO. 63

VISITORS:  
NAME REPRESENTING

WEATHER: SUNNY CLOUDY WINDY  
AM PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 43 °F  
DAYTIME HIGH: 64 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
GRADING THE TIE-IN TO CELL 11 AND THE SOUTH SLOPE OF  
CELL 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED THREE DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY: TED STILES

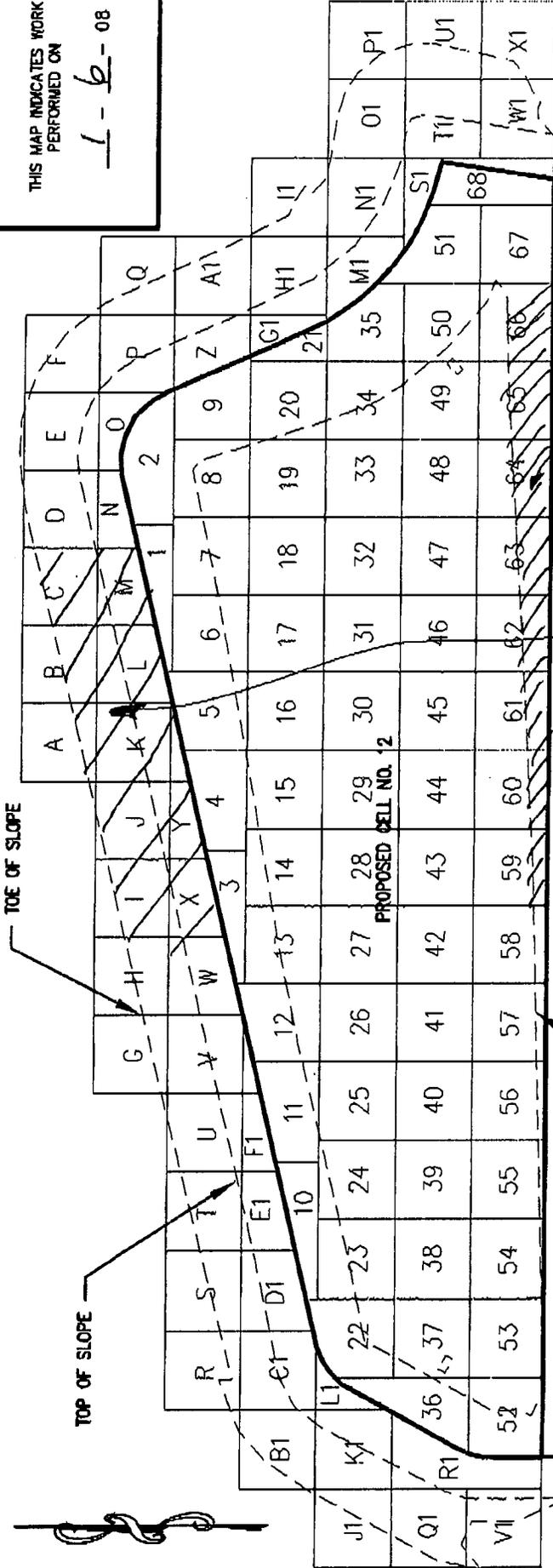
*[Handwritten Signature]*  
Signature

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

*[Handwritten Signature]*  
Signature

THIS MAP INDICATES WORK PERFORMED ON

1-6-08



**LEGEND**

- 26, B
- GRID REFERENCE NUMBER OR LETTER FOR TESTING
- GRID AREA  $\leq 10,000$  SF (100' x 100')

26

GRADING EDGE OF CELL 11/CELL 12 TIE IN AND CELL 12 SLOPE

PLACEMENT OF COMPACTED STRUCTURAL FILL

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE	1		
FIELD SKETCH - CELL NO. 12	EAST CAROLINA LANDFILL		
	BERTIE COUNTY, NORTH CAROLINA		
<b>IBL</b> INC.			
BURNELL-LAMBSON ENGINEERING, INC.			
804 POWERS COULET			
GREENVILLE SOUTH CAROLINA 29615			
PHONE: (864)288-1285 FAX: (864)288-4430			
DRAWN: AEH	DATE: 11-01-07		
CHECKED: JAG	CAD: EQLF58-FSC112		
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-7-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 6:00 PM  
LUNCH BREAK: .5  
WORK HOURS: 11.0

PROJECT DAY NO. 64

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 46 °F  
DAYTIME HIGH: 70 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY Dewatering activity in the Tripp Property Borrow Area.  
Placement and compaction of structural fill.  
Received 16 rolls of textured geomembrane liner and 17  
rolls of smooth geomembrane liner. Received 15 spools of  
H.D.P.E. welding rod.  
Began fine grading activity in the west end of cell 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

Monitored placement and compaction of structural fill.  
Performed three drive cylinder density tests.  
Received all 16 rolls of approved textured geomembrane liner.  
A minimum of 25" of clay liner has been confirmed along the  
line at cell 12.

RECORD PREPARED BY:

Ted Stiles  
Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 11/7/08

PAGE 2 OF 2

CQA TECHNICIAN:  TED STILES

GEOMEMBRANE INVENTORY

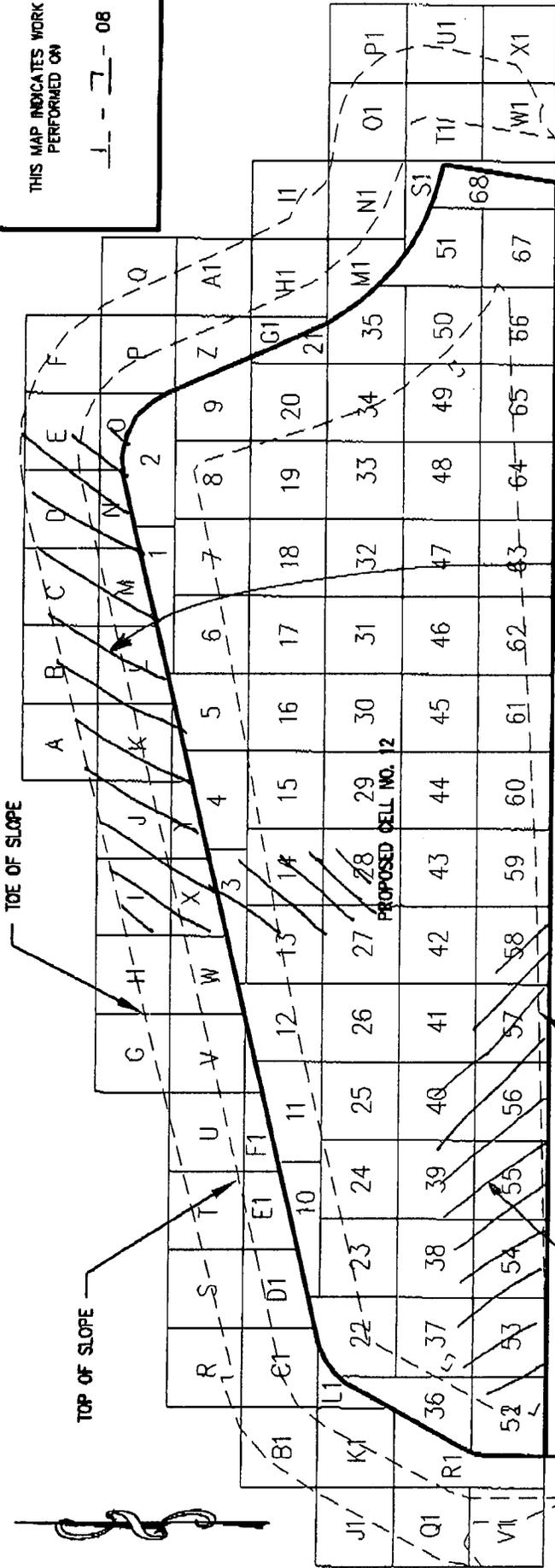
TEXTURED

SMOOTH

1) HT1-6-07-7604-5	1) HS2-6-07-6076
2) HT1-6-07-7605-5	2) HS2-6-07-6077
3) HT1-6-07-7606-5	3) HS2-6-07-6078
4) HT1-6-07-7609-5	4) HS2-6-07-6079
5) HT1-6-07-7610-5	5) HS2-6-07-6080
6) HT1-6-07-7611-5	6) HS2-6-07-6081
7) HT1-6-07-7612-5	7) HS2-6-07-6082
8) HT1-6-07-7613-5	8) HS2-6-07-6083
9) HT1-6-07-7614-5	9) HS2-6-07-6084
10) HT1-6-07-7615-5	10) HS2-6-07-6085
11) HT1-6-07-7616-5	11) HS2-6-07-6086
12) HT1-6-07-7617-5	12) HS2-6-07-6087
13) HT1-6-07-7618-5	13) HS2-6-07-6088
14) HT1-6-07-7619-5	14) HS2-6-07-6090
15) HT1-6-07-7621-5	15) HS2-6-07-6091
16) HT1-6-07-7622-5	16) HS2-6-07-6092
	17) HS2-6-07-6095

THIS MAP INDICATES WORK PERFORMED ON

11-7-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

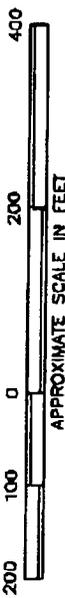
26 GRID AREA ≤ 10,000 SF (100' x 100')

PLACEMENT OF COMPACTION & STRUCTURAL FILL

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES

FINE GRADING SUBGRADE



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARGIS, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC112
APPROVED:		JOB NO:	107-1001-58

**IBL**  
**BURDELL-LAMBSON ENGINEERING, INC.**  
 604 FONDERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE (864)223-1285 FAX (864)223-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-8-08

PROJECT DAY NO. 65

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

TEMPERATURE:

MORNING LOW: 52 °F

DAYTIME HIGH: 73 °F

WEATHER:  SUNNY  CLOUDY  WINDY

RAIN

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION

STRUCTURAL FILL

COMPACTED CLAY LINER

LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:

Ted Stiles  
Signature

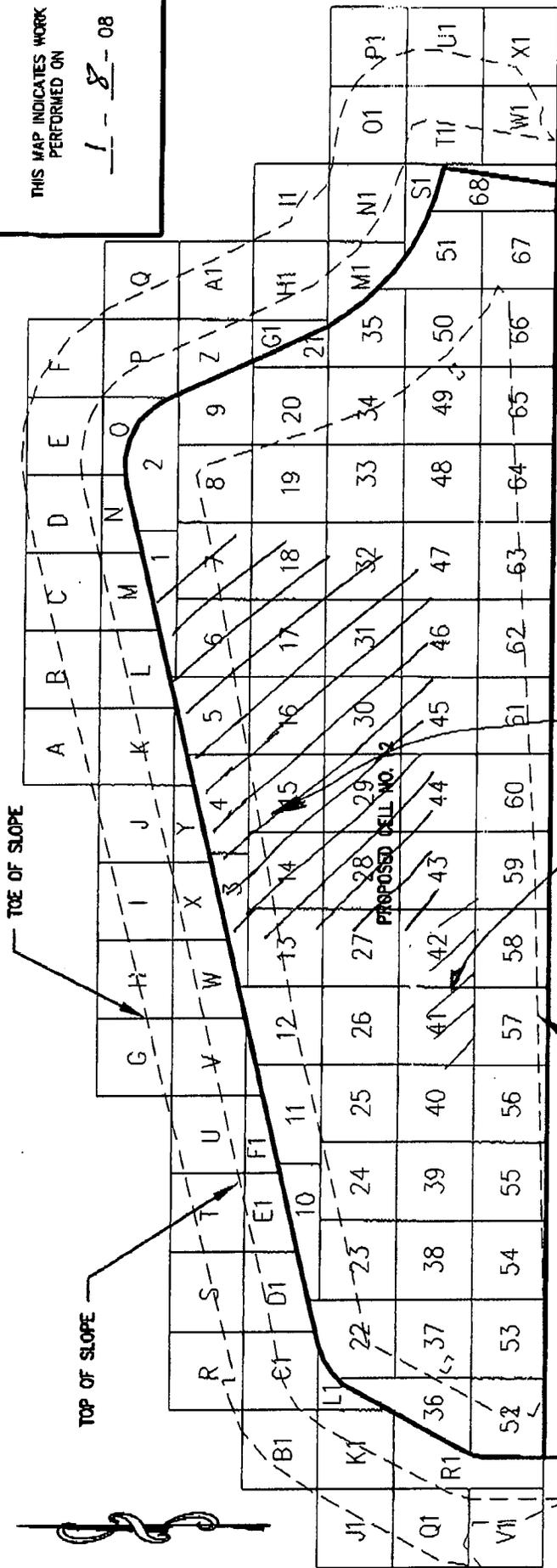
TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK  
PERFORMED ON  
1-8-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

26

PLACEMENT & COMPACTION OF STRUCTURAL FILL

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HOODGES,  
HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	JD7-1001-58

**IBL**  
BIRNELL-LAMBSON ENGINEERING, INC.  
6004 POWERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE (864)955-1285 FAX (864)955-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-9-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:00 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 11.0

PROJECT DAY NO. 66

VISITORS:  
 NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: PM SUNNY AM CLOUDY WIND  
PTLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 59 °F  
 DAYTIME HIGH: 69 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

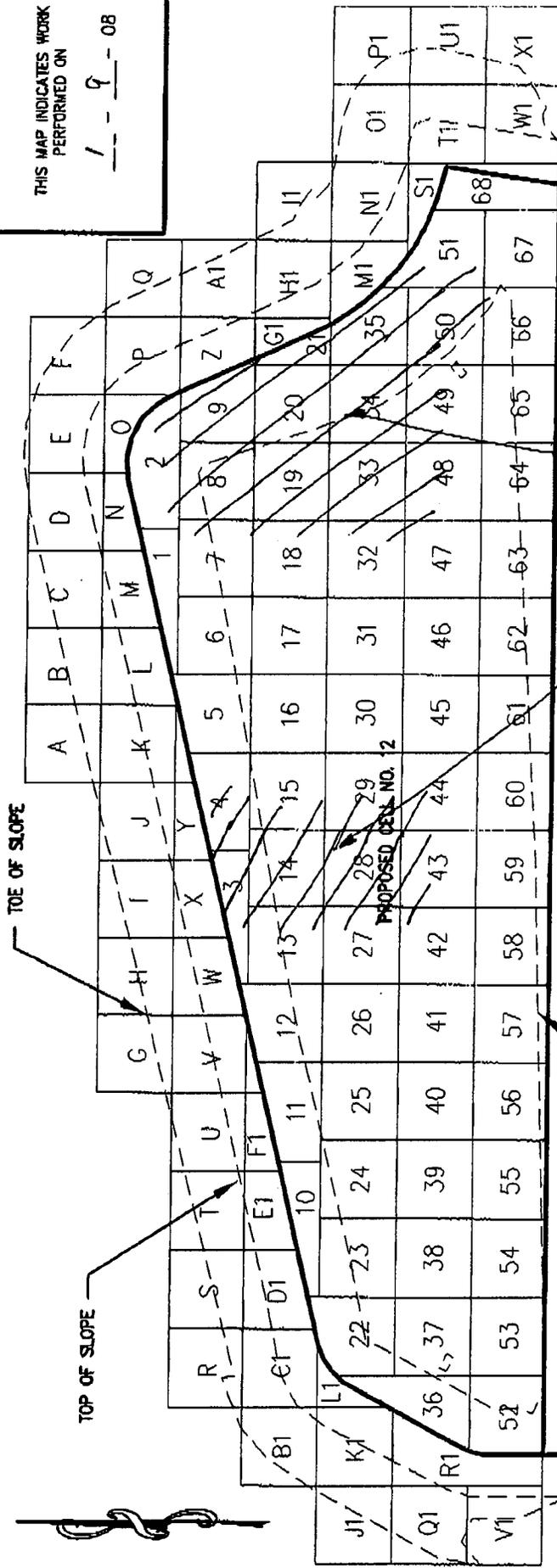
**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK  
PERFORMED ON  
1 - 9 - 08



**LEGEND**

26, B      GRID REFERENCE NUMBER  
OR LETTER FOR TESTING

26      GRID AREA ≤ 10,000 SF  
(100' x 100')

PLACEMENT  
COMPACTION  
STRUCTURAL FILL

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES,  
HARBIN, MEMBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC112
APPROVED:		JOB NO:	JD7-1001-58

**IBL** INC.  
BUNWELL-JAMMONS ENGINEERING, INC.  
404 POWERS COURT  
GREENSBORO, NORTH CAROLINA 27415  
PHONE: (847)250-1205 FAX: (847)258-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-10-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.5

PROJECT DAY NO. 67

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: AM SUNNY PM CLOUDY RAIN  
PTLY CLOUDY

TEMPERATURE:  
MORNING LOW: 50 °F  
DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVED TWO TRUCK LOADS OF GEOMEMBRANE LINER.  
RECEIVED FIVE ROLLS OF GEOMEMBRANE LINER DESIGNATED FOR  
RAIN FLAP AND RUBSHEET USE: HS2-6-07-1293-5, HS2-6-07-1294-5,  
HS2-6-07-1296-5, HS2-6-07-1297-5, HS2-6-07-1298-5.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLINDER DENSITY TESTS.  
MONITORED UNLOADING OF GEOMEMBRANE LINER.

RECORD PREPARED BY: TED STILES  
*Ted Stiles* Signature

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
*Daniel Bunnell* Signature

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 11/10/08

PAGE 2 OF 2

CQA TECHNICIAN:

Signature

TED STILES

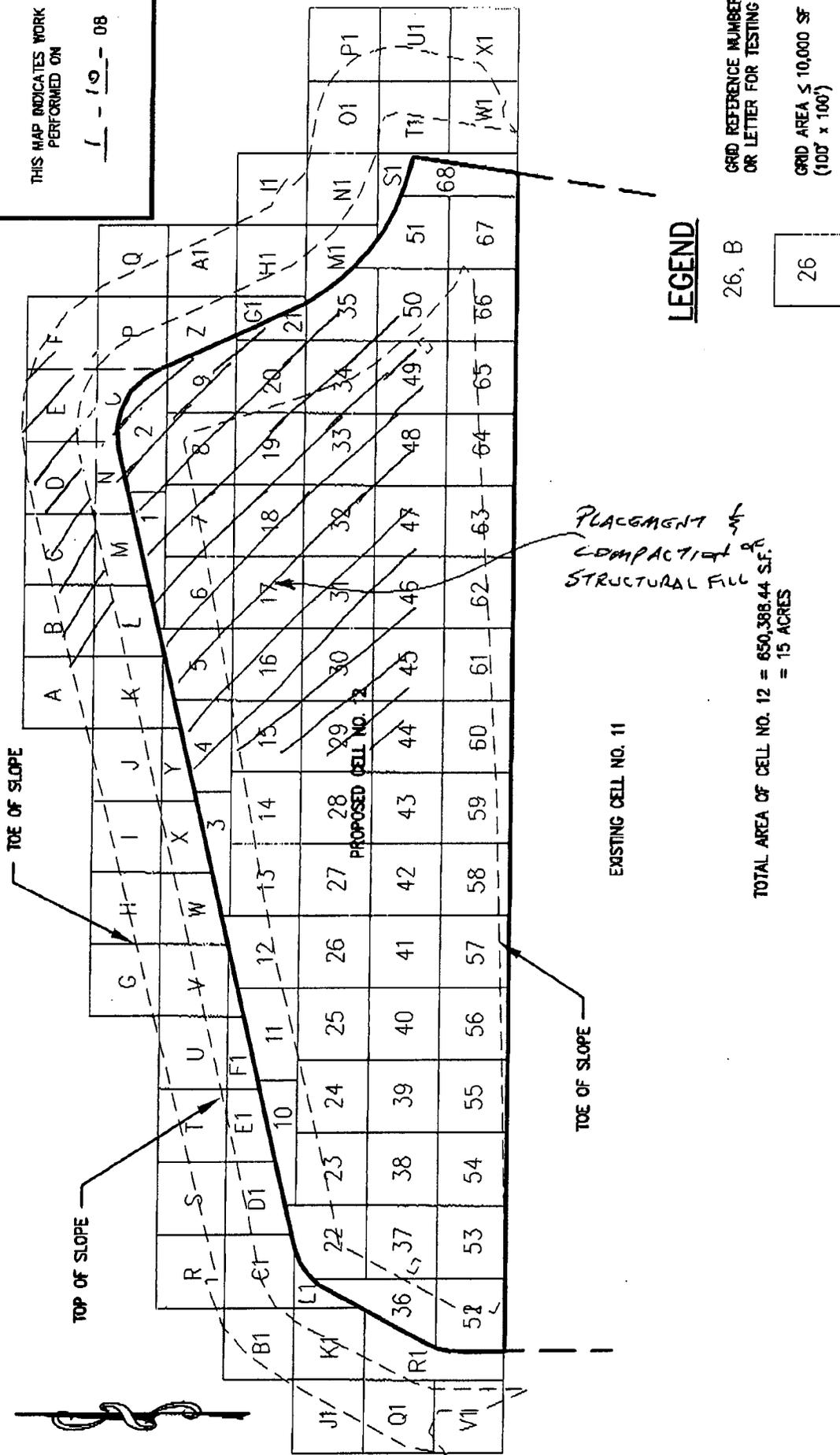
MEMBRANE INVENTORY

SMOOTH LINER

- 18) HS2-6-07-6117 ✓
- 19) HS2-6-07-6106 ✓
- 20) HS2-6-07-6100 ✓
- 21) HS2-6-07-6113 ✓
- 22) HS2-6-07-6116 ✓
- 23) HS2-6-07-6112 ✓
- 24) HS2-6-07-6115 ✓
- 25) HS2-6-07-6111 ✓
- 26) HS2-6-07-6110 ✓
- 27) HS2-6-07-6103 ✓
- 28) HS2-6-07-6121 ✓
- 29) HS2-6-07-6107 ✓
- 30) HS2-6-07-6114 ✓
- 31) HS2-6-07-6105 ✓
- 32) HS2-6-07-6119 ✓
- 33) HS2-6-07-6118 ✓
- 34) HS2-6-07-6120 ✓
- 35) HS2-6-07-6102 ✓

THIS MAP INDICATES WORK PERFORMED ON

L - 10 - 08

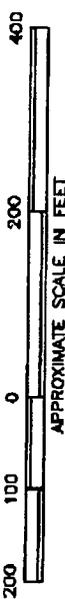


**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA ≤ 10,000 SF (100' x 100')

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
 = 15 ACRES



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, MARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	EQLF58-FSC112
APPROVED:		JOB NO.:	JD7-1001-58

**IBL**  
 RUMBLE-LAMMONS ENGINEERING, INC.  
 604 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE (864)255-1285 FAX (864)255-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 11-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.5

PROJECT DAY NO. 68

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: BUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 66 °F  
DAYTIME HIGH: 79 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVED THE FINAL TRUCK LOAD OF GEOMEMBRANE LINER.

CONTRACTOR/CON MEETING: TOMMY FIELDS SCHEDULED FOR TUESDAY. TOMMY LEE  
IS PLANNING TO HAVE THE CELL FLOOR GRADED AND THE LIMITS  
OF THE FILL WEST OF THE HIGHEST LEACHATE LINE POINTS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

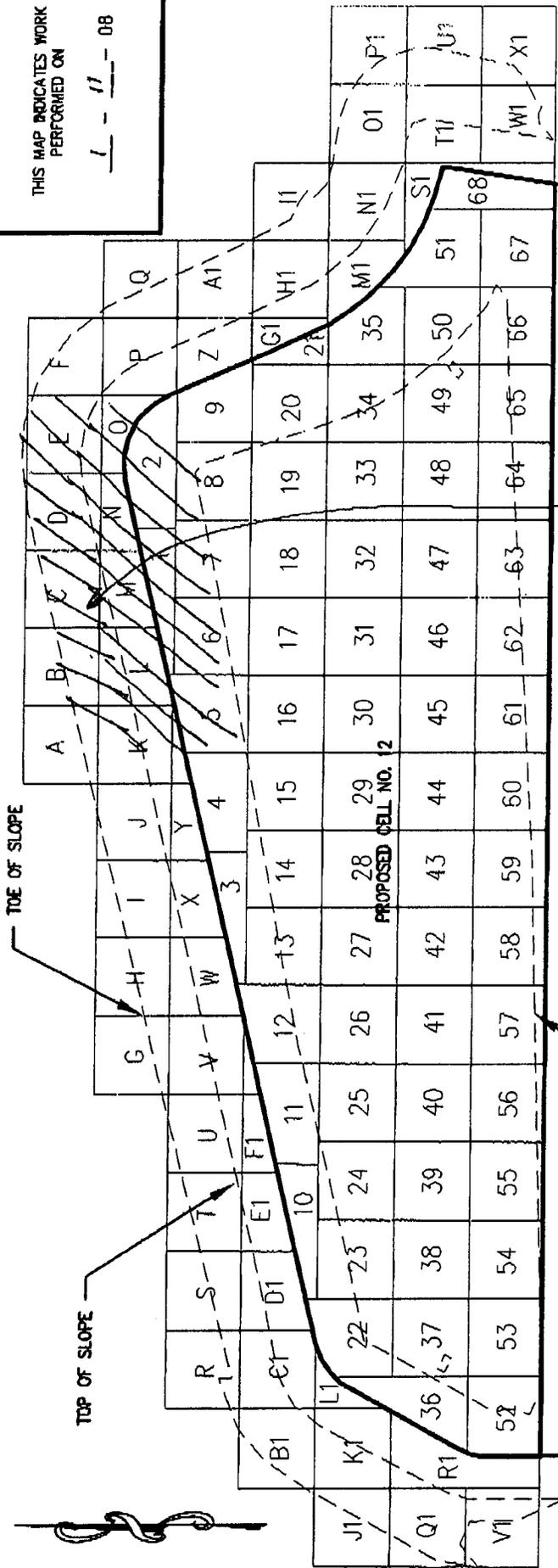
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLINDER DENSITY TESTS.  
MONITORED UNLOADING OF GEOMEMBRANE LINER.

RECORD PREPARED BY: Ted Stiles TED STILES

RECORD REVIEWED & APPROVED BY: Daniel B. Bunnell DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

11-08



**LEGEND**

- 26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING
- 26 GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07
CHECKED: JAG	CAD: ECLF58-FSC112
APPROVED:	JOB NO: J07-1001-58

**IBLE** INC.  
BUNNELL-JANSONS ENGINEERING, INC.  
604 POWERS COURT 28915  
GREENVILLE SOUTH CAROLINA  
PHONE: (864)288-1235 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

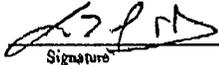
RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 1-11-08

PAGE 2 OF 2

CQA TECHNICIAN:  TED STILES  
Signature

GEOMEMBRANE LINER

INVENTORY

-SMOOTH LINER-

36) HS2-6-07-6089-5

37) HS2-6-07-6093-5

38) HS2-6-07-6094-5

39) HS2-6-07-6096-5

40) HS2-6-07-6097-5

41) HS2-6-07-6098-5

42) HS2-6-07-6099-5

43) HS2-6-07-6101-5

44) HS2-6-07-6104-5

45) HS2-6-07-6108-5

46) HS2-6-07-6109-5

SMOOTH LINER - 46 ROLLS

TEXTURED LINER - 16 ROLLS

RAINFAP/RUB SHEET LINER - 5 ROLLS

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-12-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.5

PROJECT DAY NO. 69

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 45 °F  
DAYTIME HIGH: 56 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

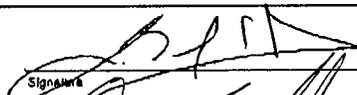
DAILY DRAINAGE ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
FINE GRADING THE CELL FLOOR.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

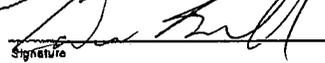
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:



TED STILES

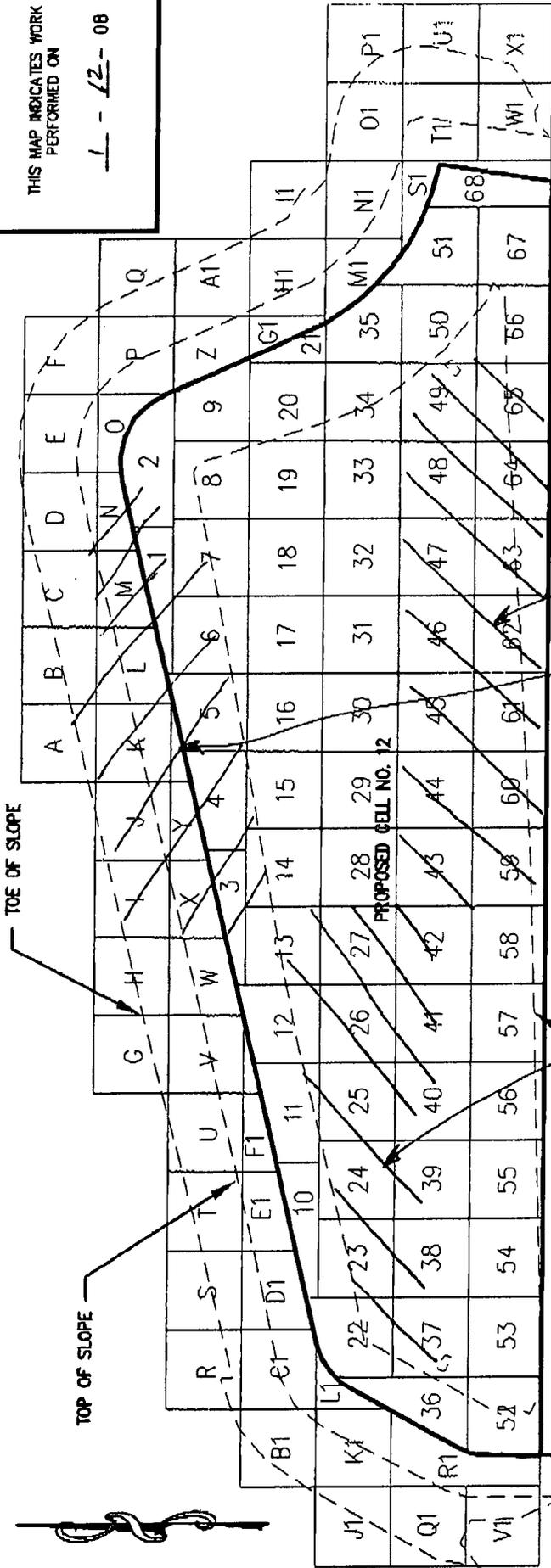
RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

L - 12 - 08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

26

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FINE GRADING ACTIVITY

PLACEMENT & COMPACTION OF STRUCTURAL FILL

FINE GRADING ACTIVITY

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



BRNWK:	AEH	DATE:	11-01-07	FIGURE	<b>1</b>
CHECKED:	JAG	CAD:	ECLF58-FSC112	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
APPROVED:		JOB NO:	J07-1001-58		

**IBL**  
**BUNNELL-LAMBSON ENGINEERING, INC.**  
 6004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)288-1265 FAX: (864)288-4430

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-13-98  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: 15  
WORK HOURS: 10.5

PROJECT DAY NO. 75

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 45 °F  
DAYTIME HIGH: 51 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
FINE GRADING THE CELL FLOOR.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLIN. DENSITY TESTS.

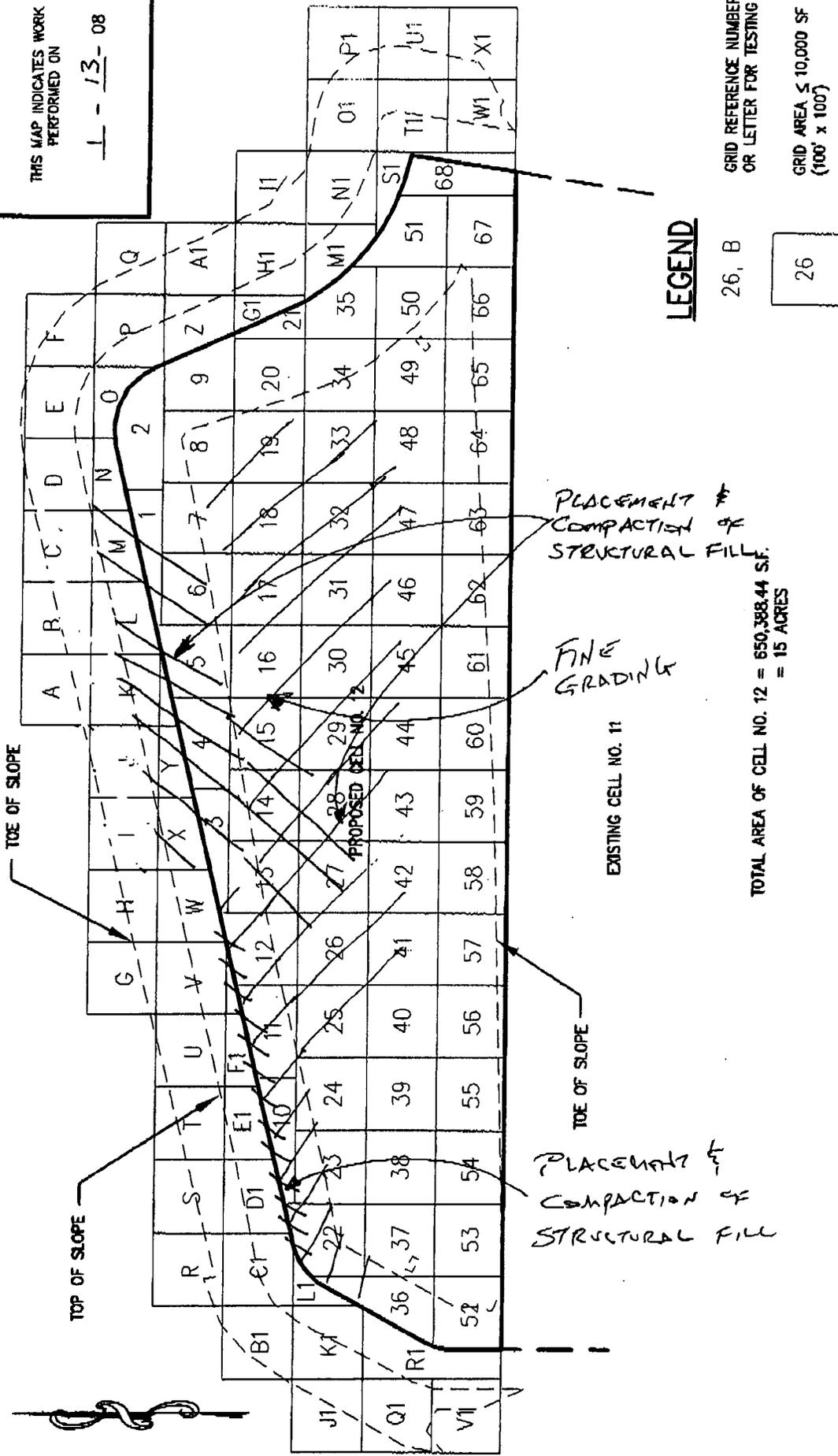
RECORD PREPARED BY:

Ted Stiles  
Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel Bunnell  
Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
 1 - 13 - 08



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

**IBLE** INC.  
 BUNNELL-JAMFONGS ENGINEERING, INC.  
 6004 POWERS COURT 28015  
 GREENVILLE SOUTH CAROLINA  
 PHONE: (843)288-1265 FAX: (843)288-4430



DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

FIGURE 1



**BUNNELL-LAMMONS ENGINEERING, INC.**

GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF SITE MEETING**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Meeting Date:** January 14, 2008

**Meeting Attendees:**

<u>NAME</u>	<u>FIRM</u>	<u>PHONE</u>
Mr. Bill Cooksey	East Carolina Regional MSW Landfill	(252) 348-3322
Mr. Ray Hoffman, P.E.	Republic Services of North Carolina, LLC	(828) 464-2414
Mr. Steve Nichting	Republic Services of North Carolina, LLC	(336) 364-3699
Mr. Bill Hodges, P.E.	Hodges, Harbin, Newberry & Tribble, Inc.	(912) 743-7175
Mr. Scott Newman	R. B. Baker Construction Company, Inc.	(912) 657-9336
Mr. Timmy Lee	R. B. Baker Construction Company, Inc.	(912) 667-2268
Mr. Jeff Helvey, P.E.	Bunnell-Lammons Engineering, Inc.	(864) 346-9882
Mr. Ted Stiles	Bunnell-Lammons Engineering, Inc.	(864) 201-5517
Mr. Dan Bunnell, P.E.	Bunnell-Lammons Engineering, Inc.	(864) 787-6085

The meeting was held in the offices of East Carolina Environmental. The following items provide a summary of the topics discussed.

1. Structural Fill: Scott Newman reported that approximately 40% complete (130,000 to 150,000 cy in place). Structural fill soils consist primarily of silty sand. Some clayey sands have been used, as well.
2. Clay: Approximately 20,000 cy of compacted clay liner had been excavated from the Tripp Borrow Area and stockpiled for use in construction of the compacted clay liner.
3. Piping: HDPE piping is on-site. Plastic Fusion Fabricators (PFF) has been sub-contracted to install the piping. Joints will be fusion welded.
4. Pumps: Mr. Newman reported that the pumps have been approved by Hodges, Harbin, Newberry and Tribble, Inc. (HHNT) and ordered by R. B. Baker Construction Company, Inc. (Baker) from Gunco.
5. HDPE Pipe Testing: Mr. Hodges noted that all required hydrostatic testing will be performed with the pipe on the trench with a minimum of 2 feet of cover (compacted). The pipe may be temporarily plugged at the connection to the manhole and hydrostatically tested prior to connection to the manhole.

The final manhole to pipe weld will be tested using the hydro static test at the time of the hydrostatic testing of the manhole.

6. Pump Station Rehab: Baker will submit a price for performance of the pump station rehabilitation.
7. Schedule: Scott Newman provided an updated construction schedule. Mr. Newman noted the change from the previous schedule being 15 days added to structural fill duration.
8. Partial Subgrade Survey: Wright and Fields Land Surveying, Inc. have been delayed until next week for performance of the partial subgrade survey. Portions of the subgrade require additional grading and compaction prior to subgrade acceptance and surveying.
9. Equipment: Baker currently has four articulated dump trucks in operation on-site and a fifth truck being repaired. Scott Newman noted that Baker plans to add to additional trucks to the project during clay installation. Two track hoes are currently in use on-site.
10. Sand Delivery: Approximately 6,100 cy (in-place volume) of clean fine to coarse sand are required for use in the cell. The majority if the material has been excavated and stockpiled at the sand pit. Bunnell-Lammons Engineering, Inc. (BLE) has sampled recommend acceptance of the borrow source for use on-site. BLE will obtain additional samples as the material is delivered. It was agreed that the sand delivery will begin and should be completed prior to Baker beginning clay installation.
11. Extra Costs: Baker summarized additional tasks beyond the base contract which would result in additional job costs.
  - a. Extra Ditching in Borrow Area: Baker will submit a cost estimate as soon as possible. Rough estimate is approximately 2 days of work.
  - b. Tripp Borrow Area Dividing Berm: Mr. Hodges directed that the berm be constructed of the "blue gumbo clay" and capped with approximately 5 feet of structural fill for a light-duty Service Road.
  - c. Staging Area: Bill Cooksey is to work with Timmy Lee to determine the location and size of the area.
12. Geomembrane: The project geomembrane has been approved, delivered and stockpiled on the job site. It was noted that the geomembrane delivered for rainflaps and rubsheets is off spec material. These rolls (6) have been marked and are in a separate stockpile. Ted Stiles has confirmed the roll inventory. Mr. Hodges noted that due to the size of the cell and the use of both textured and smooth liner in the cell configuration, the Geomembrane Pre-deployment Meeting will be an important meeting. Steve

Nichting will contact AEG, the tentative liner installer, and have them submit the pre-deployment figure for review by BLE and HHNT. A single mobilization is planned, however; no more than two mobilizations should be required. Mr. Nichting agreed to continue to work with the project team during liner coordination and installation. If the cell is broken into two subcells with two liner deployments, the western approximately 4-acres from the break point west should be installed initially so that the protective cover could be installed in this area and the subcell put into use. If 2 subcells are constructed and certified separately, a temporary earthen berm along the high point of the mid portion of the cell to separate the two subcells will be required. The potential for two subcells will be re-evaluated at the next site meeting.

13. Rainflap Construction: It was noted that the Cell No. 11 rainflaps did not extend high enough up the side slopes of the cell. Bill Cooksey will review the planned rainflap configuration and make a field determination during liner installation regarding how far the rainflaps extend up the side slopes. It is currently planned that the rainflaps are to be constructed in the locations designated on the drawings. It was also noted that the direction of the western rainflap will be opposite to the other rainflaps due to the floor grading. During the Pre-Deployment Meeting, the rainflap installation should be discussed and the welding prepared to minimize the potential for tearing of the base liner at the rainflaps on the upper portions of the side slopes. It may be necessary to make the final weld on the rainflap on the side slopes at the time that the rainflaps are folded over the protective cover temporary berms. This would require mobilization of a small liner crew with an extrusion welder and field tensiometer.
14. 6-osy Geotextile (Material actually on-site is nominal 8-osy): It was noted that the 6-osy material is to be installed underneath the entire protective cover area on the cell floor.
15. Soil Materials: Baker will continue to utilize the very silty fine to coarse sands for structural fill. The clay soils will be stockpiled for construction of the compacted clay liner and the cleaner, fine to coarse sands will be retained for use as protective cover. Mr. Stiles noted that the clay material that has been stockpiled is approximately 3 to 4% wet of the optimum moisture content, which is within the desired moisture window. Relatively minor moisture modification will be required during placement.
16. Stone:
  - a. No. 57 Stone: Mr. Cooksey obtained samples for grainsize and calcium carbonate analysis by BLE.
  - b. 78M Stone: It was agreed that the 78M stone will utilize the crushed granite angular rock due to its favorable angle and repose. Mr. Cooksey will obtain pricing for potential use of washed river rock, which is generally rounded or sub-rounded as a potential alternative.

17. Power: The site will provide electrical power to the control box. Mr. Cooksey will coordinate the installation.
18. Other Materials:
- a. GCL: Steve Nichting has prepared the order, but has not provided a purchase order at this time. Six rolls are required for East Carolina. It is planned to order both East Carolina and Uwharrie GCL at the same time. Mr. Cooksey noted that the GCL could be stored in the warehouse at East Carolina. It is planned to use CETCO GCL.
  - b. 24-osy Geotextile: Submittal required.
  - c. 6-osy Sock: Submittal on the SKAPS Industries material is required. Baker plans to heat bond the material on-site. It was recommended that the material be sewed. Baker agreed to look into obtaining a sewing machine. Scott Newman indicated that it is planned to have the material cut to 18-inch wide strips at the manufacturing plant for easier installation.
  - d. Clay Liner: Rone disc harrows will be used to process clay liner soils.
19. Grassing: Bill Cooksey will coordinate grassing, which is to be performed by the landfill.
20. 4" x 4" Marker Posts with Decals: Bill Cooksey will coordinate obtaining these 4" x 4" posts for installation by Baker. The landfill will provide the posts and decals.
21. Next Meeting: Next meeting was scheduled for Tuesday, February 19, 2008 on-site at 11:00 a.m.

Recorded by:



Daniel B. Bunnell, P.E.  
Project CQA Engineer  
Registered, NC No. 13814

Distribution: Meeting Attendees



**BUNNELL-LAMMONS ENGINEERING, INC.**

GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF SITE OBSERVATIONS**

**CONSTRUCTION OF CELL NO. 12**

**EAST CAROLINA REGIONAL MSW LANDFILL**

**BERTIE COUNTY, NORTH CAROLINA**

**BLE Project No. J07-1001-58**

**Date of Observations:** January 14, 2008

**Observations by:**

<u>NAME</u>	<u>FIRM</u>	<u>PHONE</u>
Mr. Bill Cooksey	East Carolina Regional MSW Landfill	(252) 348-3322
Mr. Ray Hoffman, P.E.	Republic Services of North Carolina, LLC	(828) 464-2414
Mr. Bill Hodges, P.E.	Hodges, Harbin, Newberry & Tribble, Inc.	(912) 743-7175
Mr. Dan Bunnell, P.E.	Bunnell-Lammons Engineering, Inc.	(864) 787-6085

The meeting attendees were met and accompanied at the site by Mr. Scott Newman and Mr. Timmy Lee of R. B. Baker Construction Company, Inc. (Baker), the project general contractor and Mr. Ted Stiles, the on-site Bunnell-Lammons Engineering, Inc. (BLE) CQA engineering technician. The above parties observed the Tripp Borrow Area, the Cell No. 12 construction area, and the material lay down yard.

Baker was in the process of excavating structural fill material from the Tripp Borrow Area and transporting it for placement into the structural fill of the earthen berm along the north edge of Cell No. 12. Excavation was being performed utilizing a track excavator. Material was being transported in articulated haul trucks, spread in the fill utilizing a bull dozer and compacted with overlapping tracks of a Caterpillar 815 footed compactor.

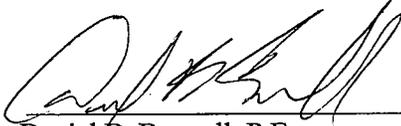
The western portion of the cell floor had been constructed to approximately the subgrade elevation. Some fine grading remained to be performed. In addition, some areas required additional compaction. Baker may choose to over-excavate some surficial wet soils and replace them with drier materials prior to compaction or to perform in-place moisture modification.

Baker indicated that the western portion of the cell floor will be ready for the subgrade as-built survey sometime early next week (approximately January 22<sup>nd</sup> or 23<sup>rd</sup>, 2008).

It was noted that the borrow soil management and dewatering within the Tripp Borrow Area was being performed in accordance with previous project discussions. The surface of the borrow area was uniform and the existing ditches appeared to be adequately dewatering the excavation area.

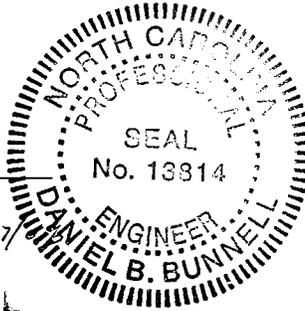
In conclusion, the excavation within the Tripp Borrow Area and the Cell No. 12 construction was noted to be in conformance with the project plans and CQA Manual.

Recorded by:



Daniel B. Bunnell, P.E.  
Project CQA Engineer  
Registered, NC No. 13814

1/17/08



Distribution: Bill Cooksey  
Steve Nichting  
Ray Hoffman, P.E.  
Bill Hodges, P.E.  
Scott Newman  
Jeff Helvey, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-14-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 6:00 PM  
LUNCH BREAK: .5  
WORK HOURS: 11.0

PROJECT DAY NO. 71

VISITORS:

NAME REPRESENTING

BILL HODGES PE H.H.N. & T.  
RAY HOFFMAN PE REPUBLIC  
SCOTT NEWMAN R.B. BAKER  
STEVE NICHING REPUBLIC

ONSITE BLE PERSONNEL: TED STILES  
DAN BUNNELL PE  
JEFF HELVIG PE

WEATHER: SUNNY CLOUDY WINDY  
SLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 39 °F  
DAYTIME HIGH: 55 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

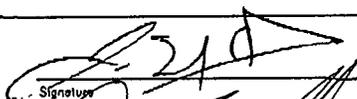
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
FINE GRADING ACTIVITY IN THE WEST END OF THE CELL  
PROJECT MEETING ON SITE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

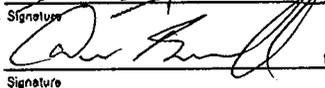
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
NUCLEAR DENSITY TESTS.  
PERFORMED TWENTY THREE NUCLEAR DENSITY TESTS AT SUBGRADE.  
PERFORMED ONE DRIVE CYLINDER CALIBRATION TEST. SEE ATTACHED  
CALIBRATION DATA SHEET.

RECORD PREPARED BY:

  
Signature

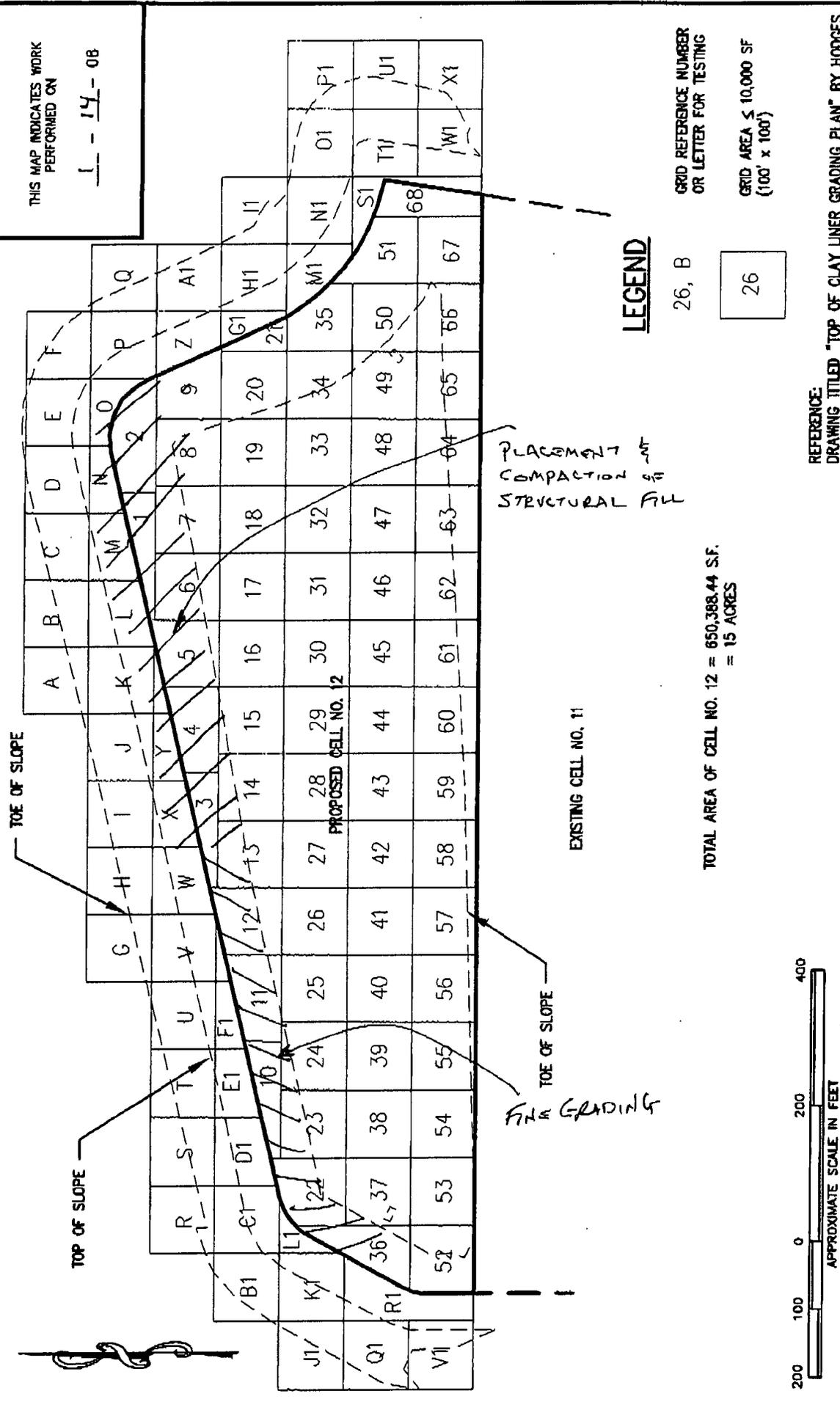
TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
 11-14-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26, B  
 GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )  
 26

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
 = 15 ACRES



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07	FIGURE:	1
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
APPROVED:	J07-1001-58	 <b>IBL</b> INC. SUNNELL-LAUNDRON ENGINEERING, INC. 6004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)288-1285 FAX: (864)288-4430			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-15-08

PROJECT DAY NO. 72

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: 1.5

WORK HOURS: 11.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER:

AM SUNNY  
PM WINDY  
MIXED CLOUDY

CLOUDY

RAIN

WINDY

TEMPERATURE:

MORNING LOW: 32 °F

DAYTIME HIGH: 51 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION

COMPACTED CLAY LINER

STRUCTURAL FILL

LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVING WASHED PROTECTIVE COVER MATERIAL. THE MATERIAL IS BEING STOCKPILED NORTH OF CELL 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLINDER DENSITY TESTS.  
PERFORMED NUCLEAR DENSITY TESTS AT SURGRADE.  
PERFORMED ONE DRIVE CYLINDER CALIBRATION TEST.

RECORD PREPARED BY:

*Ted Stiles*  
Signature

TED STILES

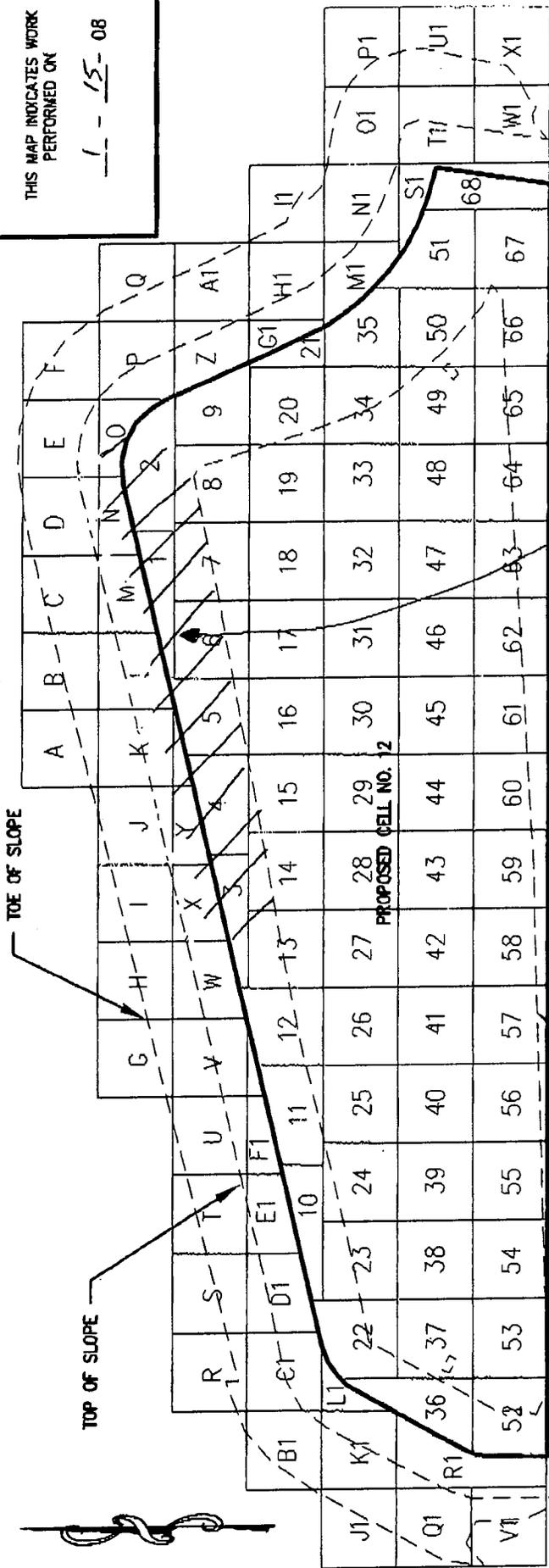
RECORD REVIEWED & APPROVED BY:

*Daniel B. Bunnell*  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

1 - 15 - 08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.



EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

FIGURE

1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL**  
RUMBLE-LAMMONS ENGINEERING, INC.  
1004 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1265 FAX: (864)288-4430

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-16-08

PROJECT DAY NO. 73

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PRY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 28 °F  
 DAYTIME HIGH: 44 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVING WASHED PROTECTIVE COVER MATERIAL.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL, PERFORMED  
DRIVE CYLINDER DENSITY TESTS.  
COLLECTED ONE SAMPLE OF WASHED PROTECTIVE COVER MATERIAL.  
 \_\_\_\_\_  
 \_\_\_\_\_

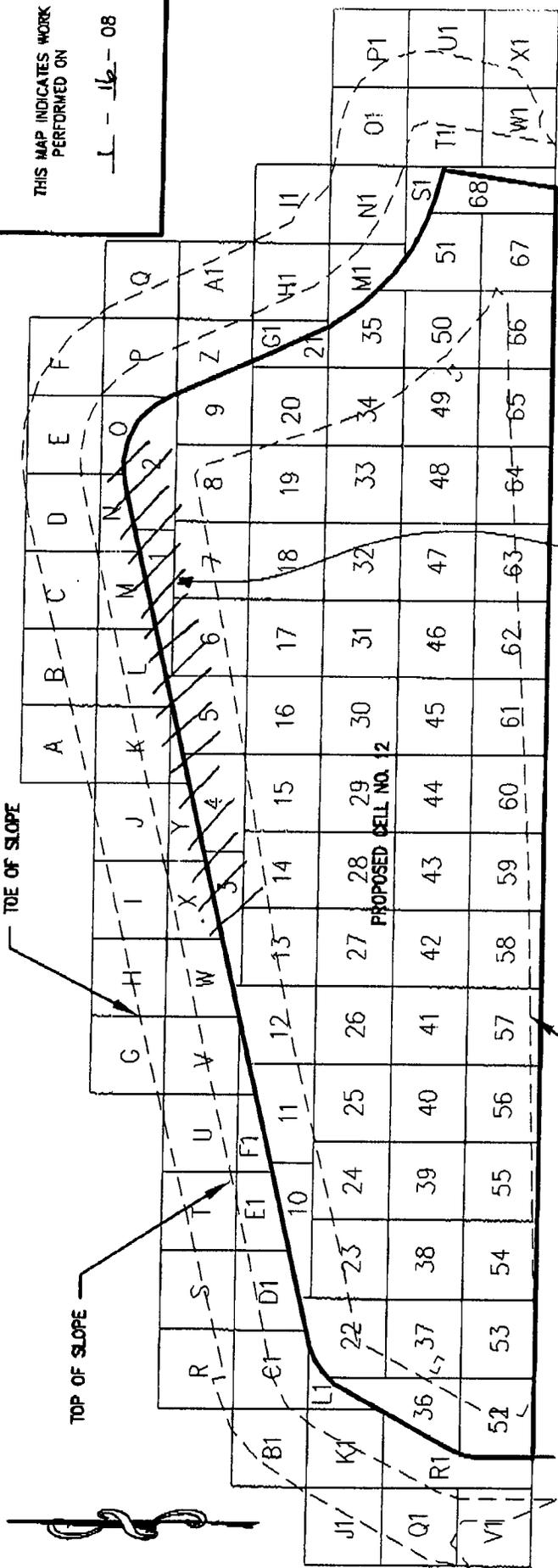
RECORD PREPARED BY:

TED STILES  
 Signature

RECORD REVIEWED & APPROVED BY:

DANIEL B. BUNNELL, P.E.  
 Signature

THIS MAP INDICATES WORK PERFORMED ON  
L - 16 - 08



**LEGEND**

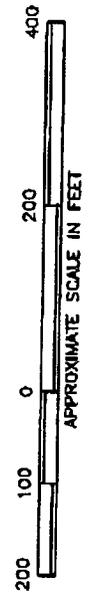
GRID REFERENCE NUMBER OR LETTER FOR TESTING  
26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 850,388.44 SF.  
= 15 ACRES

EXISTING CELL NO. 11



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC112
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
BUNNELL-LAWRENCE ENGINEERS, INC.  
6004 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1215 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-17-08

PROJECT DAY NO. 74

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 12:00 PM

LUNCH BREAK: -

WORK HOURS: 5.5

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 39 °F  
DAYTIME HIGH: 50 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
LIGHT RAINFALL AT 7:00. STEADY RAINFALL ON/OFF BEGAN AT  
10:15 AM. ALL WORK HALTED AT 12:00.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

RECORD PREPARED BY:

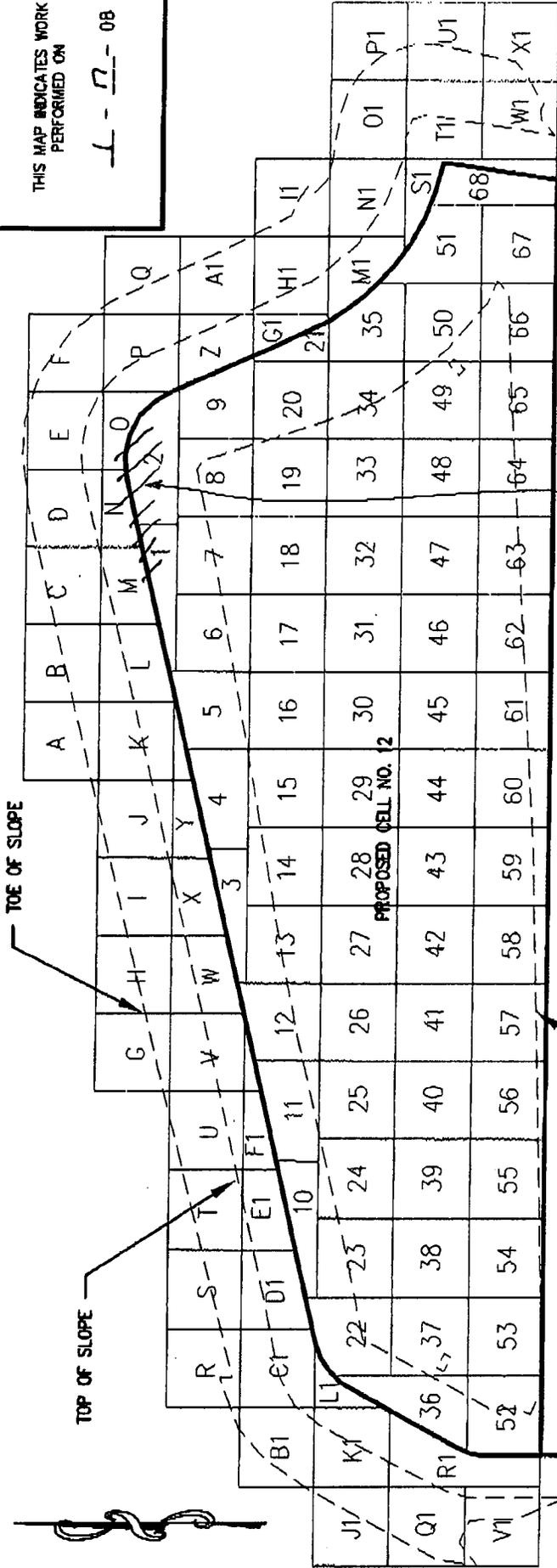
TED STILES  
Signature

RECORD REVIEWED & APPROVED BY:

DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON

L-17-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07
CHECKED: JAG	CAD: ECLF58-FSC112
APPROVED:	JOB NO: J07-1001-58

**IBL** INC.  
**BURMELL-LAMBSONS ENGINEERING, INC.**  
 604 FARMERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)286-1288 FAX: (864)286-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-18-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 5:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 10.5

PROJECT DAY NO. 75

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 RTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 36 °F  
 DAYTIME HIGH: 58 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
YESTERDAY'S RAINFALL TOTAL WAS 0.5".  
FINE GRADING THE NORTH SLOPE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

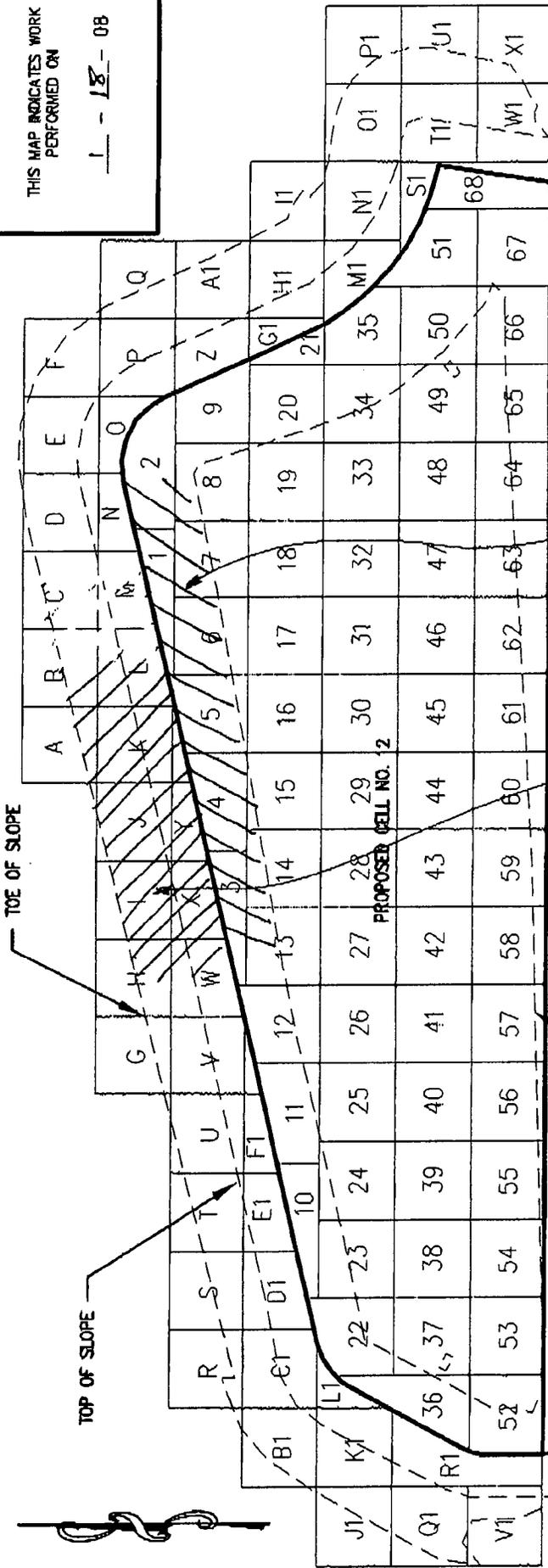
**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY: TED STILES  
 Signature \_\_\_\_\_  
 RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
 Signature \_\_\_\_\_

THIS MAP INDICATES WORK PERFORMED ON

L - 18 - 08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

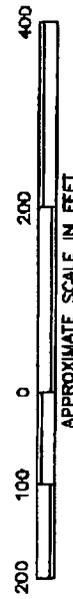
GRID AREA  $\leq 10,000$  SF (100' x 100')

26, B

26

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07	FIGURE	<b>1</b>	
CHECKED:	JAG	CAU:	ECLF58-FSC12	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA		
APPROVED:		JOB NO:	J07-1001-58			



TOTAL AREA OF CELL NO. 12 = 850,388.44 S.F.  
= 15 ACRES

EXISTING CELL NO. 5111  
STRUCTURAL FILL  
PLACEMENT  
COMPACTION & AT

FINE GRADING

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.  
 DATE: 1-19-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 12:30 PM  
 LUNCH BREAK: -  
 WORK HOURS: 6-0  
 ON-SITE PERSONNEL: TED STILES

PROJECT DAY NO. 76  
 VISITORS:  
 NAME REPRESENTING

WEATHER: SUNNY  CLOUDY WINDY   
 PTLY CLOUDY  RAIN   
 EQUIPMENT SEE WEEKLY EQUIPMENT LIST

TEMPERATURE:  
 MORNING LOW: 39 °F  
 DAYTIME HIGH: 45 °F

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DRAINAGE ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
LIGHT RAIN BEGAN FALLING AT 8:30 AM. ALL WORK HALTED  
BY 12:00 PM.

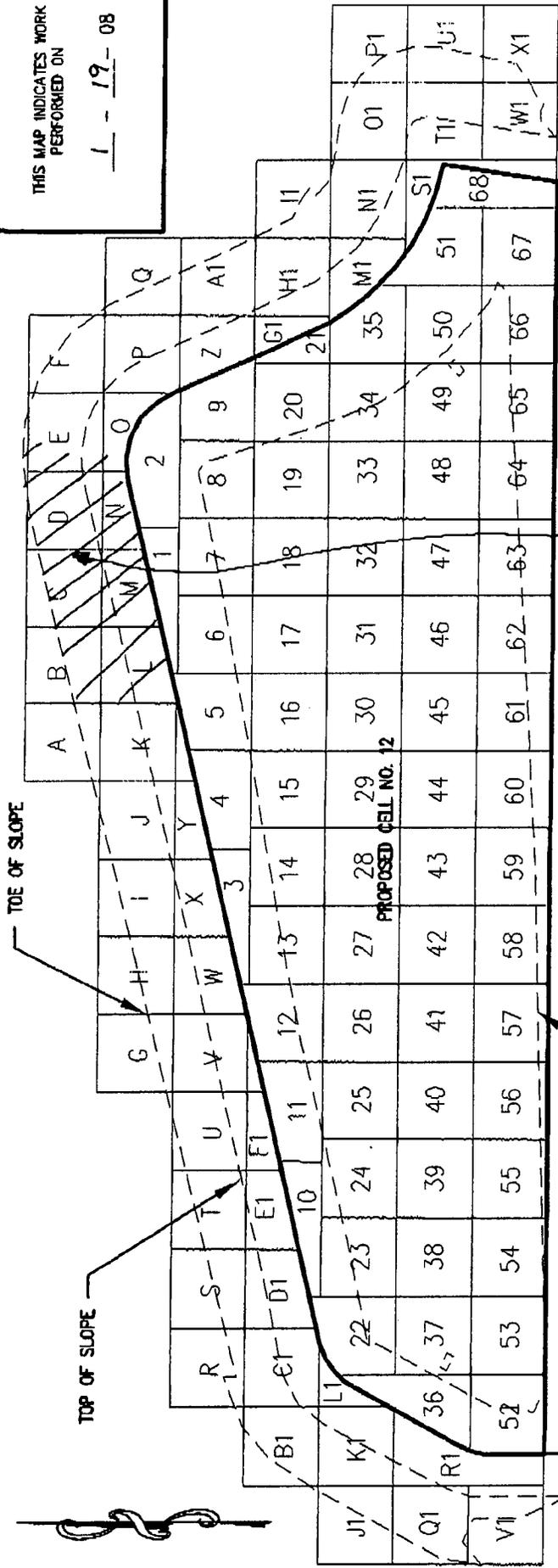
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY: TED STILES  
 Signature: [Signature]  
 RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
 Signature: [Signature]

THIS MAP INDICATES WORK PERFORMED ON  
1 - 19 - 08



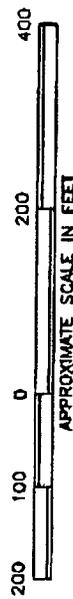
PLACEMENT & COMPACTION OF STRUCTURAL FILL

EXISTING CELL NO. 11

**LEGEND**

- 26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING
- 26 GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
BURNELL-LAWSON ENGINEERING, INC.  
8004 ROUNDS COUNTRY  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)258-1285 FAX: (864)258-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-25-08

PROJECT DAY NO. 77

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 12:30 PM

LUNCH BREAK: —

WORK HOURS: 4.0

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER:  SUNNY     CLOUDY     WINDY  
 PTRY CLOUDY     RAIN

TEMPERATURE:  
 MORNING LOW: 22 °F  
 DAYTIME HIGH: 35 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION     COMPACTED CLAY LINER   
 STRUCTURAL FILL     LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

YESTERDAY'S RAINFALL TOTAL WAS MEASURED AT 0.5".  
ONE DOZIER BLADING THE HAUL ROAD AND FILL AREA.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

RECORD PREPARED BY:  TED STILES  
 RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-21-08

PROJECT DAY NO. 78

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
 PLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 18 °F  
 DAYTIME HIGH: 41 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION	<input type="checkbox"/>	COMPACTED CLAY LINER	<input type="checkbox"/>
STRUCTURAL FILL	<input checked="" type="checkbox"/>	LEACHATE COLLECTION	<input type="checkbox"/>

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
EXCAVATION AND REMOVAL OF WET SOILS AT SUBGRADE IN  
THE CELL FLOOR.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

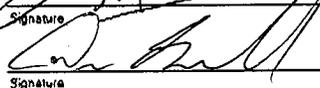
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL, PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:

  
 Signature

TED STILES

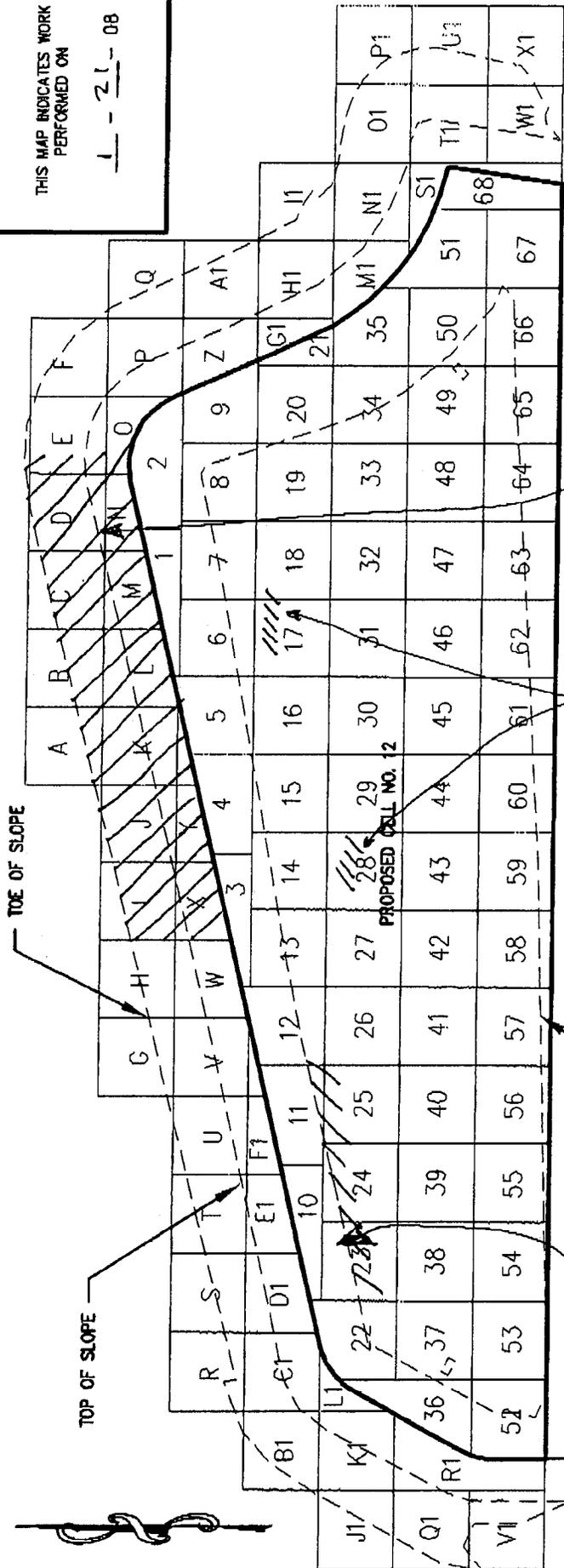
RECORD REVIEWED & APPROVED BY:

  
 Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

1-21-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26 GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE	<b>1</b>		
FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA			
<b>BLE</b> BUNNELL-LAUBSONG ENGINEERING, INC. 6004 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)258-1265 FAX: (864)258-4430	DATE	11-01-07	
DRAWN: AEH	CAD:	ECLF58-FSCCELL12	
CHECKED: JAG	JOB NO:	J07-1001-58	
APPROVED:			

PLACEMENT & COMPACTION OF STRUCTURAL FILL

EXCAVATION OF WET SOILS

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-22-08

PROJECT DAY NO. 79

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:20 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

TOMMY FIELDS, PLS W&F SURVEYING.

WEATHER: SUNNY  CLOUDY  WINDY   
 PLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 28 °F  
DAYTIME HIGH: 47 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

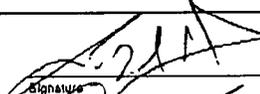
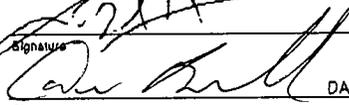
**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
TOMMY FIELDS IS ON SITE PERFORMING THE SUBGRADE AS-BUILT.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.  
PERFORMED EIGHT DRIVE CYLINDER DENSITY TESTS AT SUBGRADE.

RECORD PREPARED BY:  TED STILES  
 RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.



**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-23-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:00 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 11.0

PROJECT DAY NO. 80

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 43 °F  
 DAYTIME HIGH: 53 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

OVERNIGHT RAINFALL WAS MEASURED AT 0.2" .  
DAILY DRAINAGE ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
TOMMY FIELDS HAS COMPLETED THE AS-BUILT ON THE PREPARED  
SUBGRADE.

CONTRACTOR/CQA MEETING: CLAY LINER PLACEMENT WILL NOT BEGIN UNTIL  
H.H.N. & T. HAS APPROVED THE AS-BUILT.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS

RECORD PREPARED BY: \_\_\_\_\_ TED STILES

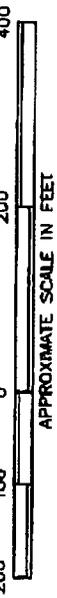
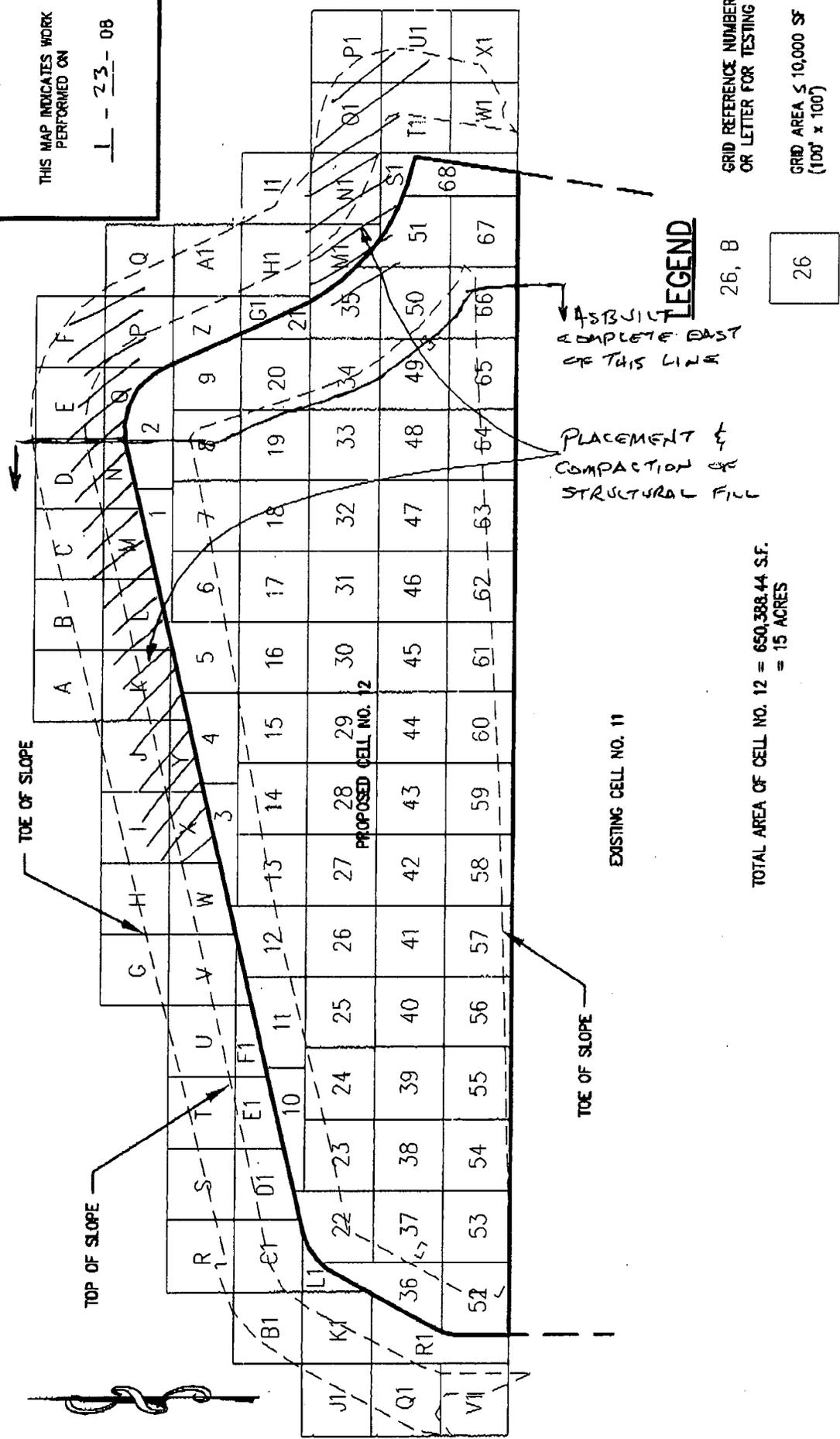
*[Handwritten Signature]*  
 Signature

RECORD REVIEWED & APPROVED BY: \_\_\_\_\_ DANIEL B. BUNNELL, P.E.

*[Handwritten Signature]*  
 Signature

THIS MAP INDICATES WORK PERFORMED ON

L - 23 - 08



TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07
DESIGNED BY:	ECLF56-FSC12
CHECKED BY:	JAG
APPROVED BY:	J07-1001-58
FIGURE:	1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL**  
BURRELL-LAMBORN ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: (864)288-4430

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-24-88

PROJECT DAY NO. 81

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
Pm PTLY CLOUDY AM RAIN

TEMPERATURE:  
MORNING LOW: 36 °F  
DAYTIME HIGH: 54 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

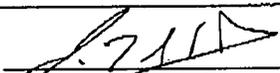
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PLACEMENT OF WET SOILS IN THE EAST BERM. THIS MATERIAL WILL  
BE DISCED TO DRY PRIOR TO COMPACTION.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

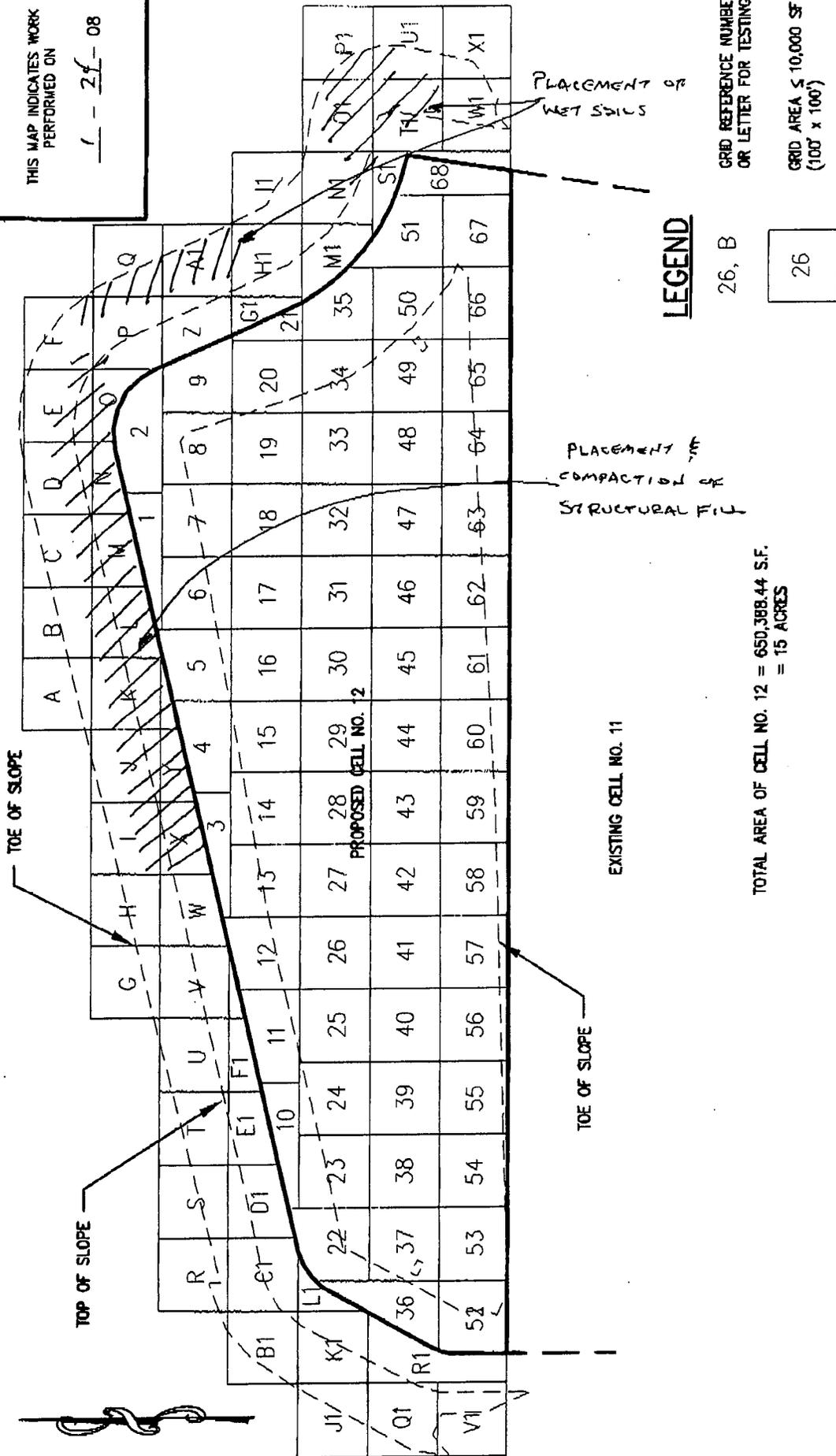
RECORD PREPARED BY:

  
Signature TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 1 - 26 - 08



**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: ECLF58-FSCCELL12 JOB NO: J07-1001-58		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <b>1</b>
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**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 125-08

PROJECT DAY NO. 82

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: 5

WORK HOURS: 10.5

ONSITE BLE PERSONNEL: TED STILES

VISITORS:  
 NAME REPRESENTING

WEATHER: SUNNY CLOUDY WINDY  
 PTLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 27 °F  
 DAYTIME HIGH: 44 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DENATURING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

CONTRACTOR/CQA MEETING: COMPACTED CLAY LINER (SECTION 02250, PAGE 5, PARAGRAPH I) NO SELECT FILL SHALL BE PLACED OR COMPACTED DURING SUSTAINED PERIODS OF TEMPERATURES BELOW 32°F. SELECT FILL MAY NOT BE PLACED DURING FREEZING CONDITIONS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL PERFORMED  
ACCEPTANCE OF THE SUBGRADE ASBUILT HAS BEEN CONFIRMED WITH MATT CHEEK AND JEFF HELVEY.

RECORD PREPARED BY:

Ted Stiles  
 Signature

TED STILES

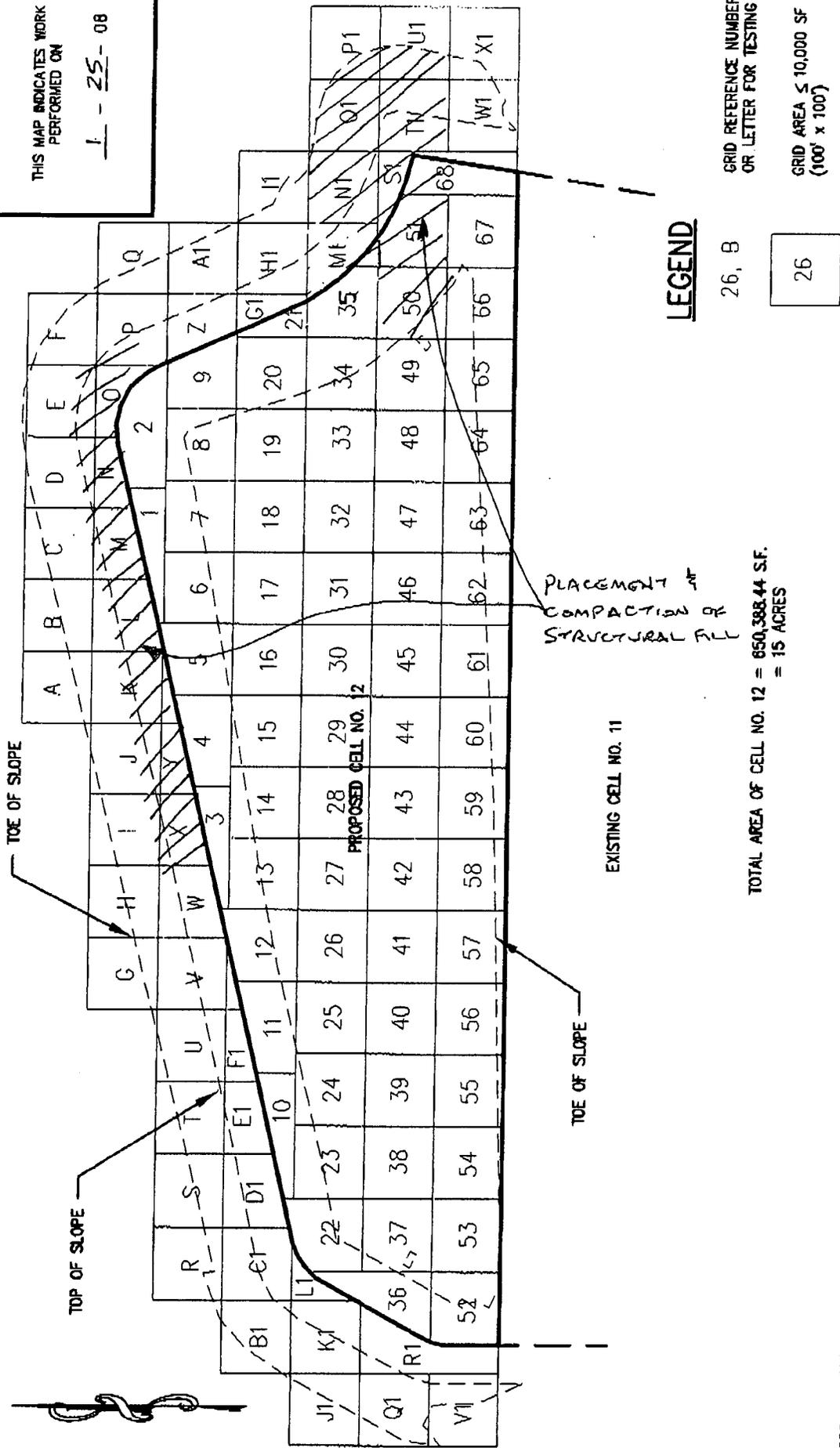
RECORD REVIEWED & APPROVED BY:

Daniel Bunnell  
 Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

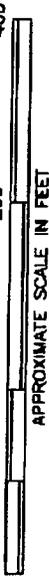
I - 25 - 08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26 GRID AREA  $\leq 10,000$  SF (100' x 100')



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

EXISTING CELL NO. 11

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
BURNELL-LAMMONS ENGINEERING, INC.  
604 SOUTHSIDE COURT  
GREENSBORO, SOUTH CAROLINA 29115  
PHONE: (803) 688-1288 FAX: (803) 288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-26-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 11.5

PROJECT DAY NO. 83

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
 PTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 28 °F  
 DAYTIME HIGH: 50 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF THE FIRST LIFT OF CLAY LINER  
MATERIAL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF CLAY LINER MATERIAL.  
PERFORMED NUCLEAR DENSITY TEST, SIX FIELD GRAIN SIZE TESTS  
AND COLLECTED THREE PERMEABILITY SAMPLES.  
PERFORMED ONE DRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY:

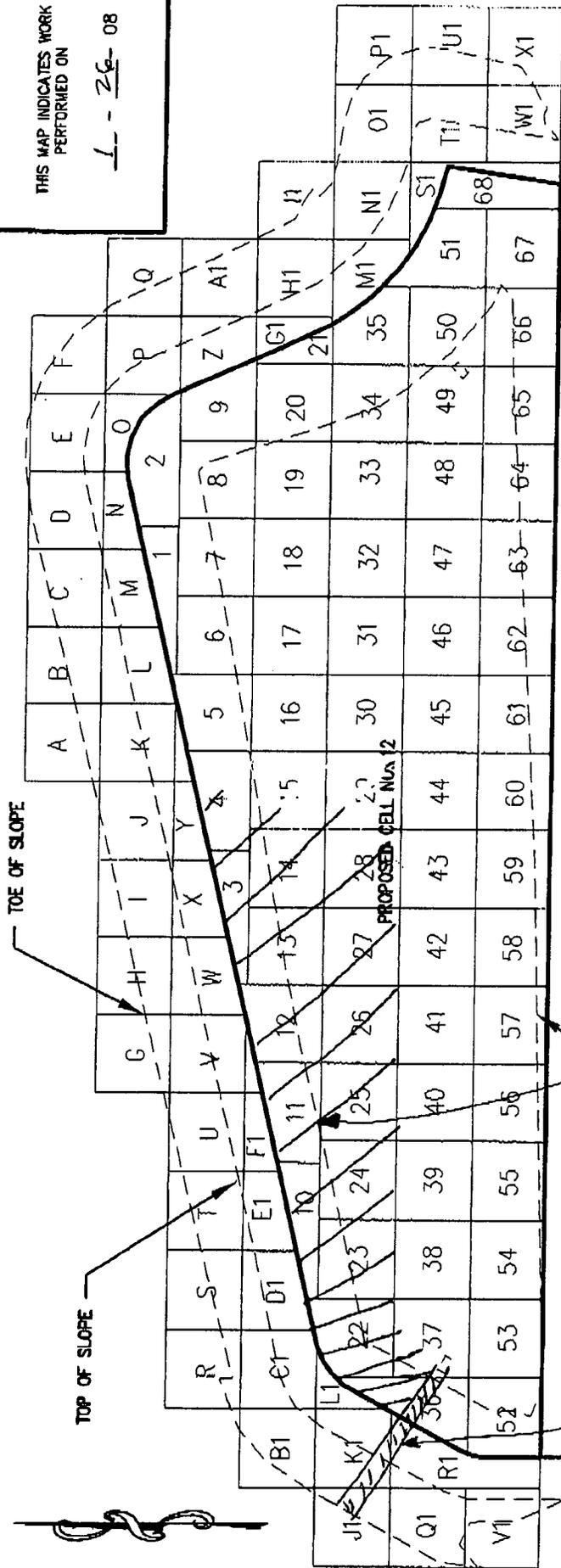
TED STILES  
 Signature

RECORD REVIEWED & APPROVED BY:

DANIEL B. BUNNELL, P.E.  
 Signature

THIS MAP INDICATES WORK PERFORMED ON

L - 26 - 08



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

EXISTING CELL NO. 11

PLACEMENT OF COMPACTION OF THE FIRST LIFT OF CLAY LINER



DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECUF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**BLE**  
 BUNNELL-LAMBSONS ENGINEERING, INC.  
 6004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**EQUIPMENT OF PROJECT**  
**CONSTRUCTION QUALITY ASSURANCE - CELL 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-1001-38

Page 1 of 1

EQUIPMENT	DATE / DAY							COMMENTS
	1-20-08	1-21-08	1-22-08	1-23-08	1-24-08	1-25-08	1-26-08	
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
CAT. D6N LGP DOZIER	2	2	2	2	2	2	2	
ARTICULATING VOLVO A30D OFF ROAD	5	5	7 (H)	7	7	7	7	(H) RECEIVED 2 TRUCKS
CAT. 815 F COMPACTOR	1	1	1	1	1	1	1	
WHEEL DOZIER	1	1	1	1	1	1	1	
WALSH EC360B EXCAVATOR	1	1	1	1	1	1	1	
CAT 330 EXCAVATOR	1	1	1	1	1	1	1	
5000 GALLON WATER TANKER	1	1	1	1	1	1	1	
GENERAL SMOOTH DRUM ROAD SOILS COMPACTOR	1	1	1	1	1	1	1	

\* THE FIFTH TRUCK WAS REPAIRED ON 1-16-08

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-27-08

PROJECT DAY NO. 84

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: 0.5

WORK HOURS: 11.5

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: (SUNNY) CLOUDY WINDY  
 PLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 33 °F  
 DAYTIME HIGH: 48 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF THE FIRST LIFT OF CLAY LINER  
MATERIAL.

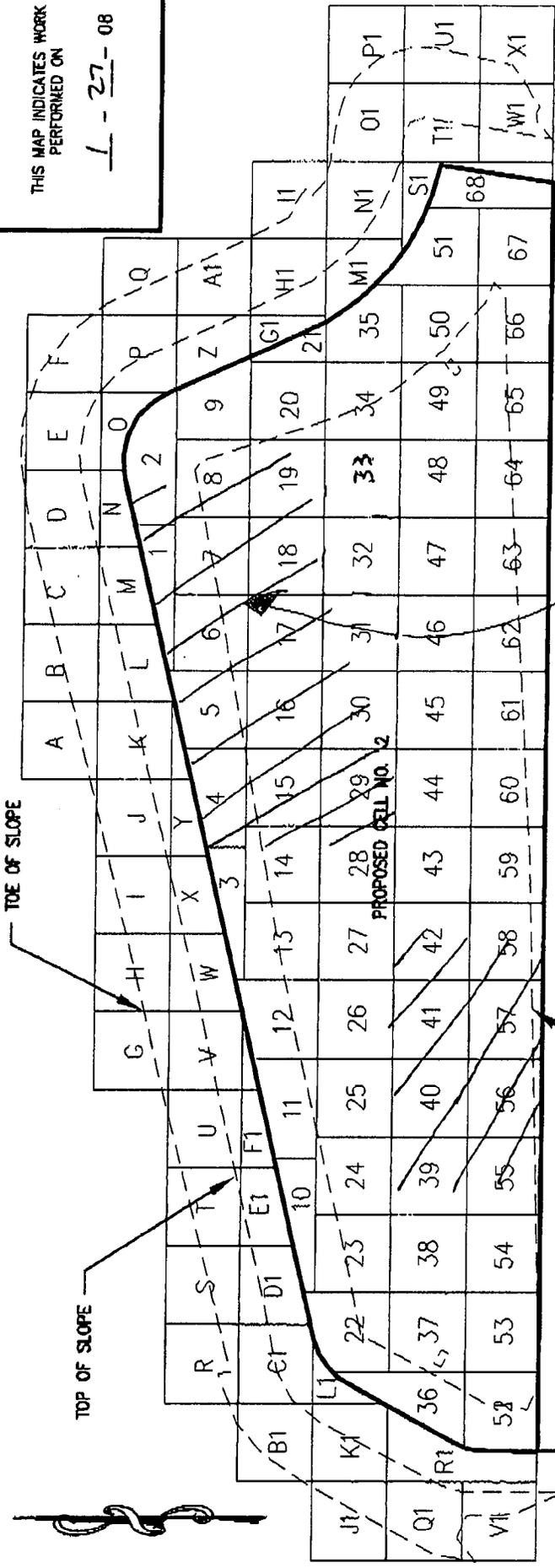
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF CLAY LINER MATERIAL.  
PERFORMED NUCLEAR DENSITY TESTS, TEN FIELD GRAIN SIZES,  
AND COLLECTED FOUR PERMEABILITY SAMPLES.  
PERFORMED DRIVE CYLINDER CALIBRATION TEST.

RECORD PREPARED BY: TED STILES  
 Signature  
 RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
 Signature

THIS MAP INDICATES WORK PERFORMED ON  
 L-27-08



**LEGEND**

26, B      GRID REFERENCE NUMBER OR LETTER FOR TESTING

26      GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
 = 15 ACRES

REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF5B-FSCCELL12
APPROVED:		JOB NO:	J07-1001-5B

**IBL**  
 BUNNELL-LAWSON ENGINEERING, INC.  
 6004 PONDERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTE COUNTY, NORTH CAROLINA

FIGURE  
**1**

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-28-98

PROJECT DAY NO. 85

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: 1.5

WORK HOURS: 11.5

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 28 °F  
 DAYTIME HIGH: 52 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

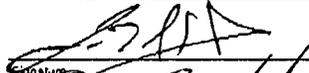
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF THE FIRST LIFT OF CLAY LINER  
MATERIAL.  
MAINTAINING MOISTURE CONTENT OF THE IN PLACE CLAY  
LINER MATERIAL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

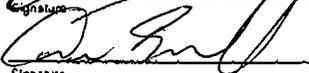
**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF CLAY LINER MATERIAL.  
PERFORMED NUCLEAR DENSITY TESTS, SEVEN FIELD GRAIN SIZES  
AND COLLECTED THREE PERMEABILITY SAMPLES.  
PERFORMED DRIVE CYLINDER CALIBRATION TEST.

RECORD PREPARED BY:

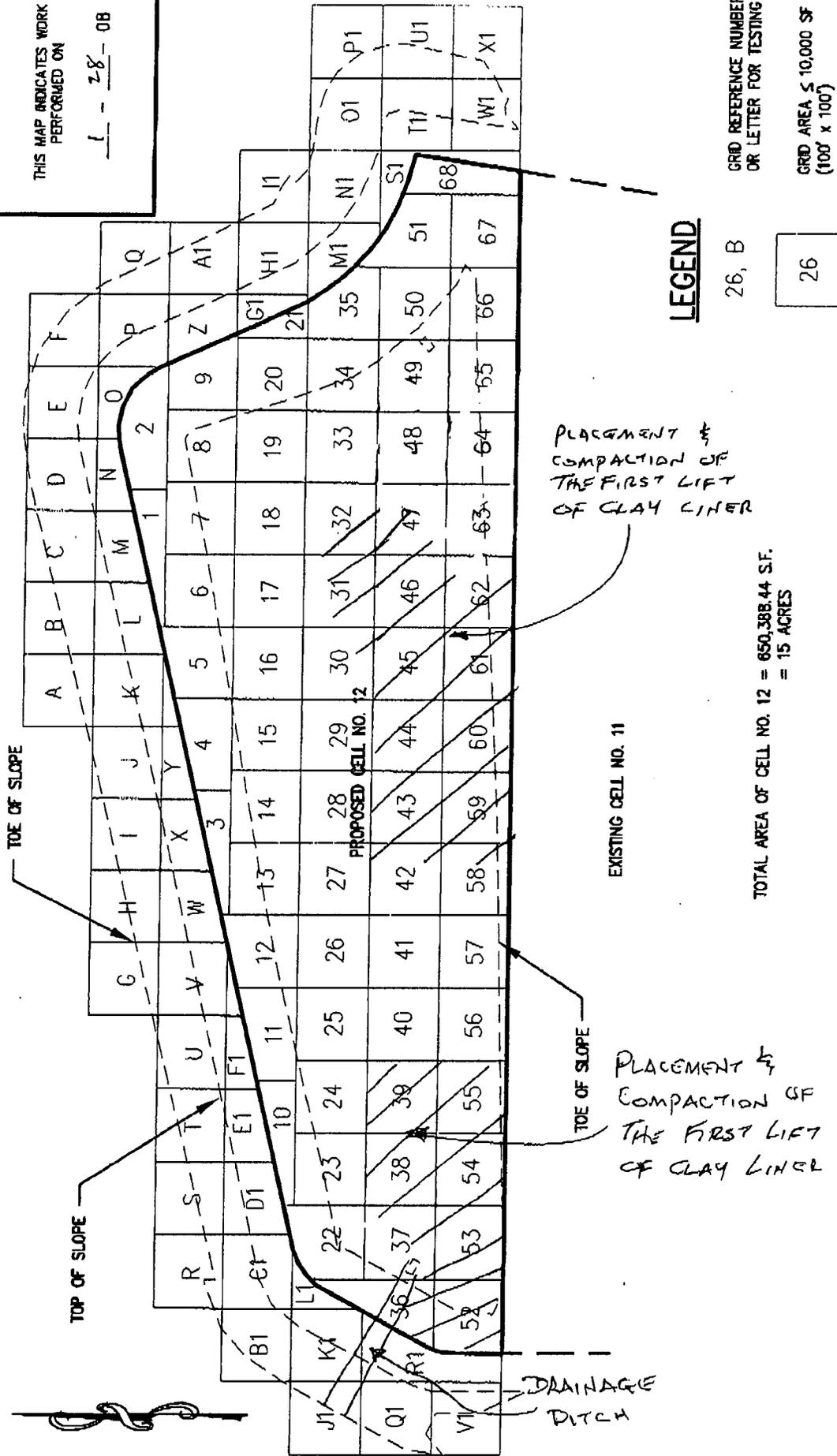
  
 \_\_\_\_\_  
 TED STILES

RECORD REVIEWED & APPROVED BY:

  
 \_\_\_\_\_  
 DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

L - 28 - 08



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq$  10,000 SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL** INC.  
RUSSELL LAUNDRING ENGINEERING, INC.  
6004 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE (864)258-1285 FAX (864)258-4439

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC12
APPROVED:		JOB NO:	J07-1001-58



TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-29-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 11.5

PROJECT DAY NO. 86

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

VISITORS:  
 NAME REPRESENTING  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
 PTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 35 °F  
 DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
COMPACTION OF THE FIRST LIFT OF CLAY LINER MATERIAL.  
PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY LINER MATERIAL.  
MAINTAINING MOISTURE CONTENT OF THE IN PLACE CLAY LINER.  
ROOT PICKERS ARE ON SITE.  
BLADING AND SEALING ALL FILL AREAS. RAIN IS FORECAST OVER NIGHT.  
CONTRACTOR/COA MEETING: CLAY LINER MATERIAL QUANTITY IN THE TRIPP PROPERTY BORROW AREA.  
 QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED COMPACTION OF THE FIRST LIFT OF CLAY LINER MATERIAL.  
PERFORMED NUCLEAR DENSITY TESTS, THREE FIELD GRAIN SIZES AND COLLECTED TWO PERMEABILITY SAMPLES.  
MONITORED PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY LINER.  
PERFORMED NUCLEAR DENSITY TESTS, SEVEN FIELD GRAIN SIZES AND COLLECTED THREE PERMEABILITY SAMPLES.  
PERFORMED DRIVE CYLINDER CALIBRATION TESTS.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

1 - 29 - 08

TOE OF SLOPE

TOP OF SLOPE

PROPOSED CELL NO. 12

EXISTING CELL NO. 11

COMPACTION OF THE FIRST LIFT OF CLAY LINER

PLACEMENT & COMPACTION OF THE SECOND LIFT OF CLAY LINER

DRAINAGE DITCH

**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26 GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

**IBL** INC.  
**BUNNELL-LANSON ENGINEERING, INC.**  
 8004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-1430

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC0112
APPROVED:		JOB NO.:	J07-1001-58

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-66

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-30-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 9:30 PM  
 LUNCH BREAK: 1.0  
 WORK HOURS: 9.0

PROJECT DAY NO. 87

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

VISITORS:  
 NAME REPRESENTING  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: PM SUNNY AM CLOUDY WINDY  
 PLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 55 °F  
 DAYTIME HIGH: 56 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

OVERNIGHT RAIN FALL WAS MEASURED AT 0.6". LIGHT RAIN FALL IS  
FORECAST THIS MORNING.  
PERFORMING MAINTENANCE ON EQUIPMENT THIS MORNING.  
COMPACTION OF THE SECOND LIFT OF CLAY LINER MATERIAL.  
BLADING HAUL ROADS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

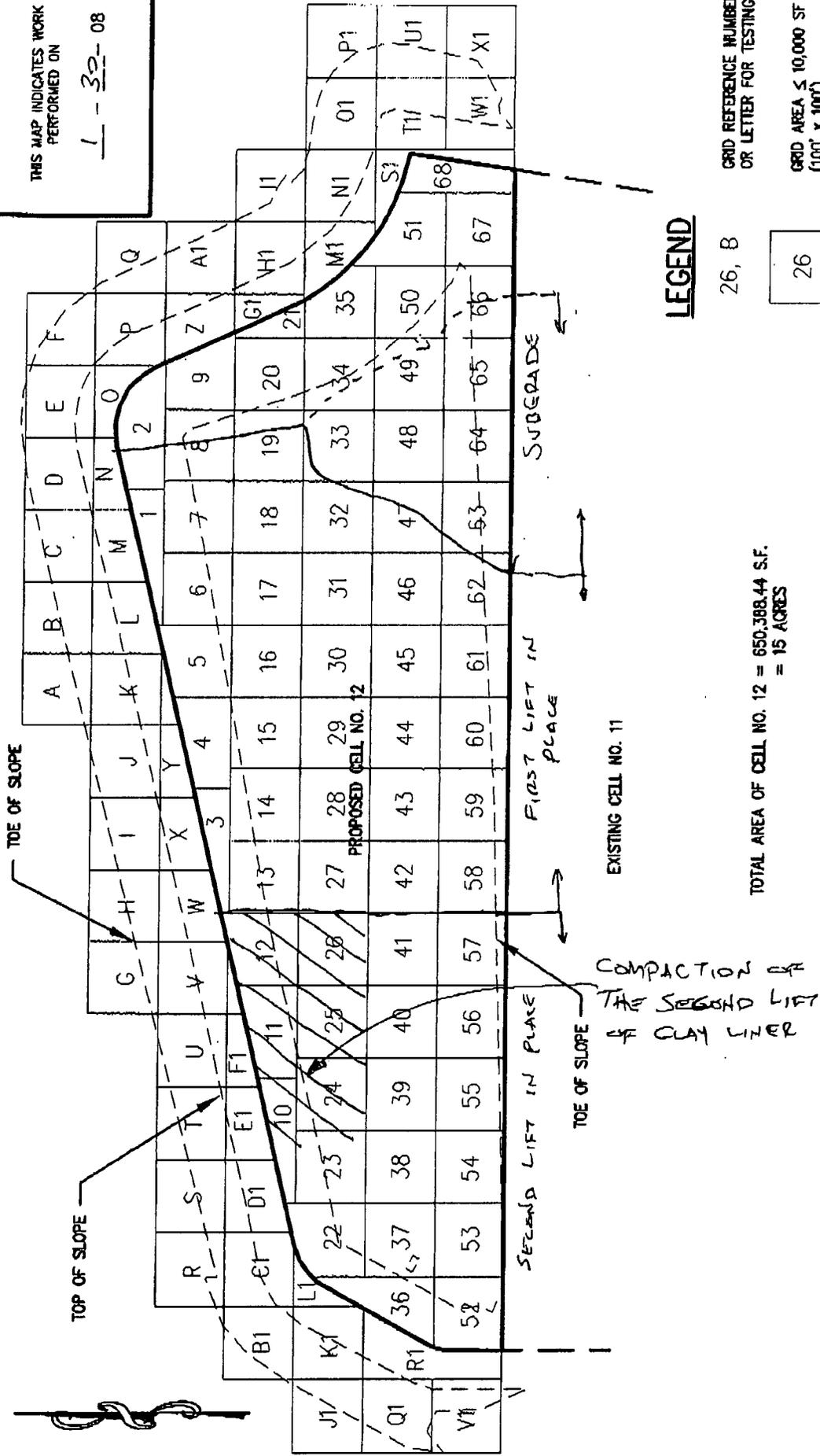
**TECHNICIAN ACTIVITIES:**

MONITORED COMPACTION OF THE SECOND LIFT OF CLAY LINER.  
PERFORMED NUCLEAR DENSITY TESTS, THREE FIELD GRAIN SIZES  
AND COLLECTED TWO PERMEABILITY SAMPLES.  
PERFORMED DRIVE CYLINDER CALIBRATION TEST.

RECORD PREPARED BY: TED STILES  
 Signature  
 RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
 Signature

THIS MAP INDICATES WORK PERFORMED ON

1-30-08

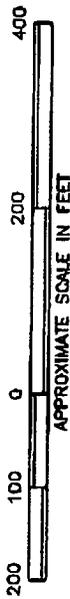


**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN	AEH	DATE	11-01-07
CHECKED	JAG	CAD	EOLF58-FSC112
APPROVED:		JOB NO:	J07-1001-58

**BLE** INC.  
**BUNNELL-LANFORD ENGINEERING, INC.**  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA, 29615  
 PHONE: (864)286-1295 FAX: (864)286-1430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 1-31-08

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: .5

WORK HOURS: 11.5

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

PROJECT DAY NO. 88

VISITORS:  
 NAME REPRESENTING

WEATHER: SUNNY CLOUDY PM WINDY  
 AM FOU CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 32 °F  
 DAYTIME HIGH: 53 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL.  
MAINTAINING THE MOISTURE CONTENT OF THE IN PLACE CLAY LINER.  
ROOT PICKERS ARE ON SITE.  
PLACEMENT OF THE FIRST LIFT OF CLAY LINER MATERIAL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL. PERFORMED NUCLEAR DENSITY TESTS, TEN FIELD GRAIN SIZES AND COLLECTED FIVE PERMEABILITY SAMPLES. PERFORMED DRIVE CYLINDER CALIBRATION TEST  
MONITORED PLACEMENT OF THE FIRST LIFT OF CLAY LINER MATERIAL.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

1-31-08

TOE OF SLOPE

TOP OF SLOPE

TOE OF SLOPE  
PLACEMENT OF  
COMPACTION OF THE  
THIRD LIFT OF CLAY LINER

PLACEMENT OF  
THE FIRST LIFT  
OF CLAY LINER  
MATERIAL

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES

**LEGEND**

26, B  
GRID REFERENCE NUMBER  
OR LETTER FOR TESTING

26  
GRID AREA ≤ 10,000 SF  
(100' x 100')



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES,  
HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBLE** inc.  
DUNNELL-JANSONS ENGINEERING, INC.  
804 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-1-08

PROJECT DAY NO. 89

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 11:30 PM

LUNCH BREAK: -

WORK HOURS: 4.5

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 55 °F  
DAYTIME HIGH: 67 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 0.15". THUNDERSTORMS ARE FORECAST FOR TODAY.

THERE WAS NO CONSTRUCTION ACTIVITY TODAY.

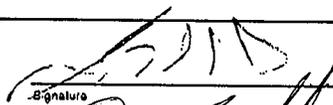
RECEIVED FOUR SUMPS (PERFORATED 24" H.D.P.E. PIPE WITH 4'X9'X2" FLAT STOCK BASESES, ONE DUAL CONTAINED CHECK VALVE WITH REDUCING TEE FOR USE AT 12 B AND FOUR BOXES OF FABRICATED PIECES (SEE ATTACHED PACKING LIST).

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED UNLOADING OF HDPE MATERIAL.

RECORD PREPARED BY:

  
Signature TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature DANIEL B. BUNNELL, P.E.



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-S6

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-2-08

PROJECT DAY NO. 90

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: 1.5

WORK HOURS: 11.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
~~PARTLY CLOUDY~~ RAIN

TEMPERATURE:  
MORNING LOW: 36 °F  
DAYTIME HIGH: 61 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

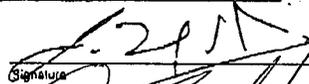
YESTERDAYS RAIN FALL WAS MEASURED AT 0.4". THERE ARE SMALL  
PUDDLING OF STANDING WATER IN THE EASTERN HALF OF THE CELL FLOOR.  
BLADING HAUL ROADS.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
ROOT PICKERS ARE ON SITE WORKING.  
COMPACTION OF THE FIRST LIFT OF CLAY LINER MATERIAL.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.  
MONITORED COMPACTION OF THE FIRST LIFT OF CLAY LINER MATERIAL.  
PERFORMED NUCLEAR DENSITY TESTS, THREE FIELD GRAIN SIZES  
AND COLLECTED TWO PERMEABILITY SAMPLES. PERFORMED  
DRIVE CYLINDER CALIBRATION TEST

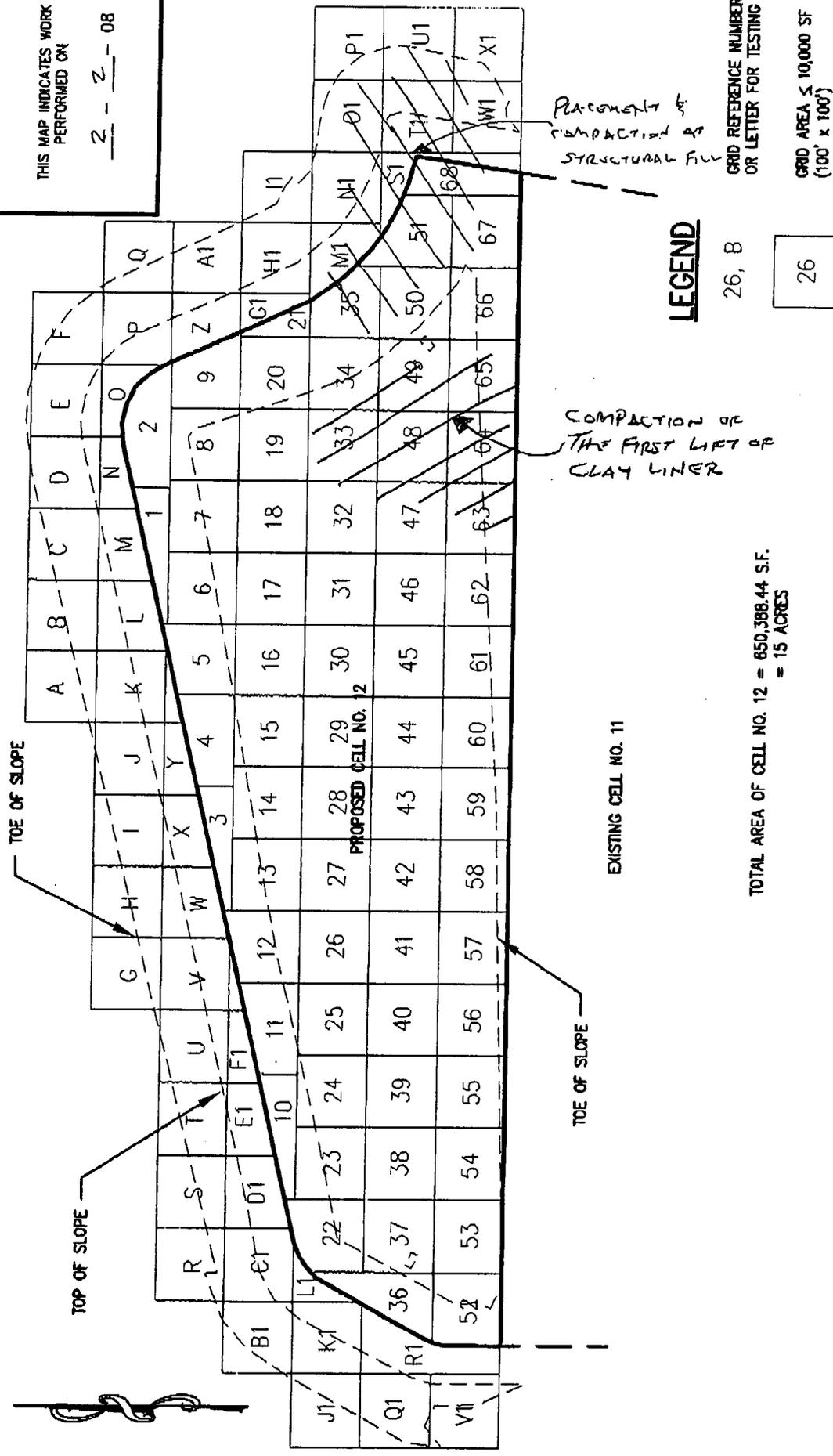
RECORD PREPARED BY:

 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
 Z - Z - 08



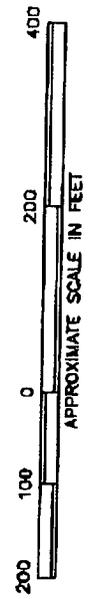
**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26  
 GRID AREA ≤ 10,000 SF (100' x 100')

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,398.44 S.F.  
 = 15 ACRES

REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, NC. DATED 9-27-07.



DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
 BUNNELL-LAWSONS ENGINEERING, INC.  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE (864)288-1265 FAX (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.  
 DATE: 2-3-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 11.5  
 ONSITE BLE PERSONNEL: TED STILES

PROJECT DAY NO. 91

VISITORS:  
 NAME REPRESENTING

WEATHER:  SUNNY     CLOUDY     WINDY  
            PTLY CLOUDY     RAIN

TEMPERATURE:  
 MORNING LOW: 41 °F  
 DAYTIME HIGH: 67 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

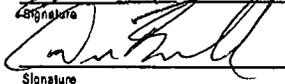
**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PLACEMENT AND COMPACTION OF THE FOURTH LIFT OF CLAY  
LINER MATERIAL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.  
MONITORED PLACEMENT AND COMPACTION OF CLAY LINER MATERIAL.  
PERFORMED NUCLEAR DENSITY TESTS, TWO FIELD GRAIN SIZES AND  
COLLECTED ONE PERMEABILITY SAMPLE. PERFORMED DRIVE CYLINDER  
CALIBRATION TEST.

RECORD PREPARED BY:  TED STILES  
 RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

2 - 3 - 08

TOE OF SLOPE

TOP OF SLOPE

PROPOSED CELL NO. 12

EXISTING CELL NO. 11

TOE OF SLOPE

PLACEMENT & COMPACTION OF THE 4<sup>TH</sup> LIFT OF CLAY LINER

PLACEMENT & COMPACTION OF STRUCTURAL FILL

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH

DATE: 11-01-07

CHECKED: JAG

CAD: ECLF58-FSCCELL12

APPROVED:

JOB NO: J07-1001-58

**IBL**  
BURNELL-JAMMONS ENGINEERING, INC.

6104 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)228-1215 FAX: (864)228-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-4-08

PROJECT DAY NO. 92

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: .5

WORK HOURS: 11-5

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: AM SUNNY CLOUDY WINDY  
PM PITY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 43 °F  
 DAYTIME HIGH: 68 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
COMPACTING THE FOURTH LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE.  
PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY LINER MATERIAL.  
CONTRACTOR/COMMITTEE: RESUME STOCKPILING WASHED PROTECTIVE COVER TOMORROW.  
STATE GPD MEETING IS SCHEDULED FOR THIS WEEK.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND/OR DENSITY TEST WORKSHEET

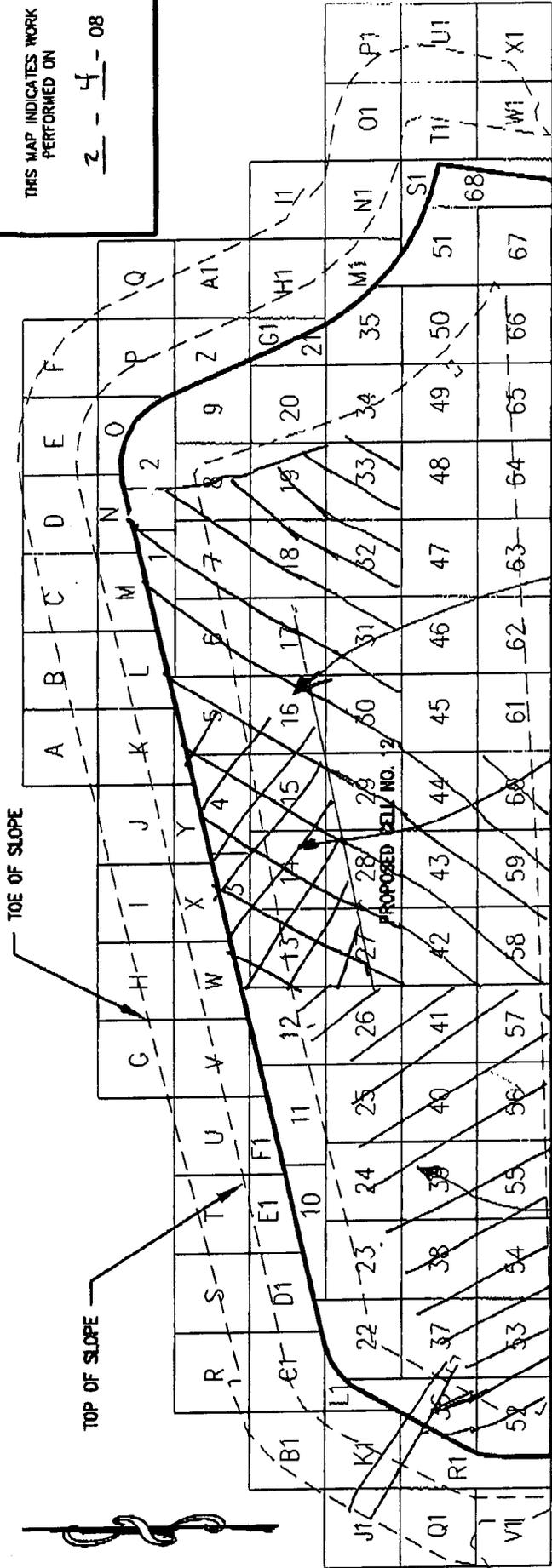
**TECHNICIAN ACTIVITIES:**

MONITORED COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL.  
PERFORMED FIFTEEN NUCLEAR DENSITY TESTS, EIGHT FIELD GRAIN SIZES  
AND COLLECTED FOUR PERMEABILITY SAMPLES.  
MONITORED PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY  
LINER MATERIAL. PERFORMED SIX NUCLEAR DENSITY TESTS, THREE FIELD  
GRAIN SIZES AND COLLECTED ONE PERMEABILITY SAMPLE.  
PERFORMED ONE DRIVE CYLINDER CALIBRATION TEST.

RECORD PREPARED BY: TED STILES  
 Signature: [Signature]  
 RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
 Signature: [Signature]

THIS MAP INDICATES WORK PERFORMED ON

2 - 4 - 08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

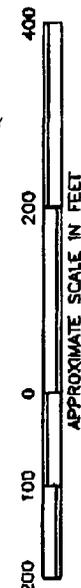
26 GRID AREA  $\leq 10,000$  SF (100' x 100')

PLACEMENT OF THE SECOND LIFT OF CLAY LINER

COMPACTION OF THE SECOND LIFT OF CLAY LINER

TOE OF SLOPE COMPACTION OF THE 4TH LIFT OF CLAY LINER

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIGURE: 1
CHECKED: JAG	CAD: ECLF8-FSC12	
APPROVED:	JOB NO: J07-1001-58	
<p><b>IBL</b> INC.  <b>BUNNELL-LANSON ENGINEERS, INC.</b>          6004 POWERS COURT          GREENVILLE, SOUTH CAROLINA 29615          PHONE: (864)288-1285 FAX: (864)288-4430</p>		
<p>FIELD SKETCH - CELL NO. 12          EAST CAROLINA LANDFILL          BERTIE COUNTY, NORTH CAROLINA</p>		

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-5-08  
 ARRIVAL TIME: 6:30 AM  
 DEPARTURE TIME: 6:30 PM  
 LUNCH BREAK: 2.0  
 WORK HOURS: 10.0

PROJECT DAY NO. 93

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
 PTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 54 °F  
 DAYTIME HIGH: 77 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVING WASHED PROTECTIVE COVER MATERIAL. THIS MATERIAL  
IS BEING STOCKPILED NORTH OF CELL 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY LINER.  
PERFORMED THIRTEEN NUCLEAR DENSITY TESTS, SIX FIELD GRAIN SIZES AND  
COLLECTED FOUR PERMEABILITY SAMPLES.  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
TWO DRIVE CYLINDER DENSITY TESTS.

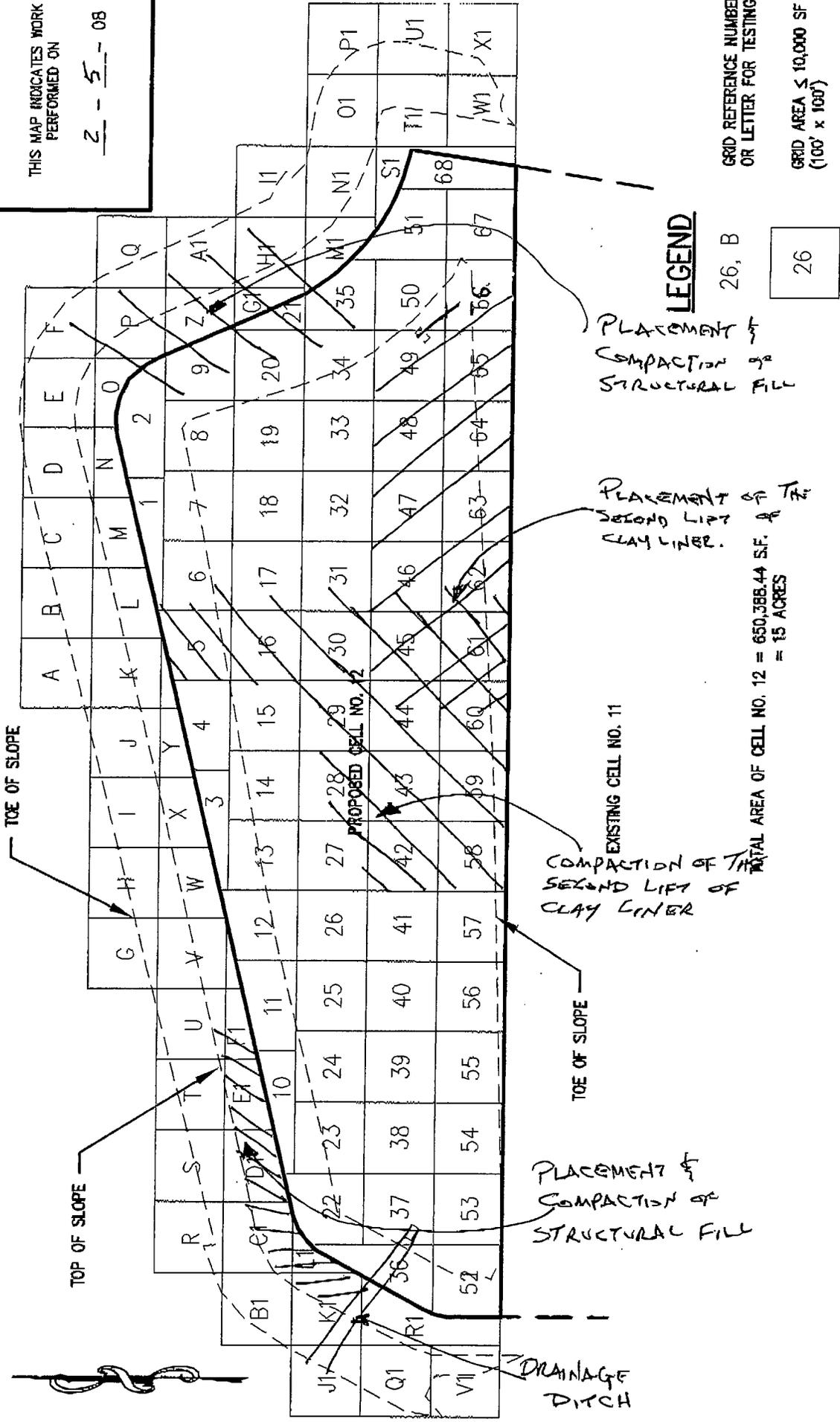
RECORD PREPARED BY:

Ted Stiles  
 Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
 Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
2-5-08



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

**IBL** INC.  
 BURNELL-LAMARSON ENGINEERING, INC.  
 5004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)788-1286 FAX: (864)788-4450

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

FIGURE  
**1**

WEEKLY MEETING ON THURSDAYS.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-6-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 6:00 PM  
LUNCH BREAK: 1.5  
WORK HOURS: 6.0

PROJECT DAY NO. 94

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

VISITORS:  
NAME REPRESENTING  
STEVEN NICHING R.B. BAKER  
\_\_\_\_\_

WEATHER: AM SUNNY PM CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 58 °F  
DAYTIME HIGH: 80 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DRAINAGE ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
COMPACTION OF THE SECOND LIFT OF CLAY LINER MATERIAL.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVING WASHED PROTECTIVE COVER MATERIAL. THIS MATERIAL IS BEING STOCKPILED NORTH OF CELL 12.  
ROOT PICKERS ARE ON SITE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED COMPACTION OF THE SECOND LIFT OF CLAY LINER.  
PERFORMED TWENTY-ONE NUCLEAR DENSITY TESTS, ELEVEN FIELD GRAIN SIZES AND COLLECTED FIVE PERMEABILITY SAMPLES. PERFORMED ONE DRIVE CYLINDER CALIBRATION TEST (CDD 137).  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED SIX DRIVE CYLINDER DENSITY TESTS.

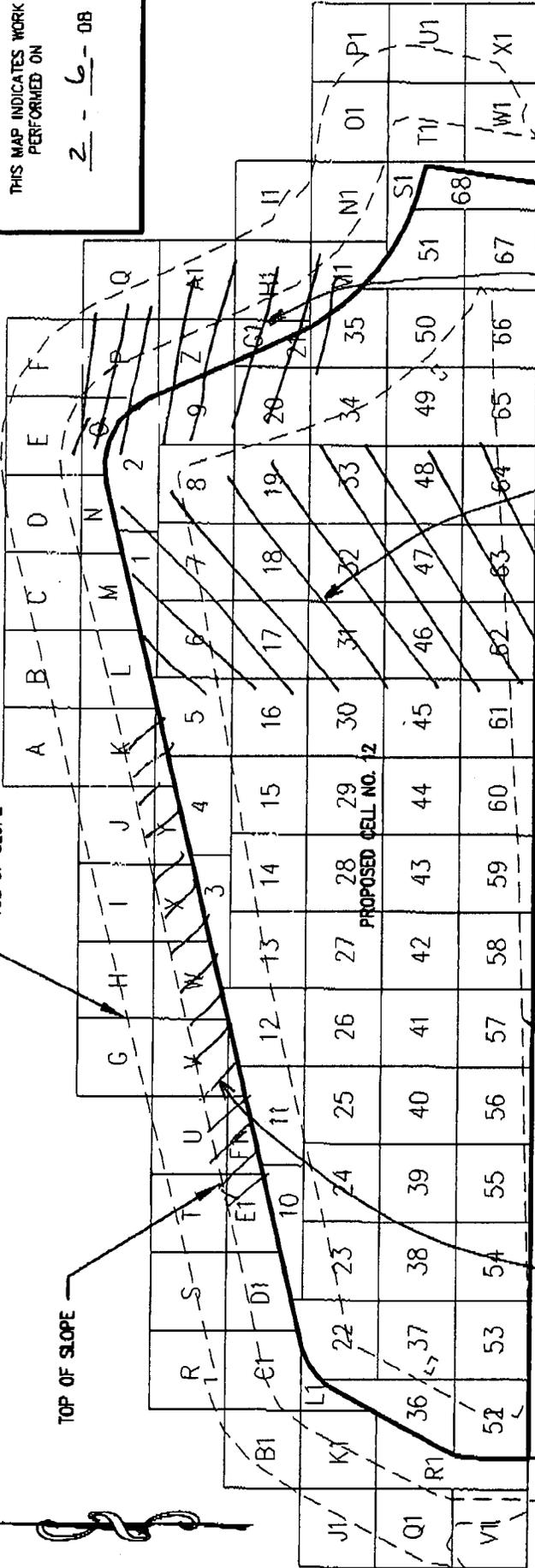
RECORD PREPARED BY: TED STILES  
Signature

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON  
2 - 6 - 08

TOE OF SLOPE

TOP OF SLOPE



PLACEMENT AND COMPACTION OF STRUCTURAL FILL

COMPACTION OF THE SECOND LIFT OF CLAY LINER.

PLACEMENT OF COMPACTION OF STRUCTURAL FILL

**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26 GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: EQLF58-FSCCELL12 JOB NO: J07-1001-58		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <h1>1</h1>
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WEEKLY MEETING ON THURSDAYS.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-7-8  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 6:00 PM  
LUNCH BREAK: 1.5  
WORK HOURS: 10.0

PROJECT DAY NO. 95

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 57 °F  
DAYTIME HIGH: 63 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BARRON AREA.  
PLACEMENT AND COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL.  
PLACEMENT OF STRUCTURAL FILL IN THE EAST BERM. THE MATERIAL  
HAS NOT BEEN FULLY BLADED INTO A LIFT.  
ROOT PICKERS ARE ON SITE.  
MAINTAINING SURFACE OF IN PLACE FOURTH LIFT OF CLAY  
LINER AT WEST END.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF THE THIRD LIFT OF CLAY  
LINER MATERIAL. PERFORMED FOURTEEN NUCLEAR DENSITY TESTS,  
SEVEN FIELD GRAV SIZES AND COLLECTED THREE PERMEABILITY SAMPLES.  
PERFORMED ONE DRIVE CYLINDER DENSITY TEST (CLO 158)  
THERE IS APPROXIMATELY 5500 TONS OF WASHED PROTECTIVE COVER  
MATERIAL STOCKPILED ON SITE.

RECORD PREPARED BY: [Signature] TED STILES

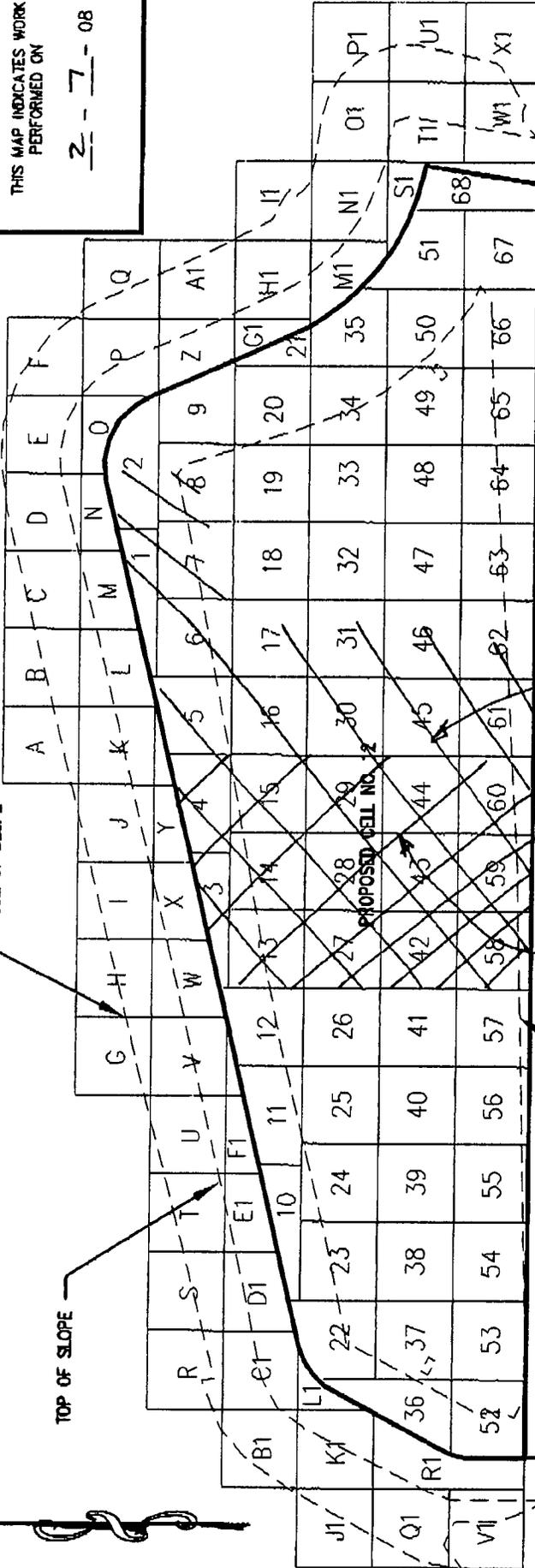
RECORD REVIEWED & APPROVED BY: [Signature] DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

Z-7-08

TOE OF SLOPE

TOP OF SLOPE



PLACEMENT OF THE THIRD LIFT OF CLAY LINER

COMPLETION OF THE THIRD LIFT OF CLAY LINER

TOE OF SLOPE

**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE	11-01-07
CAD	ECLFSB-FSCCELL12
JOB NO.	J07-1001-58

**IBL**  
 ENGINEERING, INC.  
 6004 FORBES COURT  
 CLEVELAND, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-8-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 5:00 PM  
LUNCH BREAK: 1.0  
WORK HOURS: 9.5

PROJECT DAY NO. 96

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PARTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 39 °F  
DAYTIME HIGH: 63 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DRAINAGE ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE.  
MAINTAINING THE MOISTURE CONTENT OF THE IN PLACE MATERIAL.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

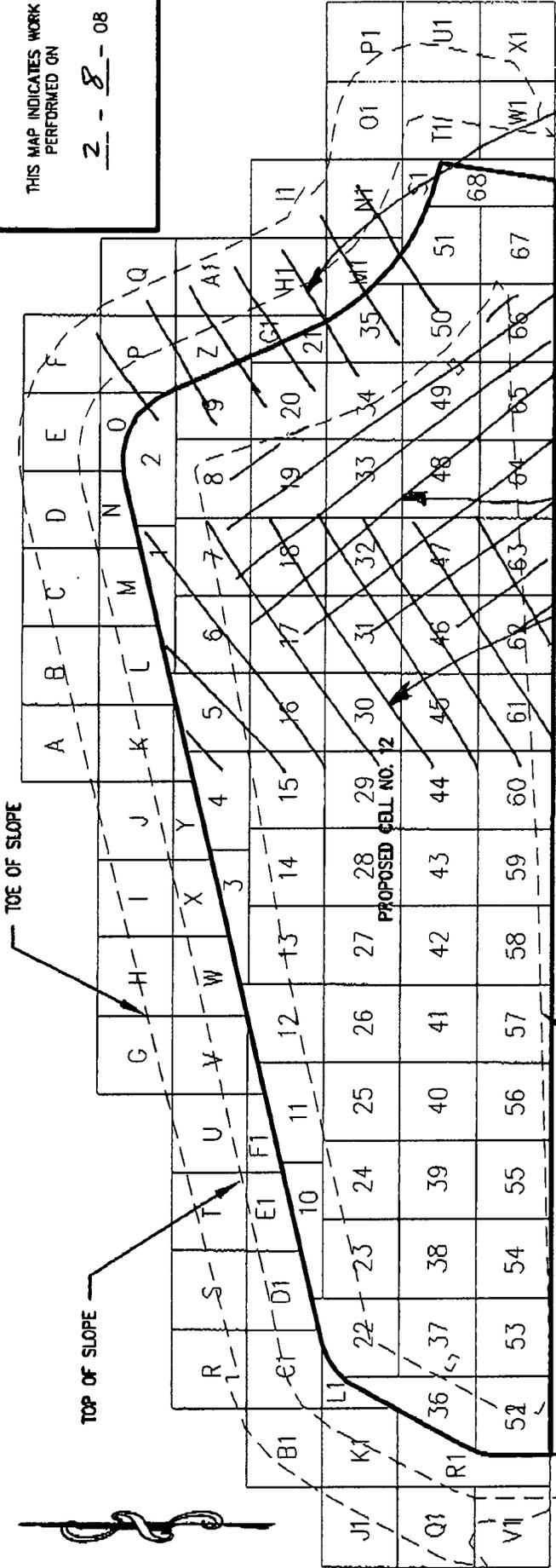
MONITORED PLACEMENT AND COMPACTION OF THE THIRD LIFT OF CLAY  
LINER MATERIAL. PERFORMED NUCLEAR DENSITY TESTS, NINE FIELD  
GRAIN SIZES AND COLLECTED FOUR PERMEABILITY SAMPLES. PERFORMED  
DRIVE CYLINDER CALIBRATION TEST.  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY: [Signature] TED STILES

RECORD REVIEWED & APPROVED BY: [Signature] DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

2 - 8 - 08



PLACEMENT OF COMPACTED STRUCTURAL FILL

PLACEMENT OF THE THIRD LIFT OF CLAY LINER

COMPACTED OF THE THIRD LIFT OF CLAY LINER

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: ACH	DATE: 11-01-07	<b>IBL</b> BURRELL-LAMMONS ENGINEERING, INC. 8004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)288-1265 FAX: (864)288-4430	FIGURE
CHECKED: JAG	CAD: ECLF58-FSC112		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-9-08

PROJECT DAY NO. 97

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:00 PM

LUNCH BREAK: 1.5

WORK HOURS: 8.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 45 °F  
DAYTIME HIGH: 69 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL



COMPACTED CLAY LINER  
LEACHATE COLLECTION



CONTRACTOR ACTIVITIES:

COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
ROOT PICKERS ARE ON SITE.  
PLACEMENT OF THE FOURTH LIFT OF CLAY LINER MATERIAL. THE  
DISC HARROWS ARE NOT OPERATING. THE FOURTH LIFT HAS NOT BEEN  
PROCESSED OR COMPACTED. MAINTENANCE TO BE PERFORMED PRIOR TO RESUMING WORK.  
EXCAVATING AND PILING (IN PLACE) THE Wetter PROTECTIVE COVER  
MATERIAL IN THE BORROW AREA TO ASSIST IN DRYING THE MATERIAL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL  
PERFORMED NUCLEAR DENSITY TESTS, FOUR #60 GRAIN SIZES AND COLLECTED  
TWO PERMEABILITY SAMPLES. PERFORMED DRIVER CYLINDER CALIBRATION  
TEST.  
MONITORED PLACEMENT OF THE FOURTH LIFT OF CLAY LINER MATERIAL.

RECORD PREPARED BY:

Signature

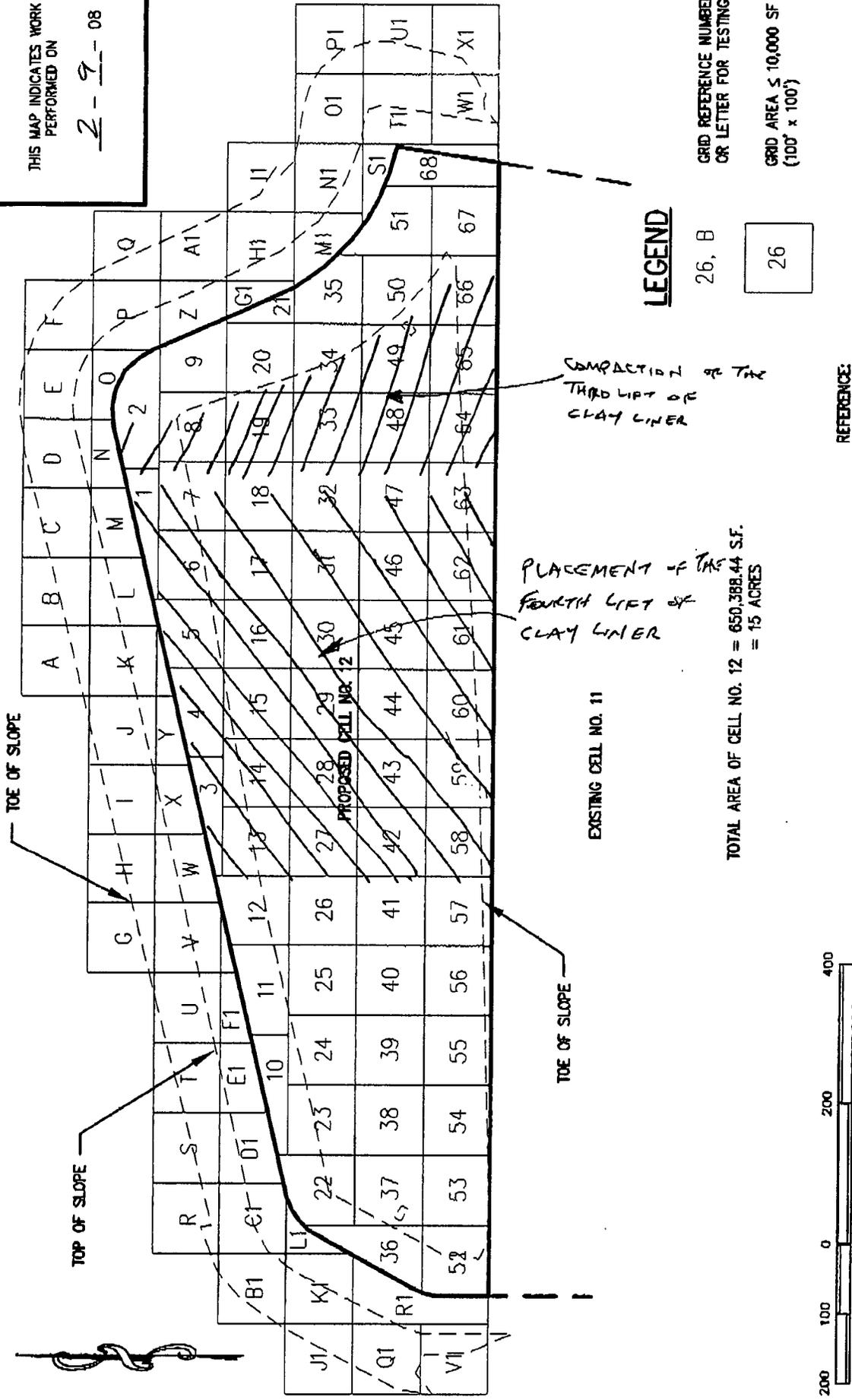
TED STILES

RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
2-9-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING  
26, B  
GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )  
26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH		DATE: 11-01-07	<p><b>IBL</b> BUNNELL-JAMMONS ENGINEERING, INC. 6004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)286-1285 FAX: (864)286-4430</p>	FIGURE	
CHECKED: JAG		CAD: EGLF58-FSCCELL12		<p>FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA</p>	1
APPROVED:		JOB NO: J07-1001-58			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-12-08

PROJECT DAY NO. 98

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 4:00 PM

LUNCH BREAK: 1.0

WORK HOURS: 7.5

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 44 °F  
DAYTIME HIGH: 54 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF THE FOURTH LIFT OF THE CLAY LINER. THE DISC HARROWS ARE NOT OPERATING (MAINTENANCE REQUIRED PRIOR TO PROCESSING)  
ROOT PICKERS ARE ON SITE.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
MAINTAINING THE MOISTURE CONTENT OF THE IN PLACE CLAY LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF THE FOURTH LIFT OF THE CLAY LINER.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RECORD PREPARED BY:

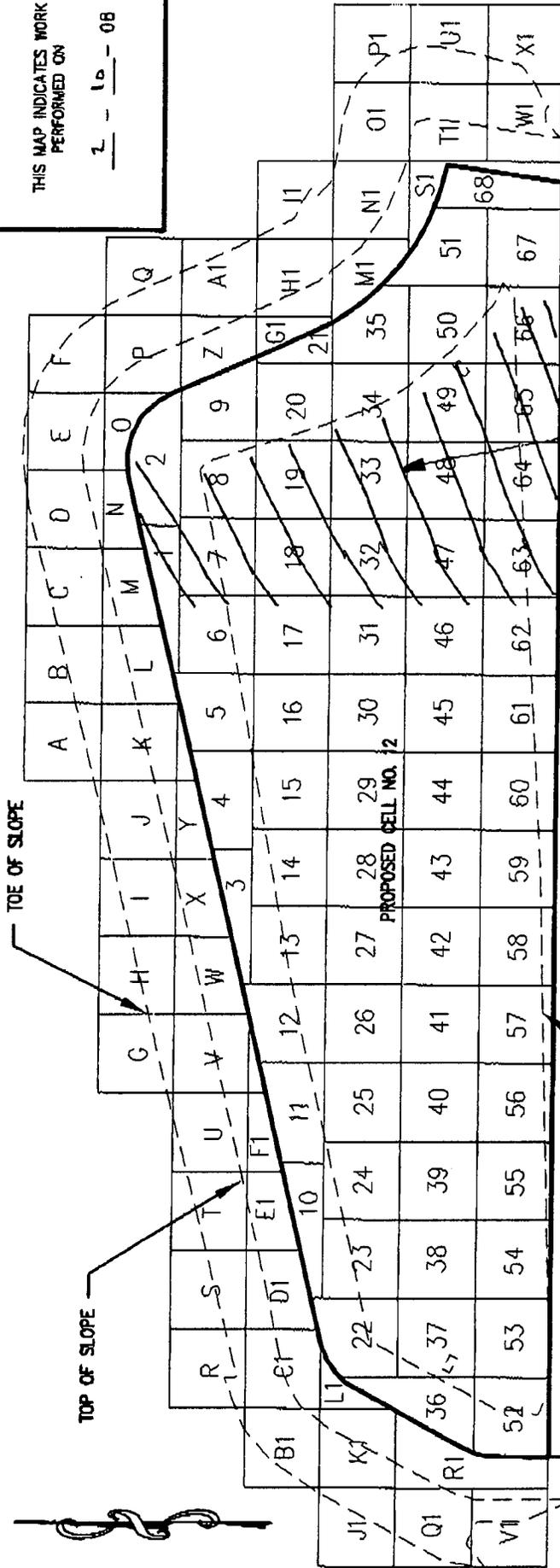
Ted Stiles Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel Bunnell Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

2 - 10 - 08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

26

PLACEMENT OF THE FOURTH LIFT OF CLAY LINER

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**TRIBBLE, INC.**  
 RUSSELL-LANFORDS ENGINEERING, INC.  
 6004 PONDGES COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-11-08  
ARRIVAL TIME: 7:30 AM  
DEPARTURE TIME: 5:50 PM  
LUNCH BREAK: 1.5  
WORK HOURS: 8.0

PROJECT DAY NO. 99

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 25 °F  
DAYTIME HIGH: 45 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
MAINTAINING THE MOISTURE CONTENT ON THE IN PLACE CLAY LINER.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

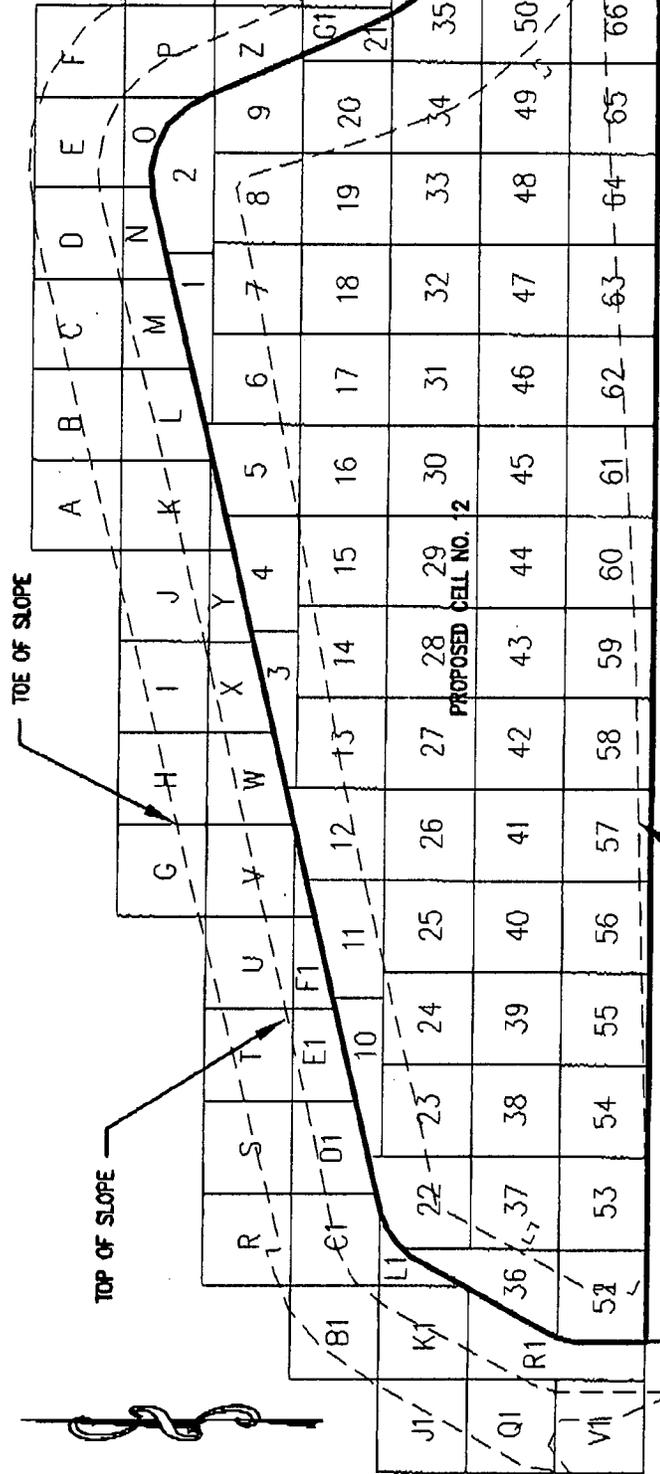
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RECORD PREPARED BY: TED STILES  
Signature

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON

2 - 11 - 08



PLACEMENT & COMPACTION OF STRUCTURAL FILL

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,386.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL** INC.  
**BUNNELL-LANSON ENGINEERING, INC.**  
 6004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE (864)288-1285 FAX (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HOOGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-12-08

PROJECT DAY NO. 150

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 5:00 PM

LUNCH BREAK: 1.5

WORK HOURS: 80

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 36 °F  
DAYTIME HIGH: 60 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
MAINTAINING MOISTURE CONTENT OF THE INPLACE CLAY LINER.  
ROOT PICKERS ARE WORKING THE SURFACE OF THE UNCOMPACTED FOURTH LIFT  
OF CLAY LINER.  
DISC HARROW HAS BEEN REPAIRED

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

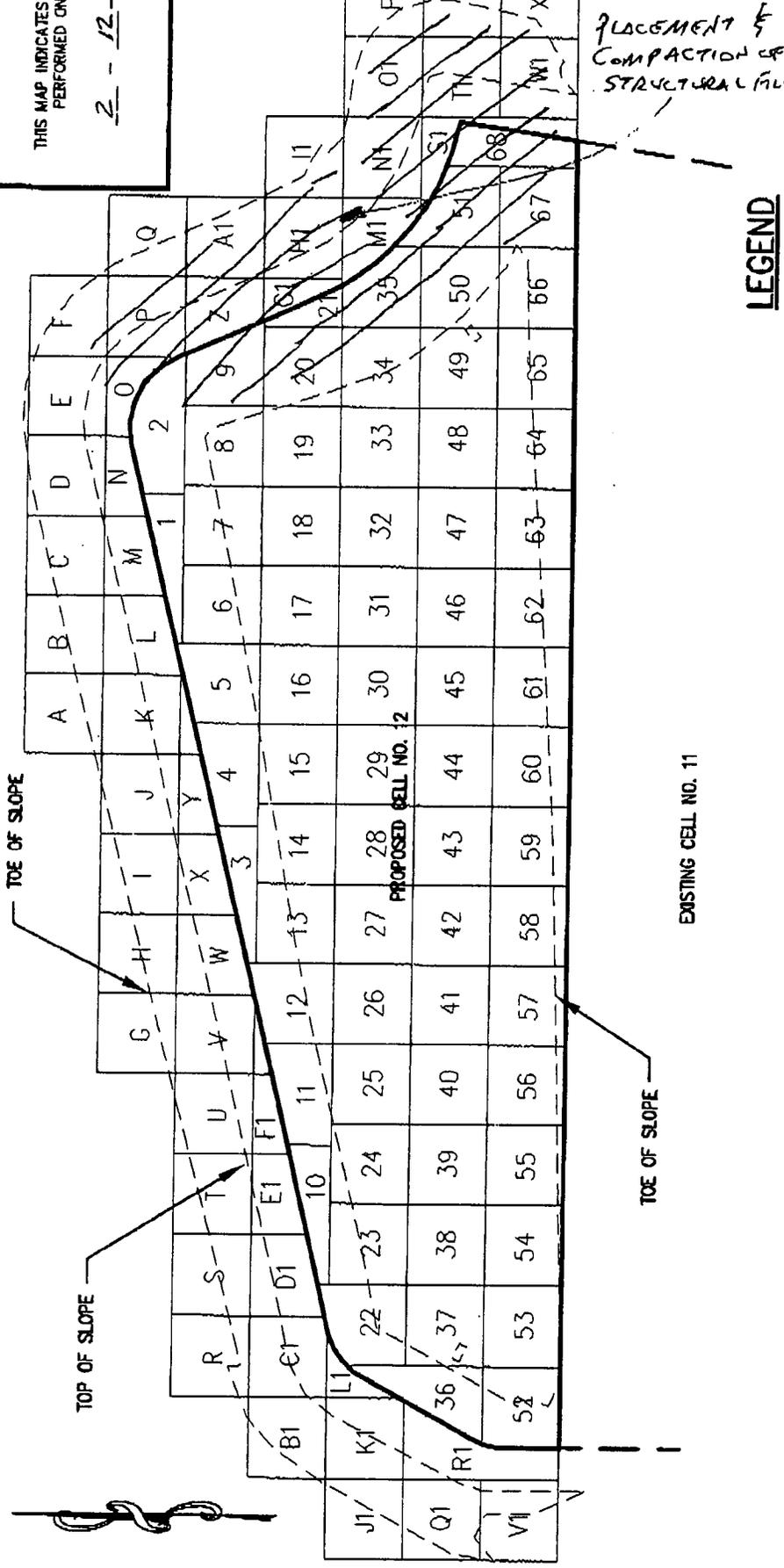
TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY: TED STILES  
Signature

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON  
2 - 12 - 08

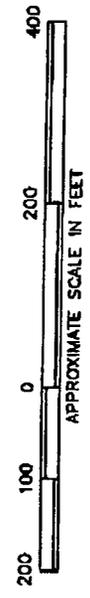


**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 GRID AREA  $\leq 10,000$  SF  
 (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
 = 15 ACRES



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TREBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBLE** INC.  
 BURNELL-LAMBSON ENGINEERING, INC.  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

PROJECT MEETING ON SITE TUESDAY 2-19-08

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-13-08

PROJECT DAY NO. 101

ARRIVAL TIME: / AM

DEPARTURE TIME: / PM

LUNCH BREAK: /

WORK HOURS: /

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 54 'F  
DAYTIME HIGH: 63 'F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

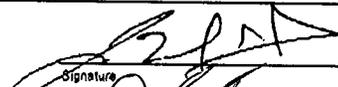
OVERNIGHT RAIN FALL WAS MEASURED AT 0.8". ADDITIONAL RAIN FALL IS FORECAST FOR TODAY.  
THERE WAS NO CONSTRUCTION ACTIVITY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

CONFIRMED SITE CONDITIONS VIA PHONE CALL WITH TIMMY LEE (R.B. BAKER SITE SUPERINTENDANT).

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-14-08

PROJECT DAY NO. 102

ARRIVAL TIME: 8:00 AM

DEPARTURE TIME: 5:00 PM

LUNCH BREAK: 1.00

WORK HOURS: 8:00

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PARTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 34 °F  
DAYTIME HIGH: 53 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

1.3" OF RAIN FALL MEASURED YESTERDAY. A 30 HOUR TOTAL RAINFALL OF 2.1".  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL IN THE EAST BERM.  
BLADING AREAS IN THE CELL, TO DISPERSE STANDING WATER, ON THE FOURTH LIFT OF AN COMPACTED CLAY LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:



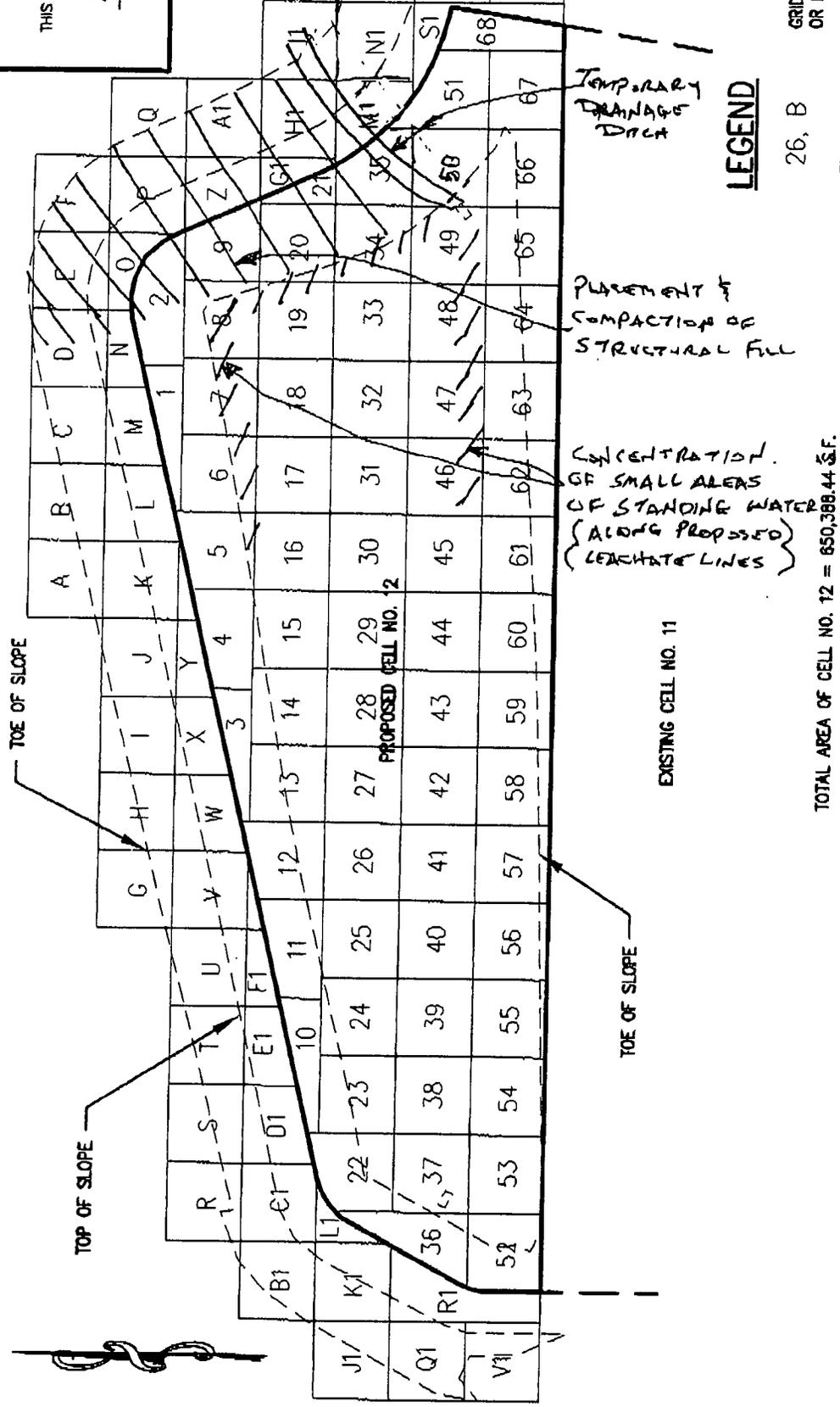
TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON 2-14-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING 26, B

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: ECLF58-FSCCELL12 JOB NO: J07-1001-58	<p><b>BUNNELL-LAMMONS ENGINEERING, INC.</b>          804 PONDERS COURT          GREENVILLE, SOUTH CAROLINA 29615          PHONE: (864)288-1265 FAX: (864)288-4400</p>	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <h1>1</h1>
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RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-15-08

PROJECT DAY NO. 103

ARRIVAL TIME: 8:20 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: -

WORK HOURS: 9.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

STEVE RICHTING of R. B. BAKER

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 41 °F  
DAYTIME HIGH: 63 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

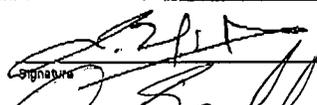
CONTRACTOR ACTIVITIES:

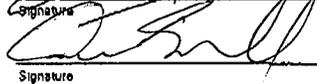
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
DISCING THE FOURTH LIFT OF CLAY LINER MATERIAL. RECENT RAIN FALL  
HAS PROVIDED SUFFICIENT MOISTURE.  
COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL.  
ROOT PULLERS ARE ON SITE WORKING.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

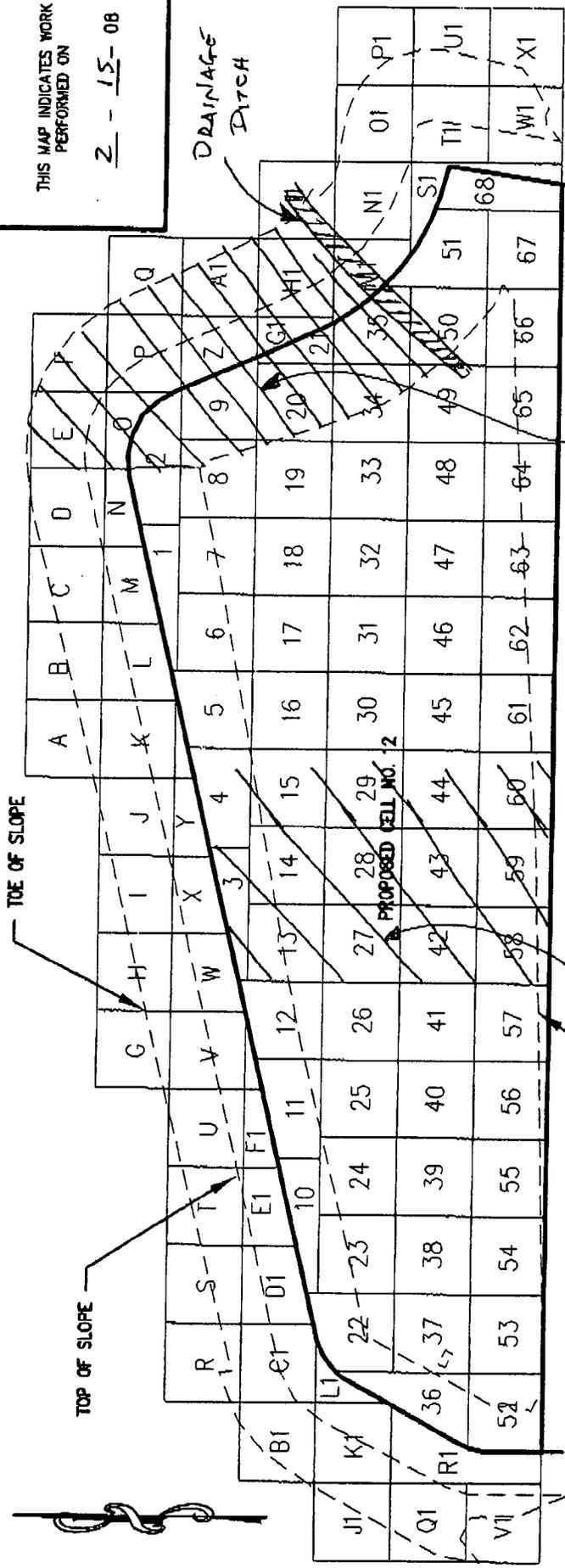
TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED NUCLEAR DENSITY TESTS.  
MONITORED COMPACTION OF THE FOURTH LIFT OF CLAY LINER.  
PERFORMED NUCLEAR DENSITY TESTS, FIELD GRAIN SIZES AND COLLECTED  
PERMEABILITY SAMPLES. PERFORMED A DRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
Z - 15-08



PLACEMENT & COMPACTION OF STRUCTURAL FILL

COMPACTION OF THE FOURTH LIFT OF CLAY LINER

EXISTING CELL NO. 11

**LEGEND**

26, B

26

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
BUNNELL-LANSONG ENGINEERING, INC.  
6004 FOWERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)286-1286 FAX: (864)286-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-16-08

PROJECT DAY NO. 104

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: 1.5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY PM, CLOUDY AM, RAIN, WINDY

TEMPERATURE: MORNING LOW: 44 °F, DAYTIME HIGH: 59 °F

EQUIPMENT: SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
DISING AND COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE WORKING.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED NUCLEAR DENSITY TESTS.  
MONITORED COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL. PERFORMED NUCLEAR DENSITY TESTS, FIELD GRAIN SIZES AND COLLECTED PERMEABILITY SAMPLES. PERFORMED A DRIVE CYLINDER CALIBRATION.

RECORD PREPARED BY: [Signature] TED STILES

RECORD REVIEWED & APPROVED BY: [Signature] DANIEL B. BUNNELL, P.E.



EQUIPMENT OF PROJECT

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMBSONS ENGINEERING, INC. PROJECT NO. 07-1001-58

Page 1 of 1

EQUIPMENT	DATE / DAY							COMMENTS
	2-10-08 Sunday	2-11-08 Monday	2-12-08 Tuesday	2-13-08 Wednesday	2-14-08 Thursday	2-15-08 Friday	2-16-08 Saturday	
CAT. D6N LGP DOZIE R HYDRAULIC W/1300 DEF ROAD	2	2	2	2	2	2	2	
CAT. 815 F COMPACTOR	7	7	7	7	7	7	7	
WHEEL TRACTOR CHALLENGER W/DISCS	1	1	1	1	1	1	1	
VALU EX 300 B EXCAVATOR	1	1	1	1	1	1	1	
CAT 330 EXCAVATOR	1	1	1	1	1	1	1	
5000 GALLON WATER TANKER	1	1	1	1	1	1	1	
2000 GALLON WATER TRUCK	1	1	1	1	1	1	1	FOR USE ON FINISHED CLAY LINER SURFACE
INGERSOLL RAND DRUM RAMD SPILL COMPACTOR	1	1	1	1	1	1	1	

NUMBER REFERS TO QUANTITY OF EQUIPMENT PRESENT ON SITE ON DATE INDICATED

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-17-08

PROJECT DAY NO. 105

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 34 °F  
DAYTIME HIGH: 68 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
DISCING AND COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE WORKING.  
CONTRACTOR/COA MEETING: TENTATIVE DATE FOR ASBUILT OF SUBGRADE  
ON THE EAST BERM IS WEDNESDAY 2-20-08.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND/OR DENSITY TEST WORKSHEET

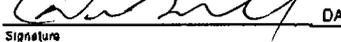
TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED NUCLEAR DENSITY TESTS.  
MONITORED COMPACTION OF THE FOURTH LIFT OF CLAY LINER. PERFORMED  
NUCLEAR DENSITY TESTING, FIELD GRAIN SIZES AND COLLECTED  
PERMEABILITY SAMPLES. PERFORMED A DRYE CYLINDER CALIBRATION TEST.

RECORD PREPARED BY:

 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON

2 - 17 - 08

TOE OF SLOPE

TOP OF SLOPE

DRAINAGE DITCH

PLACEMENT OF COMPACTION OF STRUCTURAL FILL

CURBOUT = EDGE OF COMPACTED CLAY LINER

COMPACTION OF THE FOURTH LIFT OF CLAY LINER

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	<p><b>IBL</b> <small>INC.</small></p> <p><b>BURRELL-LANSON ENGINEERING, INC.</b></p> <p>804 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)728-1225 FAX: (864)728-1430</p>	FIGURE
CHECKED: JAG	CAID: ECLF58-FSC0112		<p>FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA</p>
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-88

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-18-07

PROJECT DAY NO. 106

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 11:30 PM

LUNCH BREAK: -

WORK HOURS: 9.0

VISITORS:  
NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PARTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 61 °F  
DAYTIME HIGH: 69 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 2.7". ADDITIONAL RAIN IS  
FORECAST TODAY.  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
THERE WAS NO CONSTRUCTION ACTIVITY TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.



**BUNNELL-LAMMONS ENGINEERING, INC.**  
 GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF SITE OBSERVATIONS & MEETING**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Date of Observations:** February 19, 2008

**Project Status:** Structural Fill East Berm, Compacted Clay Liner

**Weather Conditions:** Sunny, high mid-60's

**Meeting Attendees:**

<u>NAME</u>	<u>FIRM</u>	<u>PHONE</u>
Mr. Bill Cooksey	East Carolina Regional MSW Landfill	(252) 348-3322
Mr. Mitch Hoggard	East Carolina Regional MSW Landfill	(252) 348-3322
Mr. Ray Hoffman, P.E.	Republic Services of North Carolina, LLC	(828) 464-2414
Mr. Bill Hodges, P.E.	Hodges, Harbin, Newberry & Tribble, Inc.	(912) 743-7175
Mr. Steve Nichting	R.B. Baker Construction Company, Inc.	(912) 658-5570
Mr. Timmy Lee	R.B. Baker Construction Company, Inc.	(912) 964-6513
Mr. Dan Bunnell, P.E.	Bunnell-Lammons Engineering, Inc.	(864) 787-6085
Mr. Ted Stiles	Bunnell-Lammons Engineering, Inc.	(864) 201-5517

**Site Observations:**

The meeting attendees observed the Cell No. 12 construction area and the Tripp Borrow Area. R.B. Baker Construction Company, Inc. (Baker) was excavating silty sandy protective cover soils from the Tripp Borrow Area and placing the material as compacted structural fill on the east embankment of Cell No. 12. Excavation was being performed with a CAT 330 track excavator. The material was transported in Volvo 30 ton articulated dump trucks. The soils were spread with a dozer and compacted with multiple passes of a vibratory smooth drum roller.

The 4<sup>th</sup> lift of compacted clay liner soils had been placed over the cell floor but had not yet been processed and compacted. Temporary drainage ditches have been left in the structural fill in both the east and west embankments of Cell No. 12 to allow for storm water drainage by gravity flow.

It was noted that there was adequate clay and protective cover sand remaining in the Tripp Borrow Area for completion of the Cell No. 12 construction based on visual estimates.

Borrow Area No. 9 was observed. The landfill had been in the process of lowering the water level within the Borrow Area to allow additional excavation. The landfill is also clearing the eastern edge of the Borrow Area

to the permitted limit. It was noted that additional soils that would be suitable for compacted clay liner, structural fill, and possibly some protective cover sands were present within Borrow Area No. 9.

### Construction Progress Meeting:

Following observation of the Cell No. 12 construction area, Borrow Area No. 9 and the Tripp Property Borrow Area, a construction progress meeting was held in the conference room at the office of East Carolina Regional MSW Landfill. The following items were discussed.

Management of Tripp Borrow Soils: It was noted that there is sufficient clay liner borrow and native sand protective cover borrow soils to complete construction of Cell No. 12 within the currently permitted area of the Tripp Borrow Pit. The remaining materials consist of silty sandy clays suitable for use as clay liner, fine to medium slightly silty sand suitable for use as protective cover, and some silty sand sandy silt suitable for use as structural fill. As noted in the preconstruction and previous site meetings, the fine to medium sand, suitable for use as protective cover, is a valuable site resource and its use is restricted to protective cover. Consideration will be given to allowing Baker to obtain required structural fill materials from Borrow Pit No. 9 to allow retention of the protective cover sands in the Tripp Borrow Area not required for use in Cell No. 12.

Following discussion of the Borrow Pit management, Baker was directed to complete construction of the Cell No. 12 eastern berm only up to the required edge of liner utilizing materials available in the Tripp Borrow Area. Construction of the haul road and the remaining portion of the eastern berm outside of the liner edge will be performed using material not suitable for use as protective cover obtained either from the Tripp Borrow property or from Borrow Pit No. 9.

### Status of Project Materials:

1. Geomembrane: AEG has been selected as the geomembrane installer. The geomembrane has been delivered to the site. Steve Nichting, the Baker project manager, indicated that Baker plans to have the completed clay liner surface prepared so that geomembrane installation can begin on March 3 to March 5, 2008.
2. Cell Completion: Baker anticipates substantial completion of Cell No. 12 by April 18, 2008.
3. No. 57 and No. 78M Stone: No. 57 and No. 78M stone will be obtained by the landfill at a nearby quarry. Bill Cooksey will coordinate sampling of the material by Ted Stiles for conformance testing. The stockpiles of No. 57 and No. 78M stone are to be placed in the west end of the Cell No. 10 staging area. This will allow placement of the stones on the in-place crusher run.

4. Clay Installation: Baker reported that the 4<sup>th</sup> lift of clay liner has been placed but not yet processed over the cell floor. Clay remains to be placed on the eastern berm. There is sufficient clay liner borrow soil in the Tripp Borrow Area to complete Cell No. 12.
5. HDPE Pipe: HDPE pipe and structures are on-site.
6. Protective Cover Off-site Sand: Approximately ½ of the required volume has been delivered.
7. GCL: GCL delivery is expected next week.
8. Geotextiles:
  - 24 osy cushion fabric, (SKAPS GE-240): approved and on-site
  - 6 osy cushion fabric: (Propex 801, 8 osy). approved and on-site
  - 6 osy HDPE pipe sock: (SKAPS GE-160), approved, not yet ordered by Baker

Top of Structural Fill As-built: Baker will notify HHNT when the subgrade slopes and berms are completed and ready for as built survey by Tommy Fields. It is anticipated that the eastern portion of the cell will be completed for as-built survey by 2/27/08 or 2/28/08. The remaining portions of the berm will be completed at the time of as-built of the top of clay liner.

Project Cost Considerations: Several items were reviewed with Baker which would provide for potential project construction cost reductions. The following items will be removed from Baker's construction contract and performed by Republic/East Carolina Landfill.

- Ditch Lining
- Litter Fence
- Seeding
- Staging Area
- Road Fabric and Stone

Bill Hodges, P.E. indicated that he would provide a change order addressing each of these issues with Baker. Mr. Nichting indicated that the ditch lining material and litter fence had not yet been ordered.

Staging Area: Mr. Cooksey indicated that the staging area for access into Cell No. 12 will be constructed from waste at the southeast corner of Cell No. 12 where the landfill can ramp into the new cell from the northeast corner of Cell No. 11.

Rainflaps: Mr. Nichting made a suggestion of replacing the two eastern rainflaps as indicated on the project documents with one rainflap placed just below the eastern leachate line along the east slope toe. Mr. Hodges requested Mr. Nichting to provide a sketch of the suggested revised location. Bill Cooksey is to make a field

decision regarding the final locations of all rainflaps and the point at which the rainflaps will terminate on each of the side slopes.

Leachate Pipe Freeze Protection: Freeze protection is to be installed at the riser pipes as noted in the plans.

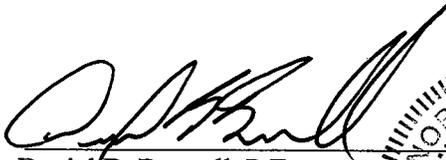
Marker Posts: Baker is to provide the 4"x4" marker posts, each painted white. The landfill will be responsible for lettering or placing signs on each post.

Safety: Mr. Cooksey directed that when any construction personnel get out of their vehicles they must have on proper safety equipment which include safety vests and proper work boots.

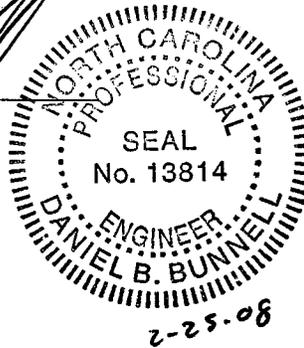
Fuel Spills: All fuel spills must be immediately cleaned-up. The material is to be excavated and placed within the active working face of the landfill.

Storm Water Protection from Cell No. 11: Mr. Cooksey noted that there had been a breach in the storm water control berm on the north end of Cell No. 11. Mr. Cooksey noted that this storm water control berm should be reinforced to prevent silt from washing in to the Cell No. 12 construction area.

Recorded by:



Daniel B. Bunnell, P.E.  
Project CQA Engineer  
Registered, NC No. 13814



Distribution: Meeting Attendees  
Matt Cheek, P.E.  
Jeff Helvey, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-19-08  
ARRIVAL TIME: 7:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: 1.5  
WORK HOURS: 9.5

PROJECT DAY NO. 107

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL:  
TED STILES  
DAN BUNNELL, PE

RAY HOFFMAN, PE REPUBLIC  
BILL HODGES, PE H.H.N. & T.  
STEVE NICHING R.B. BAKER.

WEATHER: BUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 43 °F  
DAYTIME HIGH: 59 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

YESTERDAY'S RAINFALL WAS MEASURED AT 0.1".  
DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PROJECT MEETING HELD ON SITE TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLINDER DENSITY TESTS.

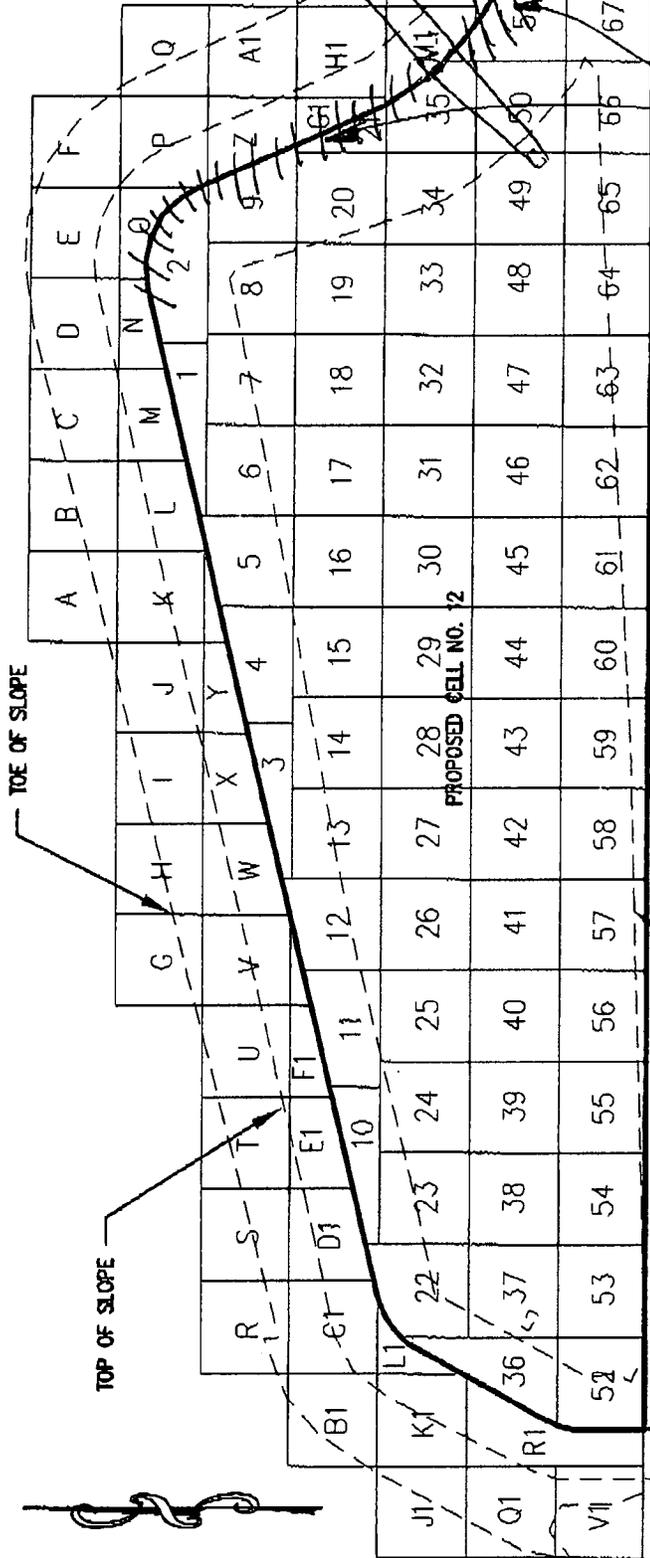
RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

2 - 19 - 08

DRAINAGE  
DITCH



PLACEMENT OF  
COMPACTION OF  
STRUCTURAL FILL

**LEGEND**

26, B

GRID REFERENCE NUMBER  
OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF  
(100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

EXISTING CELL NO. 11



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES  
HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
BUNNELL-LAMBORN ENGINEERING, INC.  
804 POWERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE (864)788-1285 FAX (864)288-4480

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**1**

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-20-08

PROJECT DAY NO. 108

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 9-5

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 36 °F  
 DAYTIME HIGH: 62 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

DAILY DEWATERING ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
FINE GRADING THE SUBGRADE ON THE EAST BERM.

CONTRACTOR/COA MEETING: (MATERIAL UPDATE) CLAY LINER MATERIAL IN THE TRIPP PROPERTY BORROW AREA SHOULD BE PRESERVED FOR USE IN THE CLAY LINER CONSTRUCTION IN CELL 12.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

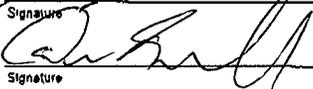
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED NUCLEAR DENSITY TESTS.  
PERFORMED NUCLEAR DENSITY TESTS AT SUBGRADE ON THE EAST BERM.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-21-08

PROJECT DAY NO. 109

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 3:30 PM

LUNCH BREAK: -

WORK HOURS: 8.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY AM CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 30 °F  
DAYTIME HIGH: 45 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL



COMPACTED CLAY LINER  
LEACHATE COLLECTION



CONTRACTOR ACTIVITIES:

BLADING LEVEL ALL AREAS IN THE TRIPP PROPERTY BORROW AREA, AND  
FILL AREAS.

INSTALLED A TEMPORARY 24" ADS RIBBED PIPE AT THE EXTERIOR  
OF THE EAST BERM DRAINAGE DITCH.

TOMMY FIELDS IS ON SITE. HE HAS COMPLETED THE SUBGRADE  
ASBUILT. ON THE EAST BERM, THERE ARE <sup>TWO</sup> GRID POINTS IN THE AREA  
OF THE EAST DRAINAGE DITCH WHICH COULD NOT BE SHOT.

EXCAVATION AND PILING SILTY SAND (STRUCTURAL FILL MATERIAL)  
IN THE EAST END OF THE TRIPP PROPERTY BORROW AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ACTIVITY ON SITE.

PRESENT DURING ASBUILT ON THE EAST BERM.

RECORD PREPARED BY:

TED STILES

RECORD REVIEWED & APPROVED BY:

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

2 - 21 - 08

MAIN SWCC

TOE OF SLOPE

TOP OF SLOPE

INSTALLATION OF TEMPORARY PIPE

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.



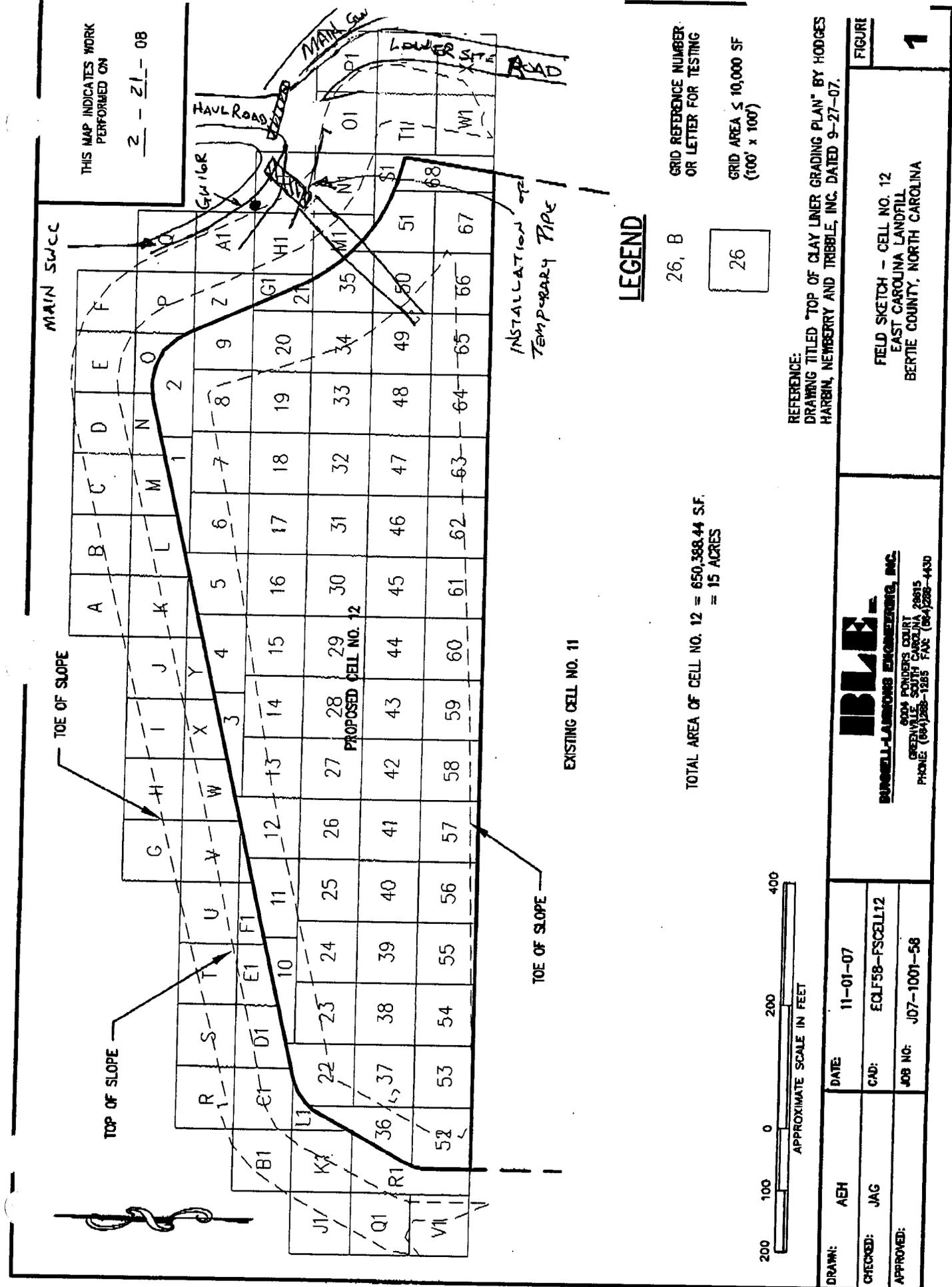
DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	EOLF58-FSC12
APPROVED:		JOB NO:	J07-1001-58

**IBL**  
BURSELL-LAWRENCE ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1255 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-25-08

PROJECT DAY NO. 113

ARRIVAL TIME: / AM

DEPARTURE TIME: / PM

LUNCH BREAK: /

WORK HOURS: /

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: / °F  
DAYTIME HIGH: / °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST  
\_\_\_\_\_

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

MINIMAL PERSONNEL ON SITE. BLADING HAUL ROADS AND  
FILL AREA.

EXCAVATION AND PILING PROTECTIVE COVER MATERIAL IN THE  
TRIPP PROPERTY BORROW AREA.

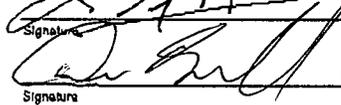
WEEKEND RAINFALL WAS MEASURED AT 1.5".

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET  
\_\_\_\_\_

TECHNICIAN ACTIVITIES:

DRIVING TODAY. CONFIRMED SITE ACTIVITIES VIA PHONE CALL  
WITH TIMMY LEE.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-50

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-26-08

PROJECT DAY NO. 114

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 11:30 PM AM

LUNCH BREAK: -

WORK HOURS: 40

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 46 °F  
DAYTIME HIGH: 70 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

EXCAVATION & STOCKPILING PROTECTIVE COVER MATERIAL IN THE TRIPP PROPERTY BORROW AREA.

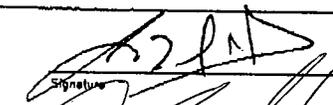
TOMMY FIELDS IS ON SITE PERFORMING AN ASBUILT ON THE IN PLACE GULL AT THE EAST AND NORTH EAST HAUL ROAD AND EXTERIOR SLOPE AROUND CELL 12.

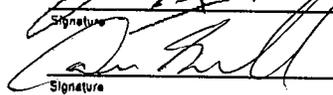
EXCAVATION OF SILT AT THE TEMPORARY DRAINAGE BERM CONSTRUCTED ON THE SLOPE OF CELL 11 COVER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ACTIVITY IN THE TRIPP PROPERTY BORROW AREA.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-27-08

PROJECT DAY NO. 115

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: BUNNY  
PM PLY CLOUDY AM CLOUDY RAIN WINDY

TEMPERATURE:  
MORNING LOW: 41 °F  
DAYTIME HIGH: 51 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

YESTERDAY'S RAINFALL TOTAL WAS MEASURED AT 0.4".  
PLACEMENT OF THE FIRST LIFT OF CLAY LINER MATERIAL ON THE EAST BERM.  
PROCESS AND COMPACTION OF THE FIRST LIFT OF CLAY LINER ON THE EAST BERM. RECENT RAIN FALL HAS PROVIDED SUFFICIENT MOISTURE.  
ROOT PICKERS ARE ON SITE WORKING.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF THE FIRST LIFT OF CLAY LINER ON THE EAST BERM. PERFORMED DRIVE CYLINDER DENSITY TESTS, FIELD GRAIN SIZES AND COLLECTED ONE PERMEABILITY SAMPLE.

RECORD PREPARED BY:

 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

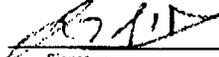
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 2-27-08

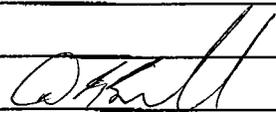
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

R.B. BAKER HAS DENT A TRACK HOLE TO BEGIN CLEARING IN THE  
EAST EXPANSION OF BORROW AREA #9.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

2-27-08

DRAINAGE DITCH

PLACEMENT OF THE FIRST LIFT OF CLAY LINER

PROCESSING OF COMPACTION OF FIRST LIFT OF CLAY LINER

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

TOE OF SLOPE

TOP OF SLOPE

TOE OF SLOPE

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

**LEGEND**

26, B

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

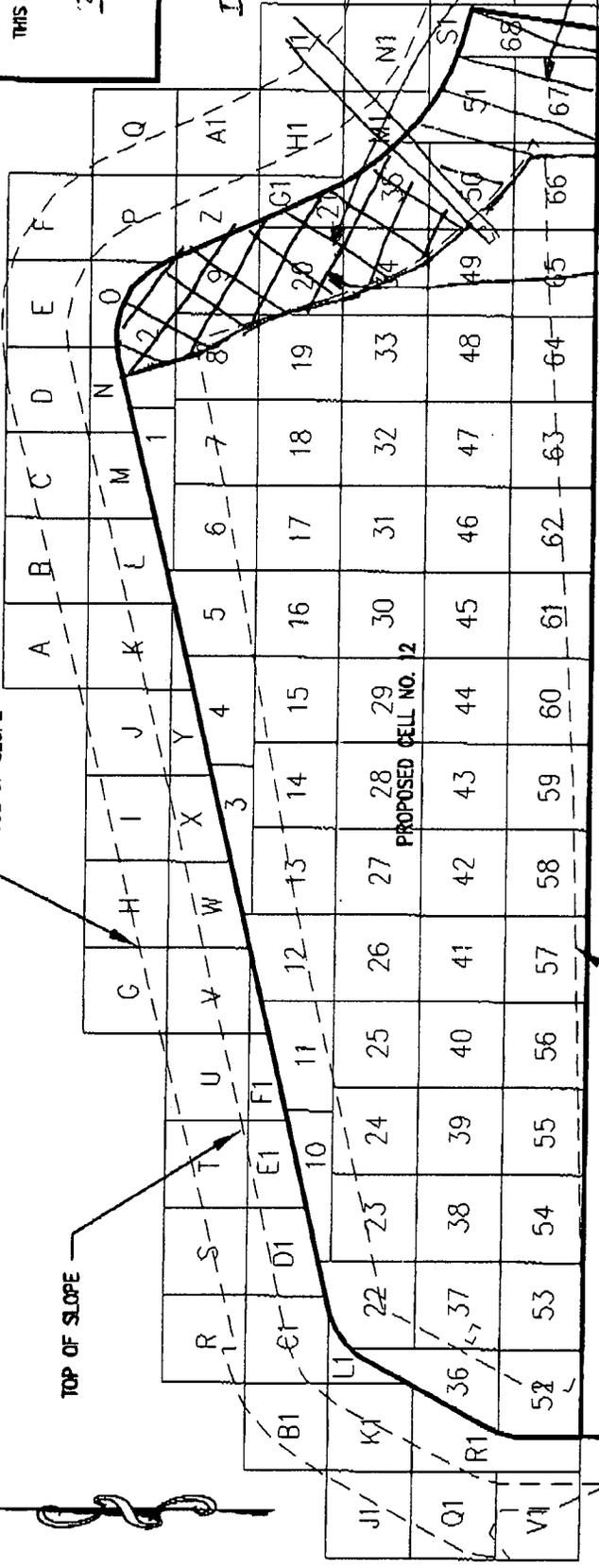
DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
BUNNELL-LAWSON ENGINEERING, INC.  
6024 PONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)258-1285 FAX: (864)258-4450

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-28-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 6:00 PM  
LUNCH BREAK: 15  
WORK HOURS: 11.0

PROJECT DAY NO. 116

VISITORS:

NAME REPRESENTING

STEVE NIGHTING R.B. BAKER

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 27 °F  
DAYTIME HIGH: 48 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

COMPACTION OF THE FIRST LIFT OF CLAY LINER MATERIAL.  
PLACEMENT AND COMPACTION OF THE SECOND LIFT OF CLAY  
LINER MATERIAL. ALL CLAY PLACED ON EAST SLOPE.  
ROOT PICKERS ARE ON SITE WORKING.  
PLACEMENT OF THE THIRD LIFT OF CLAY LINER MATERIAL.  
CONTRACTOR/CQA MEETING: R.B. BAKER WILL BEGIN FINE GRADING TOMORROW.  
MEMBRANE INSTALLATION SCHEDULED TO START 3/10/08.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED COMPACTION OF THE FIRST LIFT OF CLAY LINER. PERFORMED  
DRIVE CYLINDER DENSITY TESTS, FIELD GRAIN SIZES AND COLLECTED  
ONE PERMEABILITY SAMPLE.  
MONITORED PLACEMENT AND COMPACTION OF THE SECOND LIFT OF  
CLAY LINER. PERFORMED DRIVE CYLINDER DENSITY TESTS, FIELD GRAIN  
SIZES AND COLLECTED ONE PERMEABILITY SAMPLE.

RECORD PREPARED BY: [Signature] TED STILES

RECORD REVIEWED & APPROVED BY: [Signature] DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

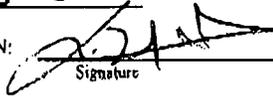
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 2-28-08

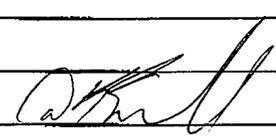
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TEJ STILES

R.B. BAKER HAS CLEARED A SECTION IN THE EAST EXPANSION OF BORROW PIT #9. THE CLEARED AREA MEASURES 150' X 325' INCLUDING THE EXISTING ACCESS ROAD. THIS DOES NOT INCLUDE THE INTERIOR SLOPE ALONG THE ACCESS ROAD. A TEST PIT WAS EXCAVATED IN THE CENTER OF THE CLEARED AREA. 0'-4' MOIST CLAY LINER MATERIAL (SIMILAR TO TRIPP PIT). 4'-10' LIGHT GRAY SANDY CLAY. TURNING TO CLAYEY SAND. WATER WAS NOT ENCOUNTERED.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

2 - 28 - 08

TOE OF SLOPE

TOP OF SLOPE

DRAINAGE DITCH

COMPACTION OF THE FIRST LIFT OF CLAY LINER

PLACEMENT & COMPACTION OF THE SECOND LIFT OF CLAY LINER

PLACEMENT OF THE THIRD LIFT OF CLAY LINER

**LEGEND**

26, 8

GRID REFERENCE NUMBER OR LETTER FOR TESTING

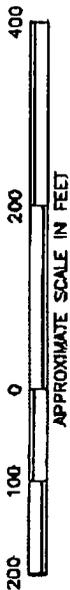
GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,386.44 S.F. = 15 ACRES

EXISTING CELL NO. 11

PROPOSED CELL NO. 12



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

1

**IBL** INC.  
BUNNELL-LAMBSON ENGINEERING, INC.  
804 POWERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE (864)288-1286 FAX (864)288-4430

DATE: 11-01-07

DRAWN: AEH

CHECKED: JAG

APPROVED: J07-1001-58

CAD: ECLF58-FSCCELL12

JOB NO: J07-1001-58

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-29-08

PROJECT DAY NO. 17

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 12.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: AM SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 27 °F  
DAYTIME HIGH: 56 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

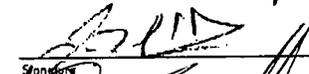
CONTRACTOR ACTIVITIES:

COMPACTION OF THE THIRD LIFT OF CLAY LINER MATERIAL, (EAST SLOPE)  
FINE GRADING AT THE WEST END IN THE CELL FLOOR.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PLACEMENT AND COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE WORKING.  
RECEIVED SIX ROLLS OF GEOSYNTHETIC CLAY LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED COMPACTION OF THE THIRD LIFT OF CLAY LINER. PERFORMED DRIVE CYLINDER DENSITY TESTS, FIELD GRAIN SIZES AND COLLECTED TWO PERMEABILITY SAMPLES.  
MONITORED PLACEMENT AND COMPACTION OF THE FOURTH LIFT OF CLAY LINER. PERFORMED DRIVE CYLINDER DENSITY TESTS, FIELD GRAIN SIZES AND COLLECTED ONE PERMEABILITY SAMPLE.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 2-29-08

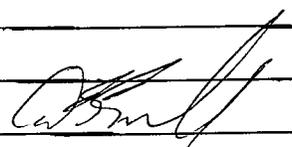
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

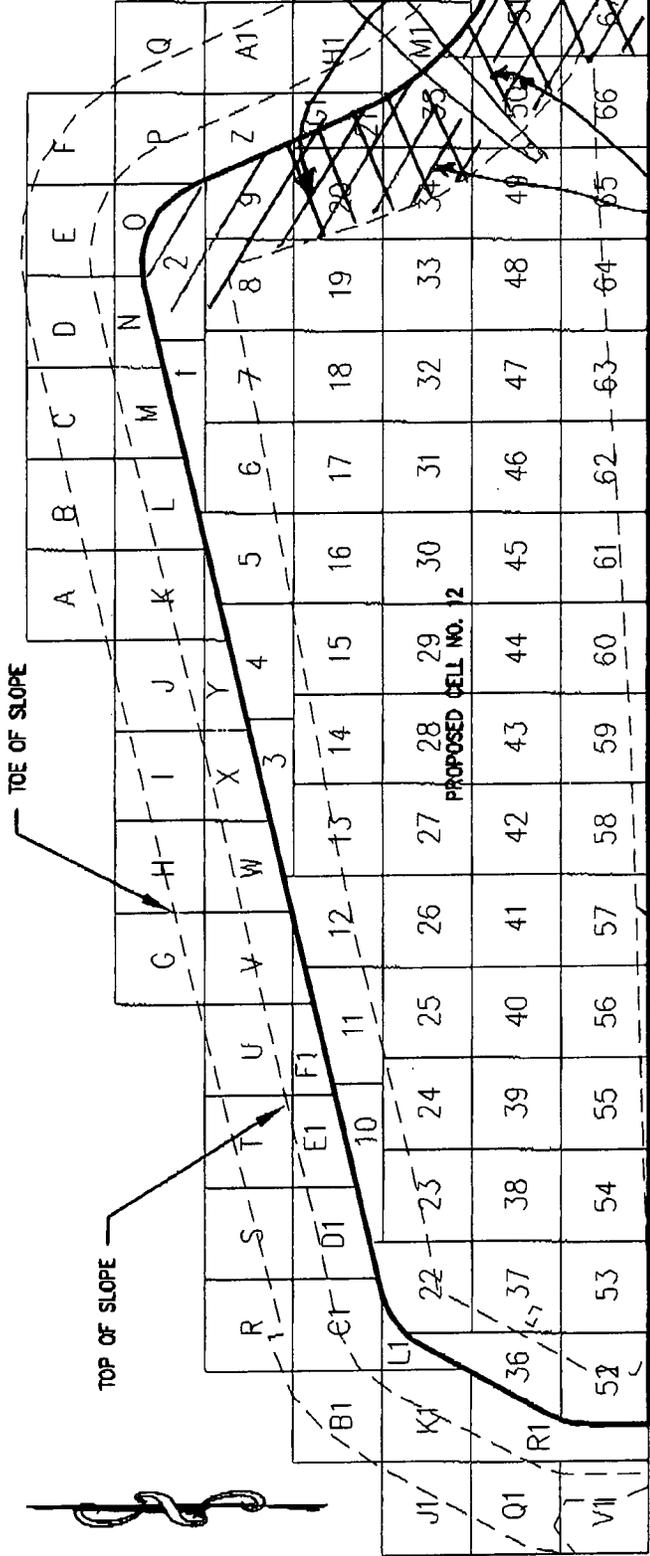
TED STILES

HAWLING STRUCTURAL FILL MATERIAL FROM PIT #9. THE MATERIAL IS BEING PLACED IN THE ACCESS ROAD SOUTH OF THE 128 RISER PIPE LOCATION.

REVIEWED: 

THIS MAP INDICATES WORK PERFORMED ON

2-29-08



AL  
PLACEMENT &  
COMPACTION OF  
STRUCTURAL FILL

COMPACTION OF  
THE THIRD LIST OF  
CLAY LINER

PLACEMENT &  
COMPACTION OF THE  
FOURTH LIST OF  
CLAY LINER

**LEGEND**

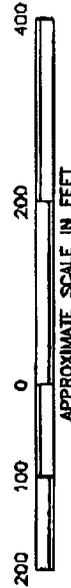
26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF  
(100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARGIS, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	 <b>BUNNELL-JAMMONS ENGINEERING, INC.</b> 6004 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)788-1285 FAX: (864)288-4430	FIGURE
CHECKED: JAG	CAD: ECLF58-FSCCELL12		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: J07-1001-58		1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-1-08  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.0

PROJECT DAY NO. 118

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY CLOUDY  WINDY  
 RAIN

TEMPERATURE:  
MORNING LOW: 48 °F  
DAYTIME HIGH: 61 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

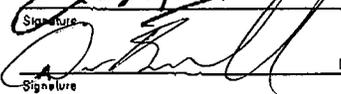
COMPACTION OF THE FOURTH LIFT OF CLAY LINER MATERIAL.  
ROOT PICKERS ARE ON SITE WORKING.  
FINE GRADING ACTIVITY IN THE WEST END OF THE CELL.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED COMPACTION OF THE FOURTH LIFT OF CLAY LINER.  
PERFORMED DRIVE CYLINDER DENSITY TESTS, FIELD GRAIN SIZES  
AND COLLECTED ONE PERMEABILITY SAMPLE.  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

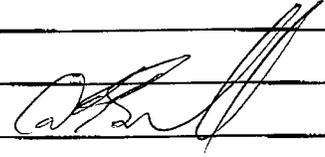
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-1-08

PAGE 2 OF 2

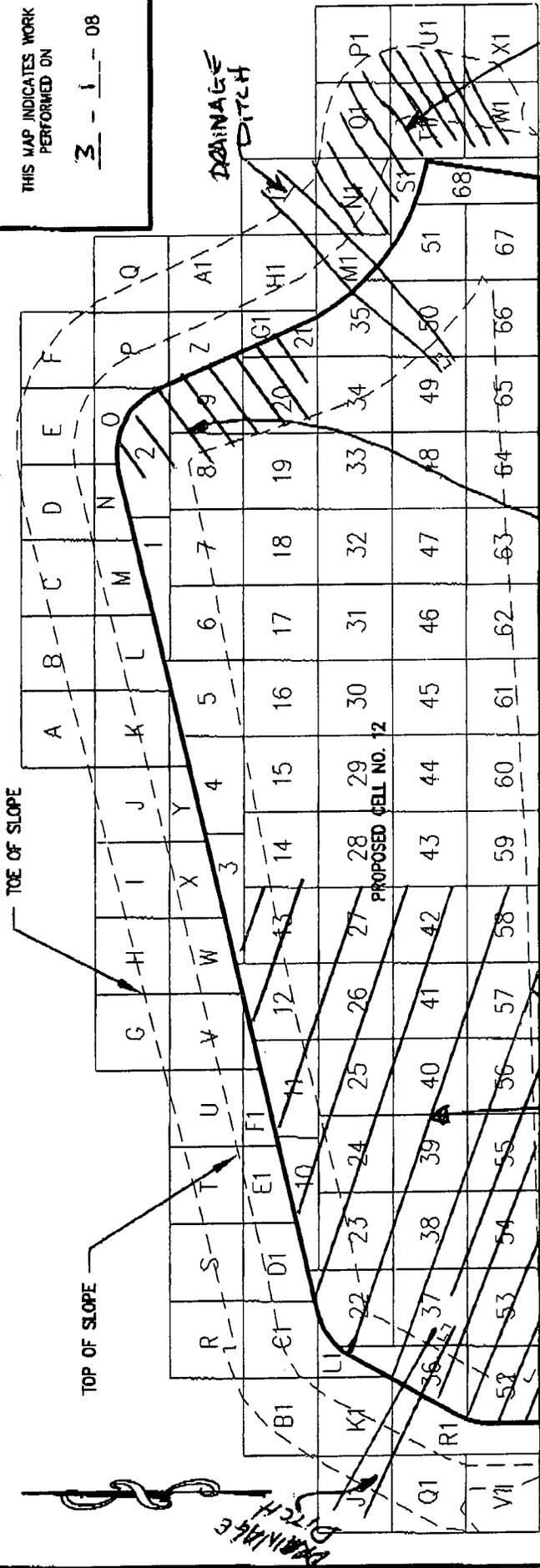
CQA TECHNICIAN:  TED STILES  
Signature

HAULING STRUCTURAL FILL MATERIAL FROM PIT #9. THE MATERIAL IS BEING PLACED SOUTH OF RISER PIPE FOR SUMP 12B.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

3-1-08



PLACEMENT OF COMPACTION OF STRUCTURAL FILL

COMPACTION OF THE FOURTH LIFT OF CLAY LINER

FINE GRADING ACTIVITY

**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO:	J07-1001-58

**BLE** INC.  
**BURNELL-LAMMONS ENGINEERING, INC.**  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1265 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE	1
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RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-2-08

PROJECT DAY NO. 119

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER:  SUNNY  CLOUDY  WINDY  
 PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 30 °F  
DAYTIME HIGH: 60 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

FINE GRADING THE EAST HALF OF THE CELL FLOOR.  
ROOT PICKERS ARE WORKING ON THE CLAY LINER SURFACE.  
MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.  
CLEANING THE EDGE OF LINER AT CELL 11.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

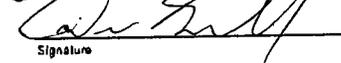
MONITORED FINE GRADING ACTIVITY.  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PERFORMED DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-2-08

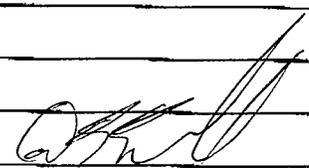
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

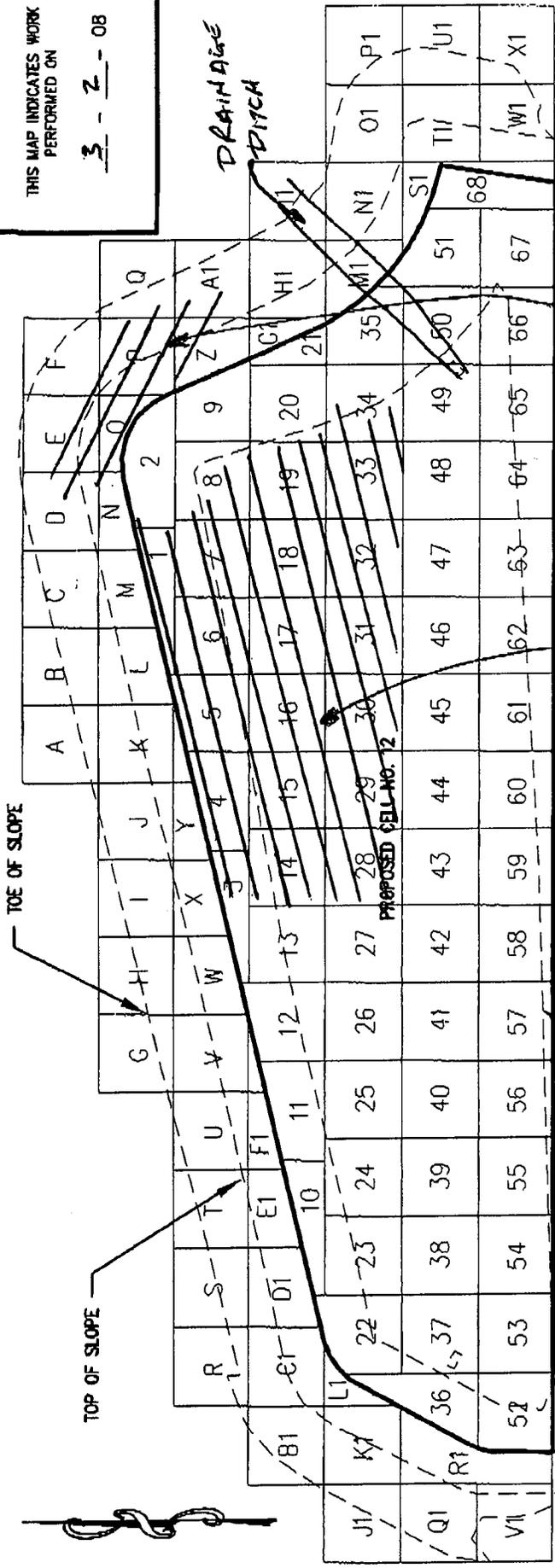
TED STILES

EXCAVATING STRUCTURAL FILL MATERIAL FROM PIT #9. THE MATERIAL IS BEING PLACED NORTH OF THE RISER PIPE AT SSMP 12B.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

3 - 2 - 08



PLACEMENT & COMPACTION OF STRUCTURAL FILL

FINE GRADING ACTIVITY

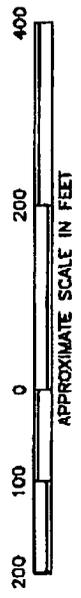
EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

GRID REFERENCE NUMBER OR LETTER FOR TESTING 26, 8

GRID AREA  $\leq 10,000$  SF (100' x 100')

26



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC112
APPROVED:		JOB NO:	J07-1001-58

**IBLE** INC.  
BUNNELL-LAUBOMB ENGINEERING, INC.  
604 POWERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (843)285-1285 FAX: (843)285-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-3-08  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.0

PROJECT DAY NO. 120

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: AM SUNNY CLOUDY WINDY  
PM PILE CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 38 °F  
DAYTIME HIGH: 71 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

FINE GRADING IN THE EAST END OF CELL 12.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVING WASHED PROTECTIVE COVER MATERIAL. THIS MATERIAL IS  
BEING STOCKPILED NORTH OF CELL 12.  
TOMMY FIELDS IS ON SITE PERFORMING THE TOP OF CLAY AS BUILT.  
ROOT PICKERS ARE WORKING THE TOP OF CLAY.  
MAINTENANCE AND PREPARATION OF CLAY LINER SURFACE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.

CONTRACTOR/COA MEETING: AEG TO MOBILIZE ON WEDNESDAY.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-3-09

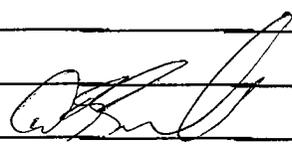
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

EXCAVATING STRUCTURAL FILL MATERIAL FROM PIT #9. THIS  
MATERIAL IS BEING PLACED NORTH OF THE RISER PIPE AT  
SUMP 12B

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

3-3-08

TOE OF SLOPE

TOP OF SLOPE

DRAINAGE DITCH

PLACEMENT OF  
COMPACTION OF  
STRUCTURAL FILL

FINE GRADING  
ACTIVITY

EXISTING CELL NO. 11

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

1

**IBL**  
BIRNELL-LAMMONS ENGINEERING, INC.  
6024 POWERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)768-1228 FAX: (864)768-4450

DRAWN: AEH DATE: 11-01-07

CHECKED: JAG CAD: ECLF58-FSC112

APPROVED: JOB NO: J07-1001-58

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-4-08  
ARRIVAL TIME: 8:00 AM  
DEPARTURE TIME: 4:00 PM  
LUNCH BREAK: —  
WORK HOURS: 8.0

PROJECT DAY NO. 121

VISITORS:  
NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES

WEATHER: SUNNY  CLOUDY  WINDY   
PARTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 60 °F  
DAYTIME HIGH: 76 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

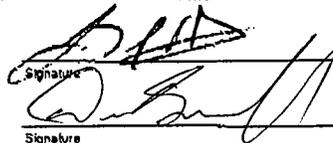
FINE GRADING THE SOUTH EAST CORNER OF THE CELL. (CLAY SURFACE).  
TOMMY FIELDS IS ON SITE PERFORMING THE TOP OF CLAY AS BUILT.  
ROOT PICKERS ARE ON SITE WORKING THE TOP OF CLAY LINER.  
MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
RECEIVING WASHED PROTECTIVE COVER MATERIAL.  
EXCAVATED SUMPS 12A AND 12B.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED  
DRIVE CYLINDER DENSITY TESTS.  
MONITORED FINE GRADING ACTIVITY IN THE CELL.  
TOP OF CLAY AS BUILT IS COMPLETE. TWO GRID POINTS, IN THE EAST  
DRAINAGE DITCH, HAVE NOT BEEN RECORDED ON THE SUBGRADE  
AND TOP OF CLAY.

RECORD PREPARED BY: TED STILES

  
Signature

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

Signature

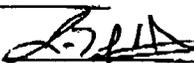
RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

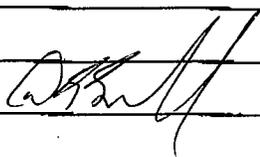
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-4-08

PAGE 2 OF 2

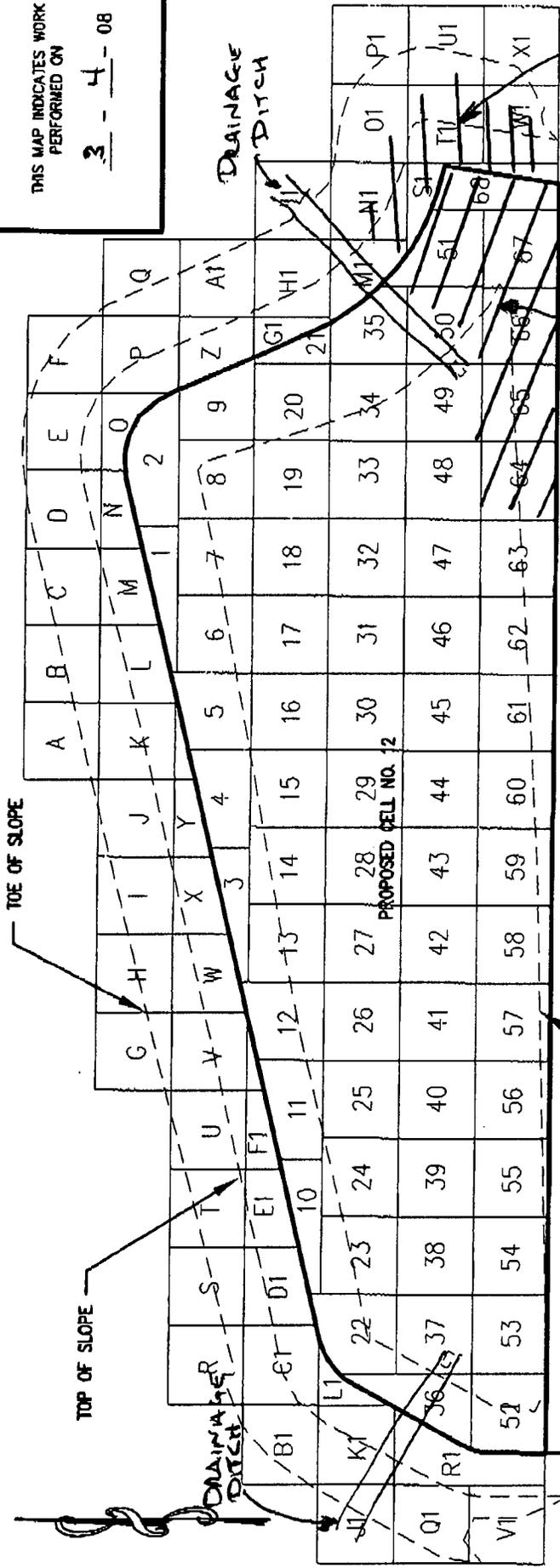
CQA TECHNICIAN:  TED STILES  
Signature

ELEVATING STRUCTURAL FILL MATERIAL FROM PIT #9. THE  
MATERIAL IS BEING PLACED SOUTH OF THE RISER PIPE IN SUMP  
12B.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

3 - 4 - 08



PLACEMENT OF COMPACTION & STRUCTURAL FILL

FINE GRADING ACTIVITY

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

EXISTING CELL NO. 11



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07
CHECKED: JAG	CAD: ECLF58-FSCCELL12
APPROVED:	JOB NO: J07-1001-58

**IBL** INC.  
**BIRNELL-LAMMONS ENGINEERING, INC.**  
 804 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE (864)286-1266 FAX (864)286-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-5-08

PROJECT DAY NO. 122

ARRIVAL TIME: 7 AM

DEPARTURE TIME: 7 PM

LUNCH BREAK:       

WORK HOURS:       

ONSITE PERSONNEL: TED STILES

VISITORS:  
NAME REPRESENTING

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 57 °C  
DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 1.3".  
THERE WAS NO CONSTRUCTION ACTIVITY TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

CONFIRMED RAINFALL TOTAL AND WORK SCHEDULE WITH  
TIMMY LEE VIA PHONE CALL.

RECORD PREPARED BY:

Ted Stiles TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell DANIEL B. BUNNELL, P.E.

PACKING LIST

CETCO  
 1500 WEST SHURE DRIVE  
 NGTON HEIGHTS IL 60004

ORDER NO:.. 000235644  
 ORDER DATE: 1/24/2008  
 SHIP DATE:.. 2/28/2008

SOLD TO: 5866  
 REPUBLIC SERVICES  
 1922 REPUBLICAN ROAD

SHIP FROM:.. CETCO CARTERSVILLE  
 FRT TERMS:.. PREPAID & ADD  
 SHIP VIA:.. AMERICO LOGISTICS

AULANDER NC 27805

SHIP TO: 01  
 EAST CAROLINA LANDFILL  
 1922 REPUBLICAN ROAD

AULANDER NC 27805

PO: 23301

PRODUCT	SIZE U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
CV-BENTOMAT ST	SFT SF	200809CV ✓	00001259	150.0	15.0	2250.0	2844.0
CV-BENTOMAT ST	SFT SF	200809CV ✓	00001260	150.0	15.0	2250.0	2794.0
CV-BENTOMAT ST	SFT SF	200809CV ✓	00001261	150.0	15.0	2250.0	2758.0
CV-BENTOMAT ST	SFT SF	200809CV ✓	00001262	150.0	15.0	2250.0	2764.0
CV-BENTOMAT ST	SFT SF	200809CV ✓	00001263	150.0	15.0	2250.0	2788.0
CV-BENTOMAT ST	SFT SF	200809CV ✓	00001264	150.0	15.0	2250.0	2772.0
						=====	
							13500.0
CV-CG 50	50B EA ✓					1.0	50.0
						=====	
							1.0

ORDER TOTALS..... 16770.0  
 TOTAL ITEMS..... 7

To: JEFF  
 HELVEY



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-7-08  
ARRIVAL TIME: 7:30 AM  
DEPARTURE TIME: 5:00 PM  
LUNCH BREAK: 1.0  
WORK HOURS: 8.5

PROJECT DAY NO. 124

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
JEFF HALVET, P.E.  
ALLEN SMITH

STEW NICHING R. Baker

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 46 °F  
DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL IN ACCORDANCE WITH  
THE REVISED DRAWING SHEET 3 OF 8, EDIT 3-3-08.

THE ANCHOR TRENCH HAS BEEN MARKED. EXCAVATION WILL COINCIDE  
WITH GEOMEMBRANE DEPLOYMENT.

RECEIVING WASHED PROTECTIVE COVER MATERIAL.

STEADY RAINFALL BEGAN AT 10:00. ALL CONSTRUCTION ACTIVITY  
HALTED AT 10:30.

AEQ IS ON SITE FOR GEOMEMBRANE INSTALLATION.

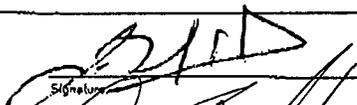
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

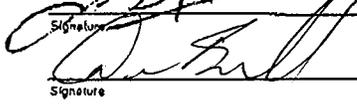
GEOMEMBRANE PRE-DEPLOYMENT MEETING WAS HELD TODAY.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

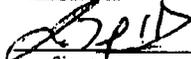
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-7-08

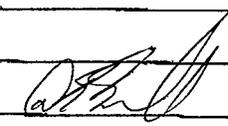
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

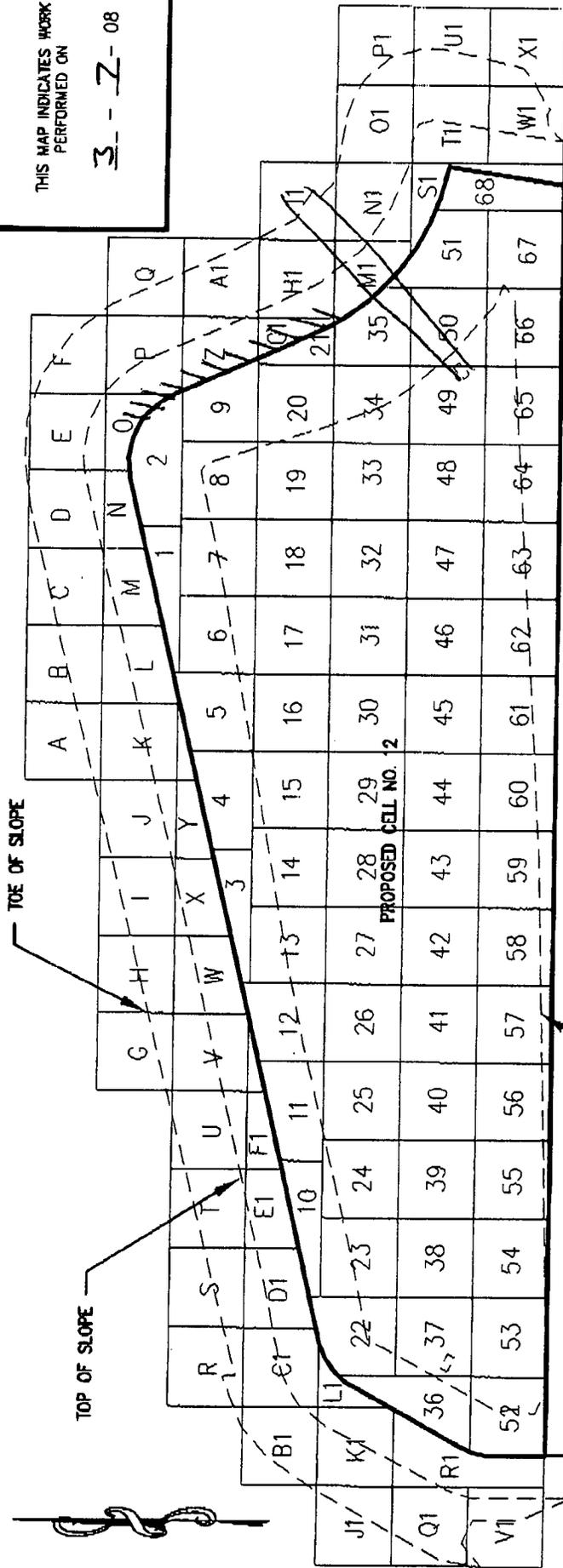
TED STILES

EXCAVATION OF CLAYEY SOILS FOR STRUCTURAL FILL FROM  
PIT #9. THE MATERIAL IS BEING PLACED NORTH OF THE  
RISER PIPE AT SUMP 12B IN ACCORDANCE WITH THE REVISED DRAWING.

Received: 

THIS MAP INDICATES WORK PERFORMED ON

3 - Z - 08



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSCCELL12
APPROVED:		JOB NO.:	JD7-1001-58

**IBL** INC.  
**BURNELL-LAMMONS ENGINEERING, INC.**  
 6004 POWERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1265 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-8-08

PROJECT DAY NO. 125

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 3:00 PM

LUNCH BREAK: -

WORK HOURS: 1.0

ONSITE BLE PERSONNEL: TED STILES

ALAN SMITH

VISITORS:  
NAME REPRESENTING

WEATHER:

Pm  
SUNNY  
PTLY CLOUDY

CLOUDY  
RAIN

WINDY 3m

TEMPERATURE:

MORNING LOW: 64°F

DAYTIME HIGH: 69°F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 1.6". RAIN IS  
CONTINUING THIS MORNING.

THERE WAS NO CONSTRUCTION ACTIVITY TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

**EQUIPMENT OF PROJECT**  
**CONSTRUCTION QUALITY ASSURANCE - CELL 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

Page 1 of 1

EQUIPMENT	DATE / DAY							COMMENTS
	3-2-08 Sunday	3-3-08 Monday	3-4-08 Tuesday	3-5-08 Wednesday	3-6-08 Thursday	3-7-08 Friday	3-8-08 Saturday	
CAT. 160N LGP ROZLER articulating VOLUM 1300 SEE ROAD	2	2	2	2	2	2	2	
CAT. 875F COMPACTOR UNWEIGHTED 4' DISCS	1	1	1	1	1	1	1	
VOLUM E360B EXCAVATOR	1	1	1	1	1	1	1	
CAT. 330 EXCAVATOR 5000 GALLON	1	1	1	1	1	1	1	
VOLUM WASTE TANKER	1	*	-	-	-	-	-	REMOVED FROM SITE
2000 GALLON WATER TRUCK	1	1	1	1	1	1	1	
UNWEIGHTED SMOOTH DRUM RAMP SPILL COMPACTOR	1	1	1	1	1	1	1	

NUMBER REFERS TO QUANTITY OF EQUIPMENT PRESENT ONSITE ON DATE INDICATED

**RECORD OF DAILY OBSERVATIONS**

**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-9-08  
ARRIVAL TIME: 7:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 9.5

PROJECT DAY NO. 126

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES  
ALLAN SMITH

WEATHER:  SUNNY  CLOUDY  WINDY  
 PFLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 34 °F  
DAYTIME HIGH: 56 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

YESTER DAY'S RAINFALL MEASURED 0.3". FOR A TOTAL RAINFALL AMOUNT OF 1.9" SINCE FRIDAY MORNING.

REG 15 ON SITE STATIONING ROLLS OF GEDMEMBRANE AND FILLING SAND BAGS. THEY HAVE FILLED 2000 SAND BAGS. THEY DEPARTED SITE AT 12:30 PM. NO GEDMEMBRANE WAS DEPLOYED.

MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.

ROOT PICKERS ARE ON SITE WORKING THE CLAY LINER SURFACE.

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

EXCAVATING THE ANCHOR TRENCH ADJOINING PREPARED SUBGRADE

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED ACTIVITY ON THE CLAY LINER SURFACE.

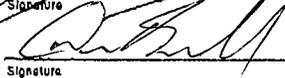
PERFORMED THREE HAND AUGERS TO CONFIRM CLAY THICKNESS. EACH POINT WAS AUGERED TO SUBGRADE, VISIBLE AS WHITE AND YELLOW SANDY SOILS. POINTS 949 (N-13574.50 E-7322.75) 29"; 950 (N-13554.76 E-7325.13) 30"; 951 (N-13563.44 E-7324.11) 28".

MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL. PERFORMED DRIVE CYLINDER DENSITY TESTS.

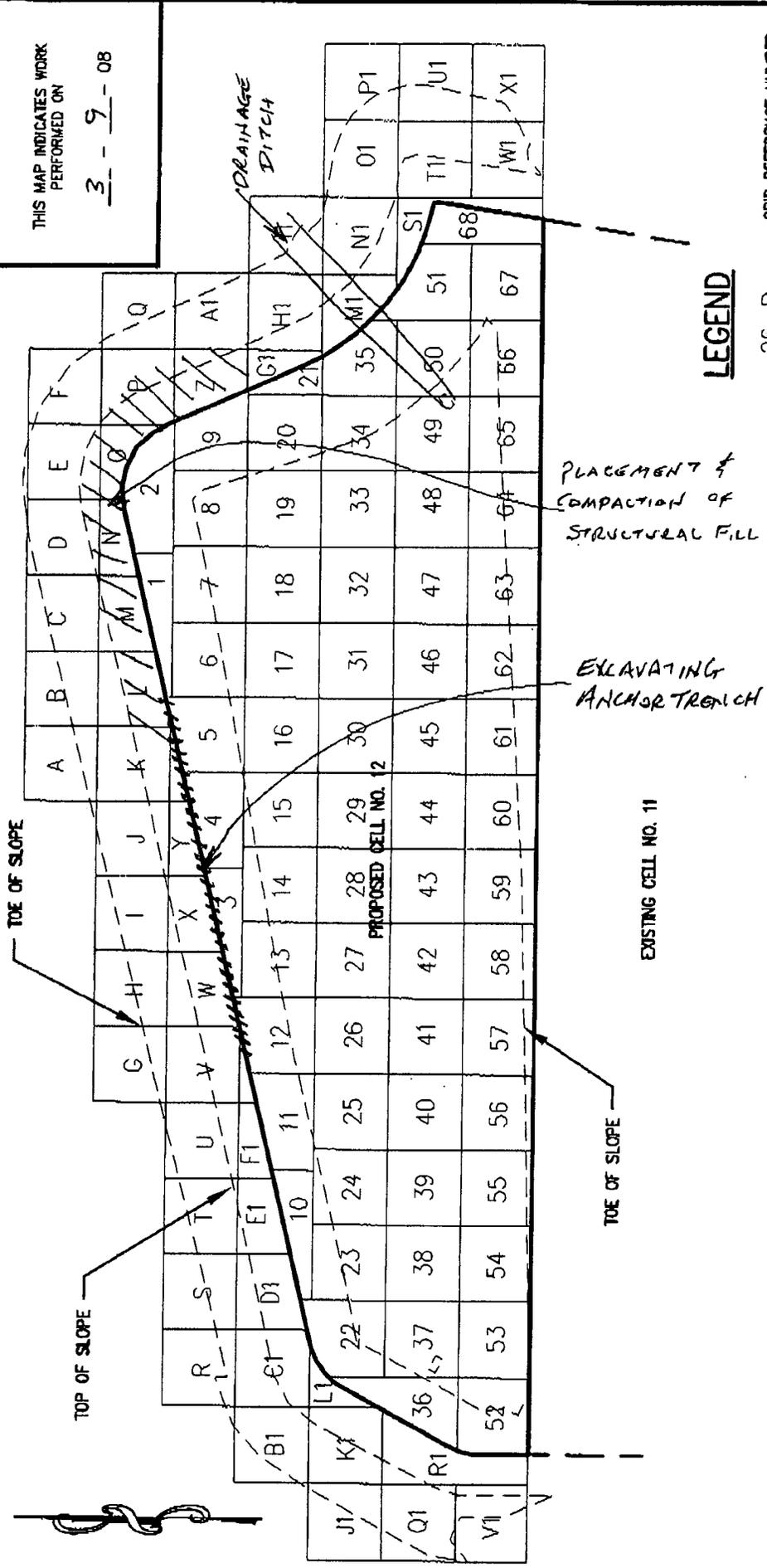
RECORD PREPARED BY:

  
Signature \_\_\_\_\_ TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature \_\_\_\_\_ DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
3-9-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07	<p><b>BURWELL-LAWSON ENGINEERING, INC.</b>          6004 PONDS COURT          GREENVILLE, SOUTH CAROLINA 29615          PHONE (864)288-1285 FAX (864)288-4430</p>	FIGURE	1
CAD:	ECIF58-FSCCELL12		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
JOB NO:	J07-1001-58			

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-9-08

PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

EXCAVATION OF CLAYEY SOILS AS STRUCTURAL FILL FROM PIT #9.  
THE MATERIAL IS BEING PLACED IN THE ACCESS ROAD NORTH OF  
THE RISER PIPE AT SUMP 12 B.

- AS NOTED ON DAILY, AEG LEFT SITE AT 12:30. THEY DID NOT  
ATTEMPT TO DEPLOY LINER. NO SAND BAGS WERE STATIONED IN  
THE CELL. AT 12:30 APPROXIMATELY 120,000 SF OF SURFACE WAS  
PREPARED. WEATHER CONDITIONS WERE SUNNY, 50°, WITH A LIGHT  
BREEZE.

REVIEW:



# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-9-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY / WINDY

Temperature:  
Daytime high 56  
Morning/Evening low 34

BLE Personnel: Ted Stiles  
Allen Smith

Visitors: \_\_\_\_\_

Site Activities: AGG IS FILLING SAND BAGS AND STAGING ROLLS OF GEOMEMBRANE LINER IN PREPARATION OF DEPLOYMENT.

Panels Deployed: from   /   to   /  

Total Square Footage (FML): \_\_\_\_\_  
Cumulative Square Footage (FML): \_\_\_\_\_

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
Machine No.	Welder	Machine No.	Welder
AM	_____	AM	_____
AM	_____	AM	_____
PM	_____	PM	_____
PM	_____	PM	_____

Trial Seam Comments: See FML Table 2

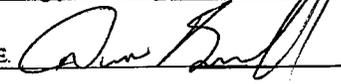
Total Length of Seam (lf)   /  

Non-destructive Testing  
Air Channel \_\_\_\_\_  
Vacuum \_\_\_\_\_  
Other Methods \_\_\_\_\_

Destructive Test Samples  
Identified \_\_\_\_\_  
Cut \_\_\_\_\_  
Field Tested \_\_\_\_\_

Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE. ROOT PICKERS. BEGAN EXCAVATION OF THE ANCHOR TRENCH.

Report Prepared By: Ted Stiles 

Report Reviewed By: Daniel B. Bunnell, P. E. 

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-10-08

PROJECT DAY NO. 127

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 9:30 PM

LUNCH BREAK: .5

WORK HOURS: 14.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

ALLEN SMITH

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 32 °F  
DAYTIME HIGH: 61 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

GEOMEMBRANE LINER   
COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.  
ROAT PICKERS ARE ON SITE WORKING ON THE CLAY LINER SURFACE.  
DEPLOYMENT OF SMOOTH GEOMEMBRANE ON THE CELL FLOOR.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

CONTRACTOR/CQA MEETING: SCHEDULE FOR BACKFILLING EAST DRAINAGE  
DITCH TO BE DETERMINED BY AEG'S PROGRESS ON TUESDAY 3-11-08. TWO  
CERTIFICATION POINTS REQUIRED TO COMPLETE AS BUILT ON SUBGRADE AND  
TOP OF CLAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE DEPLOYMENT.  
PERFORMED TWO DRIVE CYLINDER DENSITY TESTS ON THE  
STRUCTURAL FILL PLACEMENT.

RECORD PREPARED BY:

*Ted Stiles*  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

*Daniel Bunnell*  
Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-10-08

PAGE 2 OF 2

CQA TECHNICIAN:

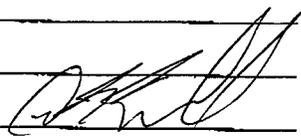
  
Signature

TED STILES

EXCAVATING CLAYEY SOILS FOR STRUCTURAL FILL FROM  
PIT #9. THE MATERIAL IS BEING PLACED NORTH OF THE  
RISER PIPE AT SWAMP 12B.

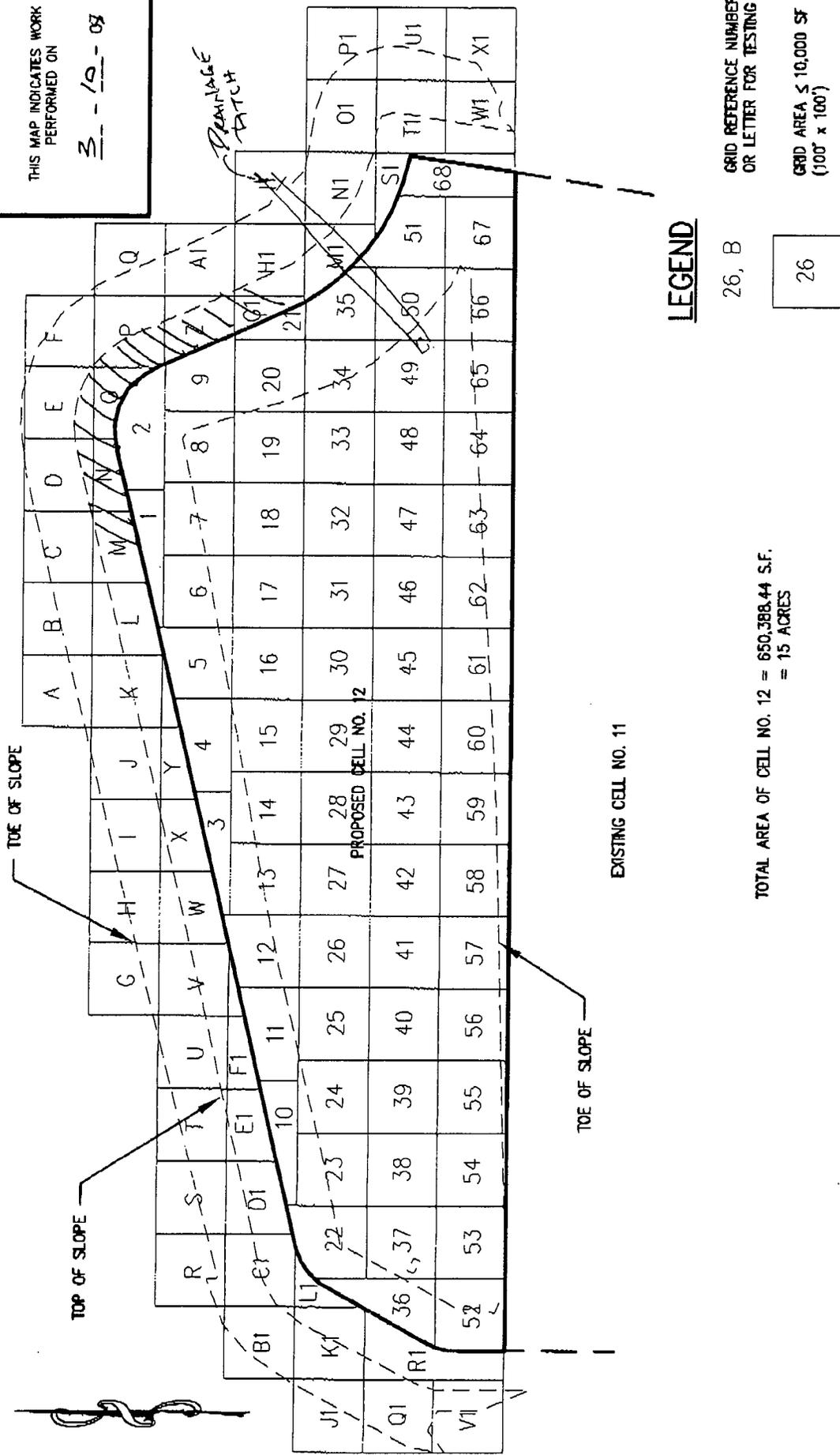
FILL PLACEMENT -  $\approx$  126,833 SF

SEAMING - FUSION 5302 L.F.

REVIEWED: 

THIS MAP INDICATES WORK PERFORMED ON

3-10-09



**LEGEND**

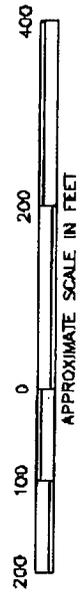
26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	 <p><b>BUNNELL-LAMMONG ENGINEERING, INC.</b> 804 PONDERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE (864)288-1285 FAX (864)288-4430</p>	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIG: <b>1</b>
CHECKED: JAG	CAD: ECLF58-FSCCELL12			
APPROVED:	JOB NO: J07-1001-58			

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J97-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-12-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY  
Temperature:  
Daytime high: 61  
Morning/Evening low: 32

BLE Personnel: Ted Stiles  
Allen Smith

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: DEPLOYMENT OF SMOOTH GEOMEMBRANE LINER.  
\_\_\_\_\_  
\_\_\_\_\_

Panels Deployed: from S-1 to S-22

Total Square Footage (FML): 126868  
Cumulative Square Footage (FML): 126868

FUSION WELDED SEAMS		TRIAL SEAMS		EXTRUSION WELDED SEAMS	
	Machine No.	Welder		Machine No.	Welder
AM	<u>W19</u>	<u>SB</u>	AM	_____	_____
AM	<u>D10</u>	<u>AK</u>	AM	_____	_____
	<u>W4</u>	<u>SN</u>			
PM	<u>D10</u>	<u>AK</u>	PM	_____	_____
PM	<u>W19</u>	<u>SB</u>	PM	_____	_____
	<u>W4</u>	<u>SN</u>			
Trial Seam Comments: <u>See FML Table 2</u>					

Total Length of Seam (lf) 5302

Non-destructive Testing  
Air Channel: ✓  
Vacuum: -  
Other Methods: -

Destructive Test Samples  
Identified: 11  
Cut: -  
Field Tested: -

Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE. ROOT PICKERS.  
\_\_\_\_\_  
\_\_\_\_\_

Report Prepared By: Ted Stiles

Report Reviewed By: Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

3-10-08

TOE OF SLOPE

TOP OF SLOPE

TOE OF SLOPE

PROPOSED CELL NO. 12

EXISTING CELL NO. 11

SMOOTH GEOMEMBRANE DEPLOYMENT

NOTE: TIE IN SEAM AT CELL 11 WAS NOT PERFORMED YET

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

LEGEND

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE 4

GEOMEMBRANE DEPLOYMENT SKETCH  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL**  
BUNNELL-LANNORS ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1285



DATE:	11-01-07
AEH	
CAD:	ECLF58-CELL12GDS
JAG	
JOB NO:	J07-1001-58



**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF GEOMEMBRANE PRE-DEPLOYMENT MEETING**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Date of Meeting: March 7, 2008

Meeting Attendees:

<u>Name</u>	<u>Company</u>
Mr. Bill Cooksey	East Carolina Environmental, Inc.
Mr. Mitch Hoggard	East Carolina Environmental, Inc.
Mr. Eddie Keodonangsy	American Environmental Group, Ltd.
Mr. Jeff Helvey, P.E.	Bunnell-Lammons Engineering, Inc.
Mr. Allen Smith	Bunnell-Lammons Engineering, Inc.
Mr. Ted Stiles	Bunnell-Lammons Engineering, Inc.

---

Meeting Directed and Recorded by: Mr. Helvey.

1) Site Requirements:

- ◆ Hours of operation – Construction access as needed. 7:00 a.m. to 7:00 p.m. Sunday to Sunday
- ◆ Meetings: Each morning to discuss planned activities for day.
- ◆ Telephone/Fax machine are available at landfill.
- ◆ Provide drinking water for own personnel.

2) Deployment:

- ◆ Material on site has met manufacturers and QA conformance testing.
- ◆ Installer will provide roll numbers - BLE will mark panel and roll during deployment.
- ◆ Protective “rub sheet” under all equipment (generators and hot seaming machines).

3) Trial Welds (Preweld)

- ◆ Trial welds for each machine/each welder at start-up (am) and after midday break (pm).
  - ◆ Each welder will perform a trial weld for each machine he uses.
  - ◆ Each machine will have a trial weld for each welder that uses it.
- ◆ Trial weld required if machine goes offline for repair.
- ◆ BLE will observe trial welds.
- ◆ Five peel/Five shear for each trial weld.

- ◆ Minimum strength requirements:
  - Fusion: 91 ppi peel and 120 ppi shear
  - Extrusion: 78 ppi peel and 120 shear
- ◆ Archive sample of trial weld will be kept.

#### 4) Seaming

- ◆ Welder will write information at start of seam - information required:
  - Machine number
  - Welder name
  - Speed
  - Temperature
  - Date
- ◆ Overlap in direction of leachate flow (shingling).
- ◆ Sufficient overlap for welding - adequate overlap for peel testing of both tracks.
- ◆ No cross seams or seams parallel with slope within 5 feet of slope toe.

#### 5) Nondestructive Testing

- ◆ Air Channel Testing
  - Minimum 30 PSI.
  - Hold for minimum 5 minutes
  - No more than 3 PSI drop.
- ◆ Vacuum Testing
  - Vacuum pressure minimum 3 PSI or 5 inches of mercury.
  - Hold for 15 seconds.
  - Maintain 3-inch overlap.
- ◆ All air channel and vacuum testing must be observed by BLE.

#### 6) Destructive Testing

- ◆ QC destructive testing every 500 feet of seam.
- ◆ QA destructive testing every 500 feet of seam.
- ◆ QA destructive testing will not be performed for each QA destructive sample until completion of QC field testing for each sample.
- ◆ Five peel and Five shear tests for each destructive sample for CQA testing.
- ◆ Five peel and Five shear tests for each destructive sample for CQC testing.
  - ◆ No failing coupons allowed.
- ◆ Minimum strength requirements – See trial weld.
- ◆ BLE CQA personnel will locate mark and layout each destructive sample.
- ◆ Failing Destructive Samples test locations must be bracketed by passing Destructive Samples tests at each end. The bracketing must be from a seam performed by the same welder and machine that welded the failing seam. If necessary, seams welded on previous days will be sampled until the failing seam is bound by a passing on the “Before” end. If necessary, seams welded after the day the failing Destructive Samples will be sampled until the failing seam is bound by a passing on the “After” end.

- ◆ Trial welds are not acceptable for bracketing a failing Destructive Sample.

7) Repairs

- ◆ No bead repair of any full liner penetration.
- ◆ No extrusion welding of unsatisfactory fusion welds.
- ◆ BLE will mark repairs with number enclosed in circle after vacuum testing is completed.
- ◆ Continuous panel seam repairs are to be capped.

8) General Information

- ◆ FML installer will be responsible for initiating, monitoring and supervising all safety programs related to their operations and activities.
- ◆ Collection and disposal of litter, debris and scrap related to geomembrane and its installation will be the responsibility of installer. Clean up should be performed daily.
- ◆ Geomembrane deployment by installer indicates the acceptance of subgrade surface stability for deployment. Both Installer and BLE will complete acceptance sheets for subgrade at the end of each day of deployment.
- ◆ Owner and CQA Engineer determined locations and number of stormwater flaps. These locations are shown on the plans.
- ◆ 6-oz geotextile installation may be sewn or heat bonded.
- ◆ The 6-oz geotextile is to be deployed in the floor of the cell only.
- ◆ No smoking is permitted on liner.

Respectively submitted: \_\_\_\_\_

Mr. Jeffrey C. Helvey, P.E.  
Project Engineer  
Registered, NC #33318





**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF COA ENGINEER'S SITE VISIT**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Date of Visit:** March 11, 2008

**Site Visit by:** Daniel B. Bunnell, P.E.  
Project CQA Engineer

**Weather Conditions:** Partly cloudy – Mid 60's

**Project Status:** FML Installation

---

The purpose of the CQA Engineer's site visit was to observe the progress of the installation of the geomembrane (FML) in Cell No. 12 and to observe the surface finish preparation of the compacted clay liner in advance of the remaining FML deployment. Mr. Bunnell was met and accompanied at the site Mr. Ted Stiles, the on-site BLE CQA Engineering Technician.

The clay liner surface preparation and earthwork was being performed by R.B. Baker Construction Company, Inc. (Baker). FML deployment was being performed by American Environmental Group, Ltd. (AEG).

Baker was continuously smooth drum rolling the surface of the compacted clay liner in advance of FML deployment. Deployment was drawing to a conclusion for the day, and the entire exposed surface of the compacted clay liner was being wetted by the water tanker truck.

Baker was also in the process of placing compacted structural fill to form the remaining portion of the eastern access roadway embankment. The borrow soils were being obtained from the eastern portion of Borrow Area No. 9. Excavation was being made with a track excavator making a cut of approximately the upper 10 feet of soils in the newly opened portion of Borrow Area No. 9. The excavated soils were being hauled to the placement area in the eastern structural fill embankment utilizing articulated dump trucks. Structural fill was spread with a bull dozer and compacted with a CAT 815 footed compacter. Mr. Timmy Lee, the Baker site superintendent, indicated that the storm water drainage trench which had been left open in the eastern berm would be filled with structural fill beginning tomorrow (Wednesday, March 12, 2008) to permit liner deployment on Thursday. Materials used for the backfill of the trench excavation would be obtained from Borrow Pit No. 9. Soils to be used in this backfill will be the sandy clays and clayey sands from the borrow pit.

The Tripp Borrow Area was observed. No additional excavation was currently being performed from the Tripp Borrow Area as the remaining soils within the borrow area were being reserved for use as native protective cover sands. The soils exposed in the Tripp Borrow Area consisted of a light tan and brown slightly silty to silty fine to medium sand, suitable for use as protective cover. Baker has been continuing to pump water from

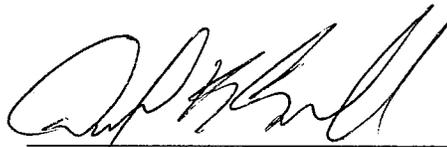
the borrow area and the majority of the sands were above the water table and appeared dry and readily useable for protective cover.

Textured FML was being deployed on the north slope and smooth FML on the floor and the shorter south slope as indicated on the drawings. The deployment had started at the high point of the cell. The panels were being deployed from the north berm in a north to south direction. Deployment was advancing to the east and a total of approximately 250,000 square foot had been deployed at the time of this site observation. Deployment had progressed by the end of the day to the point where textured liner would be utilized for the remainder of the south and east slopes. The overlap of individual panels was observed and the panels were properly shingled. Textured FML had extended onto the floor a distance of approximately 10 feet beyond the toe of the slope where the seam to smooth FML was made as desired.

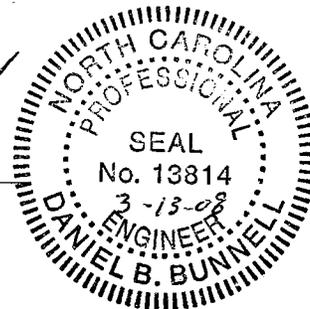
Mr. Lee indicated that the fill for the embankment roadway along the north edge of the cell would be completed by approximately Wednesday, March 19, 2008. The installation of the required groundwater monitoring well can proceed at that time.

In summary, site observations by our CQA Engineer and discussion of the project with on-site CQA engineering technician indicate that the clay surface preparation and liner deployment are in accordance with the project Plans, Specifications and the CQA Manual.

Respectively submitted by:



Daniel B. Bunnell, P.E.  
Project CQA Engineer  
Registered, NC No. 13814



Distribution: Bill Hodges, P.E.  
Bill Cooksey, P.E.  
Ray Hoffman, P.E.  
Steve Nichting  
Jeff Helvey, P.E.  
Mark Preddy, P.G.  
Ted Stiles

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-11-08

PROJECT DAY NO. 128

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 8:30 PM

LUNCH BREAK: 0.5

WORK HOURS: 13.5

VISITORS:

NAME

REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

STEVE NICHING R.B. BAKER

ALLEN SMITH

DAN BUNNELL, P.E.

WEATHER: SUNNY AM, PLY CLOUDY PM, CLOUDY, RAIN, WINDY

TEMPERATURE: MORNING LOW: 45 °F, DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

EXTENDED THE ANCHOR TRENCH ALONG THE NORTH BERM.  
MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.  
ROOT PICKERS ARE WORKING THE CLAY LINER SURFACE.  
DEPLOYMENT OF GEOMEMBRANE LINER.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
NORTH EDGE OF TEXTURED GEOMEMBRANE LINER HAS BEEN  
PLACED IN THE ANCHOR TRENCH.  
PLASTIC FUSION FABRICATORS IS ON SITE FUSING EXTENSIONS  
TO THE 8" X 4" TEES AND CROSSES.  
QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CRA ON GEOMEMBRANE LINER.  
PERFORMED TWO DRIVE CYLINDER DENSITY TESTS.

RECORD PREPARED BY:

*[Signature]*

TED STILES

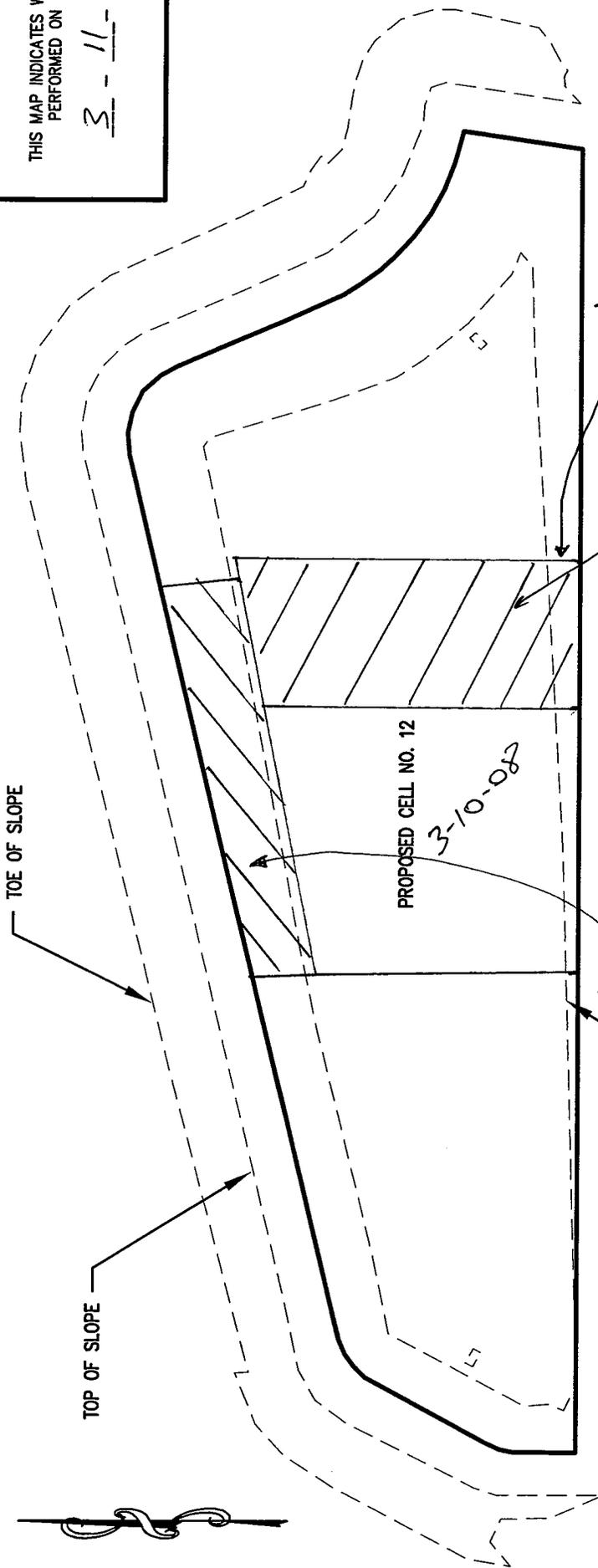
RECORD REVIEWED & APPROVED BY:

*[Signature]*

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3-11-08



**LEGEND**

TEXTURED BEGINS ON SOUTH SLOPE.

SMOOTH GEOMEMBRANE DEPLOYMENT

NOTE: TIE IN SEAM AT CELL 11 WAS NOT PERFORMED

TEXTURED GEOMEMBRANE DEPLOYMENT NORTH SLOPE

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 550,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-CELL12GDS
APPROVED:		JOB NO:	J07-1001-58

**IBLE** INC.  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
 8004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 (864)288-4430

GEOMEMBRANE DEPLOYMENT SKETCH  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**4**

**RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS**

**CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-11-08

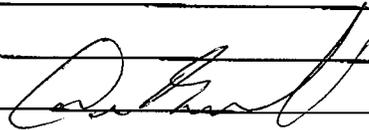
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

EXCAVATION OF CLAYEY SOILS FOR STRUCTURAL FILL.  
THE MATERIAL WAS PLACED NORTH OF THE RISER PIPE  
AT CELL 12B. THE BORROW SOILS WERE OBTAINED  
FROM BORROW PIT #9.

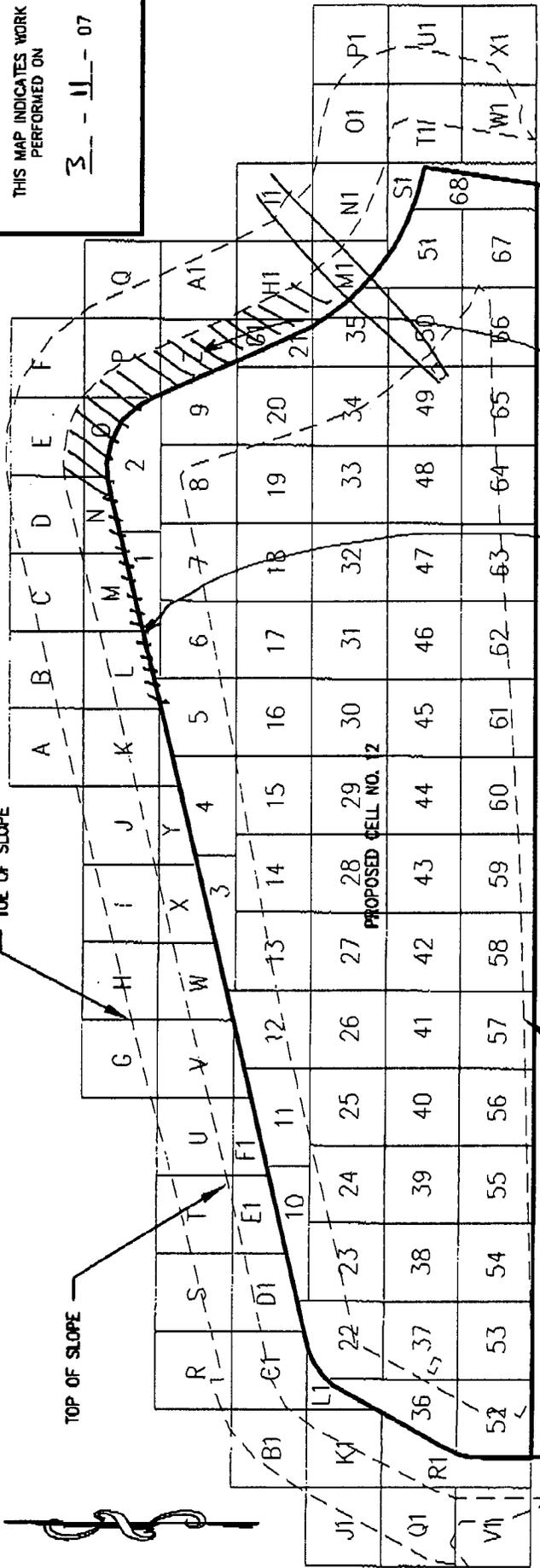


THIS MAP INDICATES WORK PERFORMED ON

3 - 11 - 07

TOE OF SLOPE

TOP OF SLOPE



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26 GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: ECLF58-FSCCELL12 JOB NO: J07-1001-58		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <b>1</b>
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# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
SUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-59

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-11-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY

Temperature:  
Daytime high 66  
Morning/Evening low 45

BLE Personnel: Ted Stiles  
Allen Smith  
RAN BUNNELL, PE

Visitors: STEVE HICKING

Site Activities: DEPLOYMENT OF SMOOTH AND TEXTURED GED MEMBRANE LINER. EDGE OF LINER ALONG THE NORTH BERM HAS BEEN PLACED IN THE ANCHOR TRENCH. PERFORMED MINIMAL REPAIRS.

Panels Deployed: from T-1 to T-22  
S-23 S-36

Total Square Footage (FML): 114965  
Cumulative Square Footage (FML): 241833

TRIAL SEAMS				
FUSION WELDED SEAMS			EXTRUSION WELDED SEAMS	
	Machine No.	Welder	Machine No.	Welder
AM	<u>D10</u>	<u>AK</u>	AM	_____
AM	<u>W19</u>	<u>SB</u>	AM	_____
	<u>W4</u>	<u>SN</u>		_____
PM	<u>W19</u>	<u>SB</u>	PM	<u>G29</u>
PM	<u>W4</u>	<u>SN</u>	PM	<u>EX</u>
	<u>D10</u>	<u>AK</u>		_____

Trial Seam Comments: See FML Table 2

Total Length of Seam (lf) 5005/10377

Non-destructive Testing  
Air Channel ✓  
Vacuum —  
Other Methods —

Destructive Test Samples  
Identified 10/21  
Cut —  
Field Tested —

Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE. ROOT PICKERS. CONTINUED EXCAVATION OF THE ANCHOR TRENCH.

Report Prepared By:

Ted Stiles

Report Reviewed By:

Daniel B. Bunnell, P. E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-12-08

PROJECT DAY NO. 129

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 10:30 PM

LUNCH BREAK: \_\_\_\_\_

WORK HOURS: 16.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

ALLEN SMITH

WEATHER: SUNNY  
PTLY CLOUDY

CLOUDY  
RAIN WINDY

TEMPERATURE:  
MORNING LOW: 52 °F  
DAYTIME HIGH: 68 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

MAINTENANCE AND PREPARATION OF CLAY LINER SURFACE.  
ROOT PICKERS ARE WORKING THE CLAY LINER SURFACE.  
PLACEMENT AND COMPACTION OF CLAYEY SOILS AS STRUCTURAL  
FILL AND CLAY LINER IN BACK FILLING THE EAST DRAINAGE DITCH.  
RECEIVED WASHED PROTECTIVE COVER MATERIAL.  
RECEIVED 24 OZ. GEOTEXTILE AND PRECUT ROLLS OF 8.05X  
GEOTEXTILE FOR THE 4" PERFORATED PIPE WRAP.  
DEPLOYMENT OF GEOMEMBRANE LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE LINER  
PERFORMED DRIVE CYLINDER DENSITY TESTS AND COLLECTED  
PERMEABILITY SAMPLES ON THE CLAY LINER BACKFILL AT  
THE EAST DRAINAGE DITCH.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-12-08

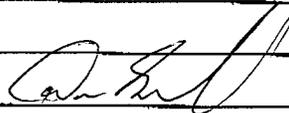
PAGE 2 OF 2

QQA TECHNICIAN:

  
Signature

TED STILES

- PLASTIC FUSION FABRICATORS IS FUSING 4" PERFORATED PIPE WITH CAPS.
- MINIMAL BACKFILL HAS BEEN PLACED IN THE ANCHOR TRENCH AT SEVERAL LOCATIONS TO SECURE THE GEMEMBRANE.



RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-12-08

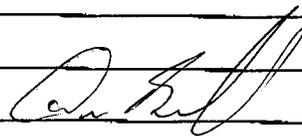
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

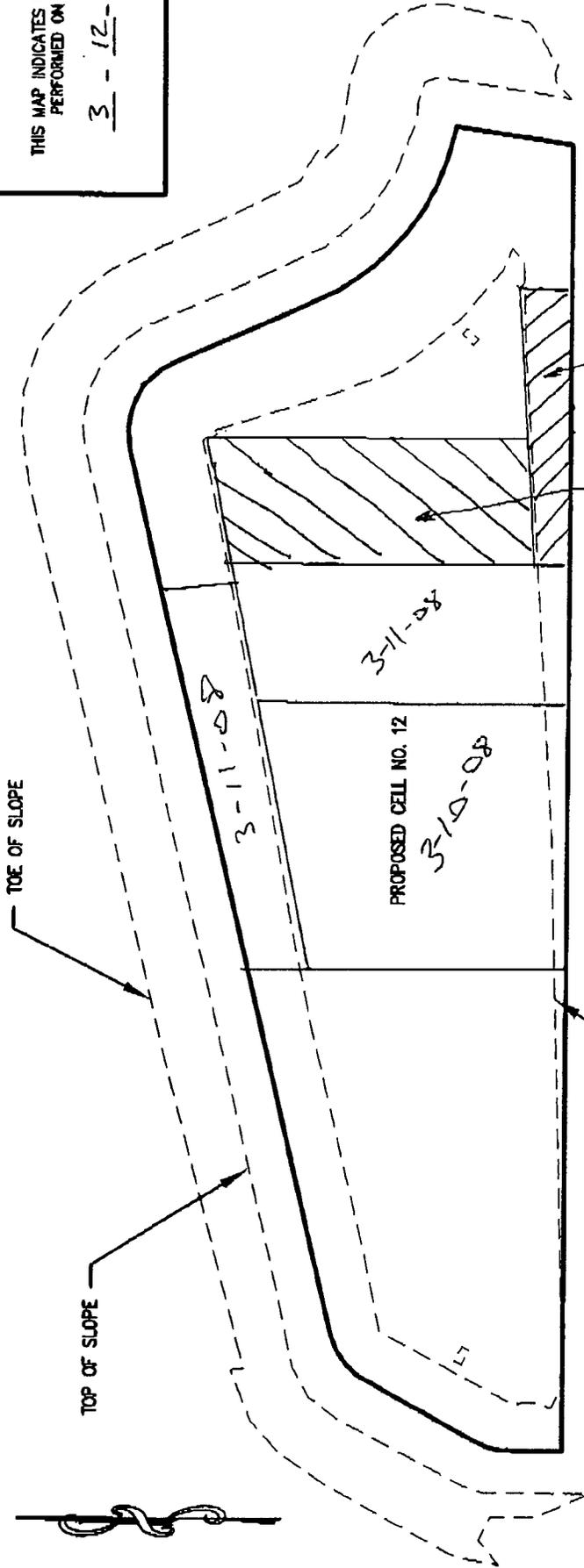
TED STILES

EXCAVATION OF CLAYEY SILTS AS STRUCTURAL FILL AND  
CLAY LINER MATERIAL FROM PIT # 9. THE MATERIAL  
WAS PLACED AND COMPACTED IN THE EAST DRAINAGE DITCH.



THIS MAP INDICATES WORK PERFORMED ON

3 - 12 - 08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

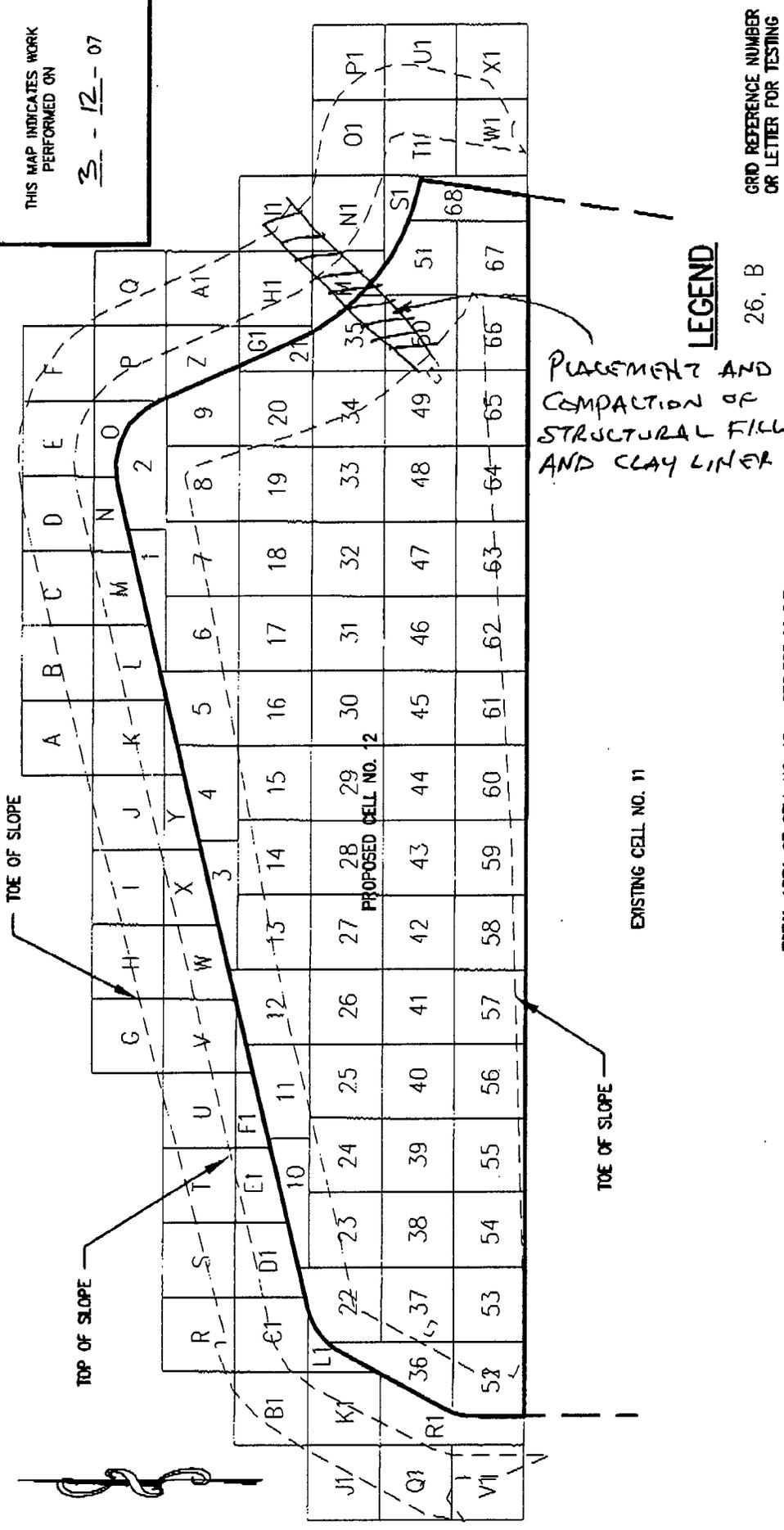
TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



DATE:	11-01-07
AEH	
ENGINEER:	JAG
PROJECT:	J07-1001-58
FIGURE:	4
GEOMEMBRANE DEPLOYMENT SKETCH EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
<b>BLE</b> BUNNELL-JARBOONS ENGINEERING, INC. 6004 FONDERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)788-1285 FAX: (864)788-4430	

THIS MAP INDICATES WORK PERFORMED ON

3-12-07



**LEGEND**

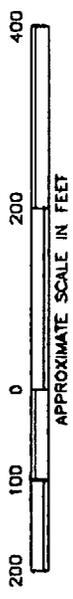
GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF  
( $100' \times 100'$ )

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE:	11-01-07	FIGURE <b>1</b>	
	CHECKED: JAG	CAD:		ECLF58-FSC01.12
	APPROVED:	JOB NO.:		J07-1001-58
<b>IBLB</b> BUNNELL-LAMBORN ENGINEERING, INC. 6004 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)286-1285 FAX: (864)286-4430			FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J97-1091-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-12-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY/WINDY  
Temperature:  
Daytime high 68  
Morning/Evening low 52

BLE Personnel: Ted Stiles  
Allen Smith  
\_\_\_\_\_  
\_\_\_\_\_

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: DEPLOYMENT OF SMOOTH AND TEXTURED GEOMEMBRANE LINER.  
\_\_\_\_\_  
\_\_\_\_\_

Panels Deployed: from T-23 to T-39  
S-37 S-53

Total Square Footage (FML): 118002  
Cumulative Square Footage (FML): 359835

FUSION WELDED SEAMS		TRIAL SEAMS		EXTRUSION WELDED SEAMS	
	Machine No.	Welder		Machine No.	Welder
AM	<u>D10</u>	<u>AK</u>	AM	_____	_____
AM	<u>W19</u>	<u>SB</u>	AM	_____	_____
	<u>D13</u>	<u>SN</u>			
PM	<u>D13</u>	<u>SN</u>	PM	_____	_____
PM	<u>D10</u>	<u>AK</u>	PM	_____	_____
	<u>W19</u>	<u>SB</u>			

Trial Seam Comments: See FML Table 2

Total Length of Seam (ft) 5692/16067

Non-destructive Testing  
Air Channel ✓  
Vacuum =  
Other Methods =

Destructive Test Samples  
Identified 11/32  
Cut 6  
Field Tested 6

Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE. ROOT PICKERS. ANCHOR TRENCH BACK FILLED AT SEVERAL SPOTS TO SECURE THE GEOMEMBRANE LINER.

Report Prepared By:

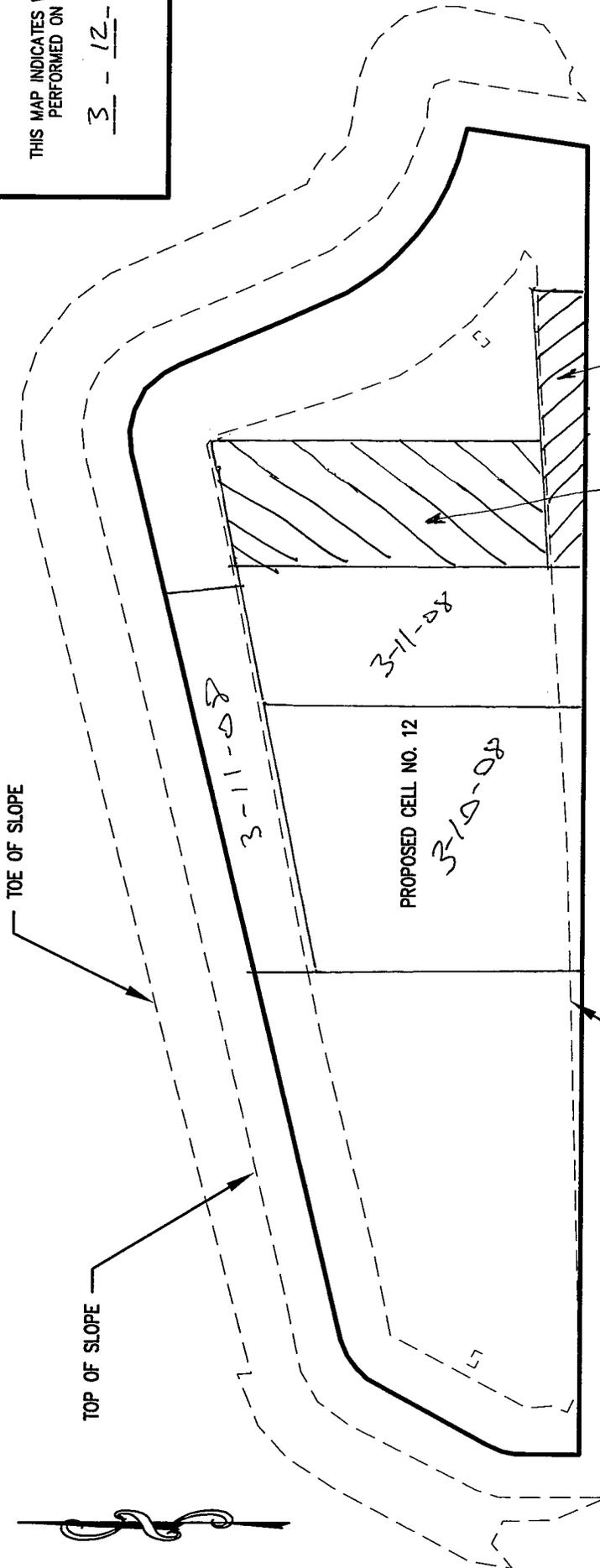
Ted Stiles

Report Reviewed By:

Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 12 - 08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

REFERENCE:

DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



DRAWN: AEH	DATE: 11-01-07	<p><b>BUNNELL-LAMMONS ENGINEERING, INC.</b>          6004 PONDERS COURT, SUITE 28615          GREENVILLE, SOUTH CAROLINA 29615          PHONE: (864)288-1265 84288-4430</p>	GEOMEMBRANE DEPLOYMENT SKETCH EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <h1>4</h1>
	CAD: ECLF58-CELL12GDS			
	APPROVED: JAG			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-13-08

PROJECT DAY NO. 130

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 9:00 PM

LUNCH BREAK: .5

WORK HOURS: 14.0

VISITORS:

NAME REPRESENTING

STEVE NICTING R.B. BAKER

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE: 43 °F  
MORNING LOW: 73 °F  
DAYTIME HIGH: 73 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION

STRUCTURAL FILL



COMPACTED CLAY LINER

LEACHATE COLLECTION



CONTRACTOR ACTIVITIES:

FINE GRADING THE CLAY LINER SURFACE AT THE EAST DRAINAGE DITCH BACKFILL.

PLASTIC FUSION FABRICATORS IS ON SITE FUSING THE 4" PERFORATED PIPE WITH CAPS.

MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.

DEPLOYMENT OF GEOMEMBRANE LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON GEOMEMBRANE LINER.

RECORD PREPARED BY:

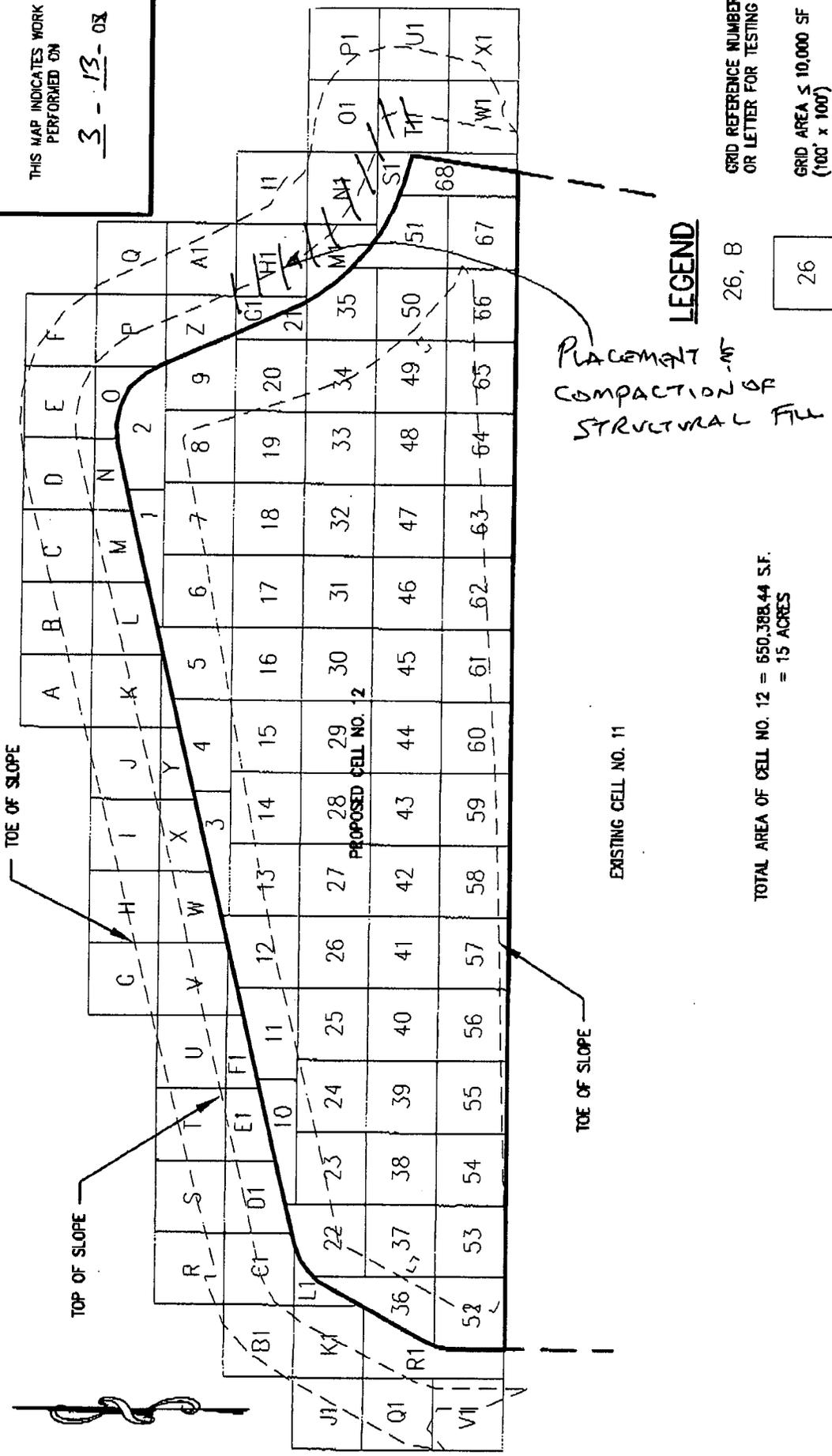
TED STILES

RECORD REVIEWED & APPROVED BY:

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3-13-08



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq 10,000$  SF (100' x 100')

Placement of  
Compaction or  
Structural Fill

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH

DATE: 11-01-07

CHECKED: JAG

CAD: EQLF58-FSC12

APPROVED:

JOB NO: J07-1001-58

**BLE**  
BUNNELL-LAMONS ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE SOUTH CAROLINA 29615  
PHONE: (864)288-1225 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIG.

1

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

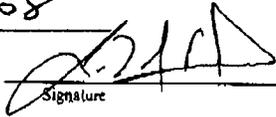
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-13-08

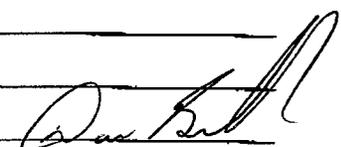
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

EXCAVATION OF CLAYEY SOILS FOR STRUCTURAL FILL  
FROM PIT #9. THE MATERIAL IS BEING PLACED IN THE  
ACCESS ROAD EAST OF THE CELL.

Reviewed: 

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-57

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-13-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY  
Temperature:  
Daytime high 73  
Morning/Evening low 43

BLE Personnel: Ted Stiles  
Allen Smith

Visitors: STEVE NICHOLS R.B. BAKER

Site Activities: DEPLOYMENT OF SMOOTH AND TEXTURED GEOMEMBRANE LINER.

Panels Deployed: from T-40 to T-70  
S-54 S-56

Total Square Footage (FML): 82534  
Cumulative Square Footage (FML): 442369

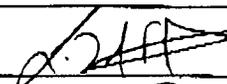
TRIAL SEAMS				
FUSION WELDED SEAMS			EXTRUSION WELDED SEAMS	
	Machine No.	Welder		Welder
AM	<u>W19</u>	<u>SB</u>	AM	_____
AM	<u>D13</u>	<u>SN</u>	AM	_____
	<u>D10</u>	<u>AK</u>		_____
PM	<u>D10</u>	<u>AK</u>	PM	_____
PM	<u>W19</u>	<u>SB</u>	PM	_____
	<u>D13</u>	<u>SN</u>		_____
Trial Seam Comments: <u>See FML Table 2</u>				

Total Length of Seam (lf) 3982/20049

Non-destructive Testing  
Air Channel ✓  
Vacuum —  
Other Methods —

Destructive Test Samples  
Identified 8/40  
Cut —  
Field Tested —

Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.

Report Prepared By: Ted Stiles 

Report Reviewed By: Daniel B. Bunnell, P. E. 

THIS MAP INDICATES WORK PERFORMED ON

3-13-08

TEXTURED  
GEOMEMBRANE  
LINER

SMOOTH  
GEOMEMBRANE  
LINER

TOE OF SLOPE

TOP OF SLOPE

3-12-08

3-1-08

3-11-08

PROPOSED CELL NO. 12

3-10-08

3-12-08

EXISTING CELL NO. 11

**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07
DRWN:	AEH
CAD:	ECLF58-CELL12GDS
CHECKED:	JAG
JOB NO.:	J07-1001-58
FIGURE:	4

**IBL** INC.  
RUSSELL-LAMARINE ENGINEERING, INC.  
6004 POWERS COURT, 29915  
GREENVILLE, SOUTH CAROLINA  
PHONE: (864) 258-1255 FAX: (864) 258-4430

GEOMEMBRANE DEPLOYMENT SKETCH  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-14-08

PROJECT DAY NO. 131

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 9:30 PM

LUNCH BREAK: 1.5

WORK HOURS: 14.5

ONSITE BLE PERSONNEL: TED STILES

VISITORS:

NAME REPRESENTING

RAY HOFFMAN, P.E. REPUBLIC

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 52 °F  
DAYTIME HIGH: 77 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PLASTIC FUSION FABRICATORS IS ON SITE FUSING THE 4"  
PERFORATED PIPE WITH CAPS.  
R.B. BAKER HAS SET A HYDRAULIC 6" PUMP IN THE 12B  
SUMP.  
MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.  
DEPLOYMENT OF GEMMEMBRANE LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

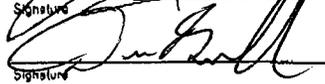
PERFORMED CGA ON GEMMEMBRANE DEPLOYMENT.

RECORD PREPARED BY:

  
Signature

TED STILES

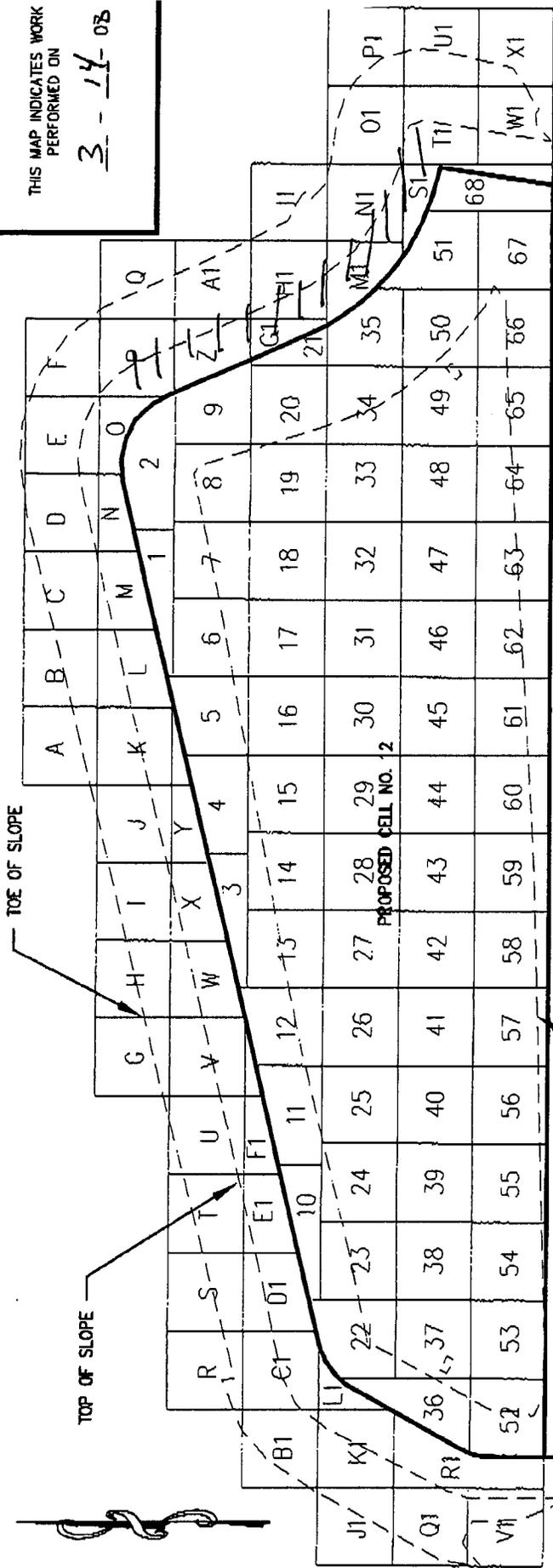
RECORD REVIEWED & APPROVED BY:

  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 14 - 08



PLACEMENT OF  
COMPACTION OF  
STRUCTURAL FILL

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIG:	1		
FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA			
DATE:	11-01-07		
CAD:	ECF58-FSCCELL12		
JOB NO:	J07-1001-58		
DRAWN:	AEH		
CHECKED:	JAG		
APPROVED:			

**BLE**  
BUNNELL-LAMMONS ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: (864)288-4430

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

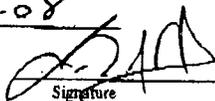
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-14-08

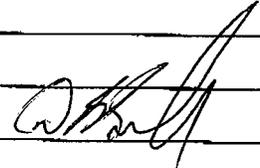
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

EXCAVATION OF CLAYEY SOILS FOR STRUCTURAL FILL FROM  
PIT #9. THE MATERIAL HAS BEEN PLACED IN THE ACCESS  
ROAD EAST OF THE CELL.

Reviewed: 

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1901-59

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-14-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions: Weather: P. CLOUDY / WINDY (STRONG)  
Temperature: Daytime high 77  
Morning/Evening low 52

BLE Personnel: Ted Stiles  
Allen Smith

Visitors: RAY HOFFMAN, PE. REPUBLIC

Site Activities: DEPLOYMENT OF SMOOTH AND TEXTURED GEOMEMBRANE LINER. THE EAST END HAS BEEN BLACKED OUT UTILIZING ONE ROLL OF AGG TEXTURED (151113) AND SMOOTH MATERIAL ON THE SLOPE. THE SMOOTH MATERIAL WILL BE REMOVED, WHEN TEXTURED IS AVAILABLE.

Panels Deployed: from T-71 to T-86 Total Square Footage (FML): 35,196  
S-57 S-60 Cumulative Square Footage (FML): 477,565

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
	Machine No.	Welder	
AM	<u>D13</u>	<u>SN</u>	AM <u>G 29</u>
AM	<u>W19</u>	<u>SB</u>	AM _____
	<u>D10</u>	<u>AK</u>	
PM	<u>D10</u>	<u>AK</u>	PM <u>G 29</u>
PM	<u>W19</u>	<u>TS</u>	PM _____
	<u>D13</u>	<u>SN</u>	
Trial Seam Comments: <u>See FML Table 2</u>			

Total Length of Seam (lf) 2544 / 22,593

Non-destructive Testing  
Air Channel ✓  
Vacuum -  
Other Methods -

Destructive Test Samples  
Identified 5 / 45  
Cut -  
Field Tested -

Additional Comments: CETCO BELTOMAT HAS BEEN PLACED IN THE 12B SUMP. PERFORMED REPAIRS AT THE EAST END. ANCHOR TRENCH BACKFILLED. MAINTENANCE AND PREPARATION OF CLAY LINER SURFACE ON THE WEST END.

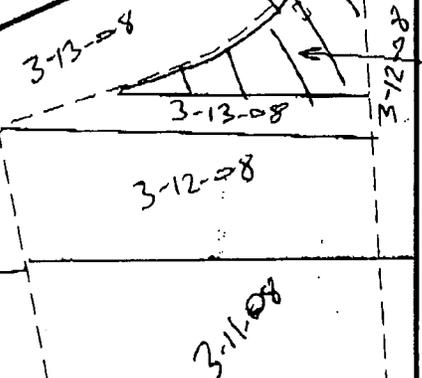
Report Prepared By: Ted Stiles  
Report Reviewed By: Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

3-14-08

TOE OF SLOPE

TOP OF SLOPE



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

<p><b>IBLB</b> INC.  <b>BURDELL-LAMMONS ENGINEERING, INC.</b>          604 POWERS COURT          GREENVILLE SOUTH, VA 22615          PHONE: (864)288-1285</p>		<p>GEOMEMBRANE DEPLOYMENT SKETCH          EAST CAROLINA LANDFILL          BERTIE COUNTY, NORTH CAROLINA</p>	<p>FIGURE  <b>4</b></p>
<p>NAME: AEH</p>	<p>DATE: 11-01-07</p>		
<p>DRAWN BY: JAG</p>	<p>CAD: ECLF58-CELL1200S</p>		
<p>APPROVED:</p>	<p>JOB NO: J07-1001-58</p>		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-68

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-15-08

PROJECT DAY NO. 132

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 9:30 PM

LUNCH BREAK: .5

WORK HOURS: 14.5

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: AM SUNNY PM CLOUDY RAIN WINDY

TEMPERATURE:  
MORNING LOW: 55 °F  
DAYTIME HIGH: 70 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
PLASTIC FUSION FABRICATORS IS ON SITE. THEY HAVE COMPLETED  
THE 4" PERFORATED PIPE AND THE 8" X 4" CROSSES AND TEES.  
PERFORMING REPAIRS ON THE DEPLOYED GEOMEMBRANE LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE LINER.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

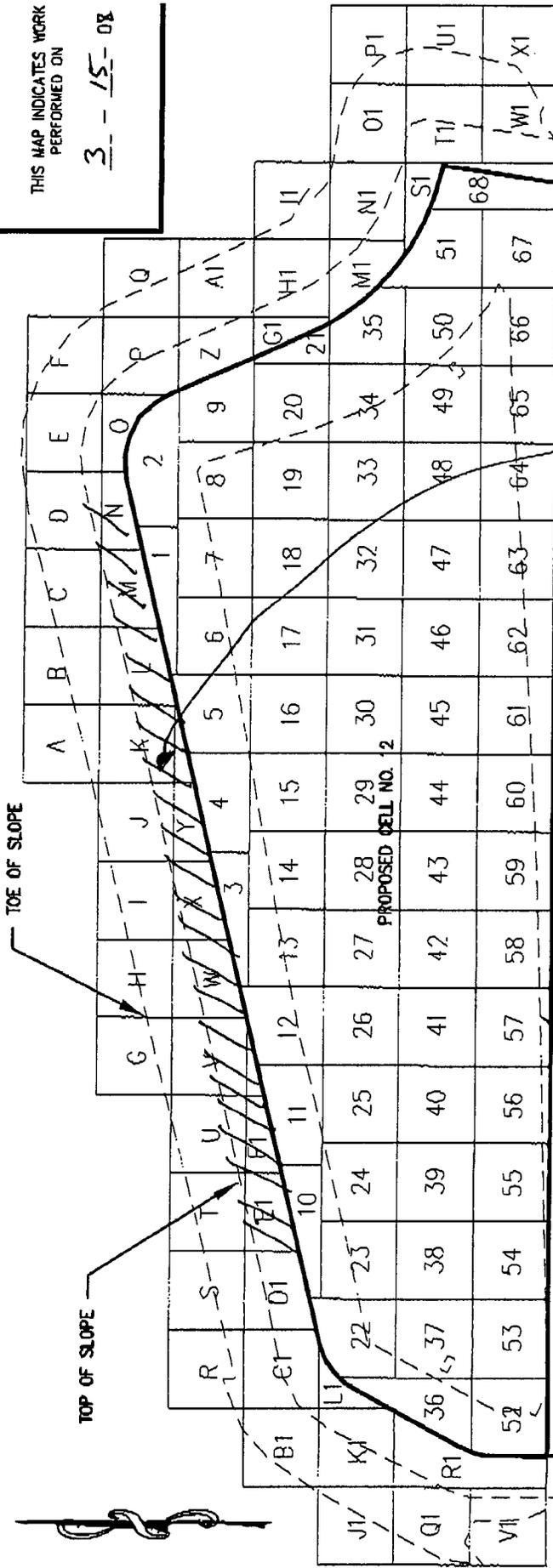
RECORD REVIEWED & APPROVED BY:

Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3-15-08



PLACEMENT & COMPACTION OF STRUCTURAL F.F.

EXISTING CELL NO. 11

**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIG. 1
	CAD: ECUFS8-FSC112	
	JOB NO: J07-1001-58	
CHECKED: JAG	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
APPROVED:	 <b>IBLE INC.</b> BUNNELL-LAMBSONS ENGINEERING, INC. 4004 PONDERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)288-1265 FAX: (864)288-4430	

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-15-08

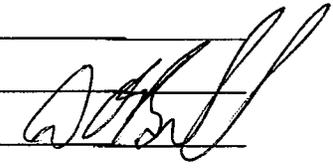
PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

EXCAVATION OF CLAYEY SPILLS FOR STRUCTURAL FILL FROM  
PIT #9. THE MATERIAL HAS BEEN PLACED IN THE ACCESS  
ROAD NORTH OF THE CELL.

Reviewed: 

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-15-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: AM SUNNY / PM CLOUDY

Temperature:  
Daytime high 70  
Morning/Evening low 55

BLE Personnel: Ted Stiles  
Allen Smith  
\_\_\_\_\_  
\_\_\_\_\_

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: PERFORMED REPAIRS ON THE GEOMEMBRANE LINER. BEGAN SEAM ON CELL 11 TIE-IN. LIGHT RAINFALL AT 3:30 HAS HALTED REPAIRS AND SEAMING. PERFORMED CLEANUP IN AND AROUND THE CELL.

Panels Deployed: from 1 to 1

Total Square Footage (FML): \_\_\_\_\_  
Cumulative Square Footage (FML): 477,565

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
Machine No.	Welder	Machine No.	Welder
AM <u>D10</u>	<u>SN</u>	AM <u>G29</u>	<u>SN</u>
AM _____	_____	AM <u>G8</u>	<u>PI</u>
		<u>G34</u>	<u>SB/ST</u>
PM <u>D10</u>	<u>SN</u>	PM <u>G8</u>	<u>PI</u>
PM _____	_____	PM <u>G29</u>	<u>SB</u>

Trial Seam Comments: See FML Table 2

Total Length of Seam (lf) 1

Non-destructive Testing  
Air Channel ✓  
Vacuum -  
Other Methods -

Destructive Test Samples  
Identified -  
Cut 39  
Field Tested 36

Additional Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Report Prepared By: Ted Stiles

Report Reviewed By: Daniel B. Bunnell, P. E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-16-08

PROJECT DAY NO. 133

ARRIVAL TIME: - AM

DEPARTURE TIME: - PM

LUNCH BREAK: /

WORK HOURS: /

ONSITE PERSONNEL: TED STILES

VISITORS:  
NAME REPRESENTING

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY

TEMPERATURE:  
MORNING LOW: 51 °F  
DAYTIME HIGH: 69 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL MEASURED AT 0.8".  
NO CONSTRUCTION ACTIVITY  
NO GEOMEMBRANE LINER ACTIVITY

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

CONFIRMED RAINFALL TOTAL AND SITE ACTIVITY, WITH TIMMY LEE, VIA PHONE.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-17-08

PROJECT DAY NO. 134

ARRIVAL TIME: 6:30 AM

DEPARTURE TIME: 10:00 PM

LUNCH BREAK: .5

WORK HOURS: 15.0

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES \_\_\_\_\_  
STANLEY PAUL \_\_\_\_\_

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 36 °F  
DAYTIME HIGH: 57 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF TOPSOIL ON THE EXTERIOR SLOPE OF THE ACCESS ROAD.

PLASTIC FUSION FABRICATORS IS ON SITE WELDING THE FORCE MAIN PIPE.

MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE AT THE WEST END.

PERFORMED REPAIRS TO THE GEOMEMBRANE LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE LINER.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 2-18-08  
ARRIVAL TIME: 6:30 AM  
DEPARTURE TIME: 8:00 PM  
LUNCH BREAK: .5  
WORK HOURS: 13.0

PROJECT DAY NO. 135

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 30 °F  
DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF TOPSOIL ON THE EXTERIOR SLOPE OF THE ACCESS ROAD,  
MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.  
PLASTIC FUSION FABRICATORS IS ON SITE WELDING THE 6" AND 10"  
SOLID PIPE FOR THE FORCE MAIN.  
TOMMY FIELDS HAS PERFORMED THE AS-BUILT ON THE DEPLOYED GEOMEMBRANE  
LINER (EAST END OF CELL)  
RECEIVING # 57 STONE. THE MATERIAL IS BEING STOCKPILED WEST  
OF CELL 10 AND 11.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE LINER ACTIVITY.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RECORD PREPARED BY:

  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature

DANIEL B. BUNNELL, P.E.

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-18-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: CLOUDY

Temperature:  
Daytime high 66  
Morning/Evening low 30

BLE Personnel: Ted Stiles  
Allen Smith  
STANLEY RAWL  
BY MARTIN

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: PERFORMED REPAIRS AND VACUUM BOX TESTING. PLACEMENT OF APPROXIMATELY 227,000 S.F. OF 8'02 GEOTEXTILE.

Panels Deployed: from 1 to 1

Total Square Footage (FML): \_\_\_\_\_  
Cumulative Square Footage (FML): 477,565

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
Machine No.	Welder	Machine No.	Welder
AM	_____	AM	_____
AM	_____	AM	_____
PM	<u>G29</u>	PM	<u>G29</u>
PM	_____	PM	<u>SB</u>
			<u>SB</u>

Trial Seam Comments: See FML Table 2

Total Length of Seam (lf) 23,559

Non-destructive Testing  
Air Channel ✓  
Vacuum ✓  
Other Methods \_\_\_\_\_

Destructive Test Samples  
Identified \_\_\_\_\_  
Cut 2/48  
Field Tested 2/48

Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE.

Report Prepared By: Ted Stiles

Report Reviewed By: Daniel B. Bunnell, P. E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-19-08

PROJECT DAY NO. 136

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 7:30 PM

LUNCH BREAK: .5

WORK HOURS: 12.0

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY  
PTLY CLOUDY

CLOUDY  
RAIN WINDY 40 MPH  
GUSTS

TEMPERATURE:

MORNING LOW: 57 °F

DAYTIME HIGH: 78 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

MAINTENANCE AND REPAIR OF CLAY LINER SURFACE.  
ROOT PICKERS WORKING THE CLAY LINER SURFACE.  
PLACEMENT OF THE 24 OZ. GEOTEXTILE CURTAIN AT THE NORTH LEACHATE  
LINE. THE 8" PERFORATED PIPE HAS BEEN SET IN PLACE. THE 4" PERFORATED  
PIPE HAS BEEN WRAPPED WITH THE 6 OZ GEOTEXTILE AND CONNECTED TO  
THE 8" PERFORATED PIPE.  
#57 AND #79 STONE HAS BEEN PLACED AT ONE LOCATION TO CONSTRUCT  
A CROSSOVER. SCRAP GEOMEMBRANE HAS BEEN PLACED ABOVE THE STONE

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON GEOMEMBRANE DEPLOYMENT.  
MONITORED PLACEMENT OF 8" PERFORATED PIPE.  
MONITORED PLACEMENT OF 4" PERFORATED PIPE AND PLACEMENT OF  
THE 6 OZ. WRAP.  
MONITORED PLACEMENT OF DRAINAGE STONE AND CONSTRUCTION  
OF THE CROSSOVER.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-19-08

PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

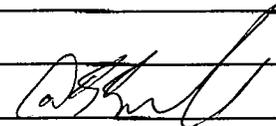
CONTRACTOR ACTIVITIES:

AND THE CROSSOVER CONSTRUCTED WITH PROTECTIVE COVER MATERIAL.

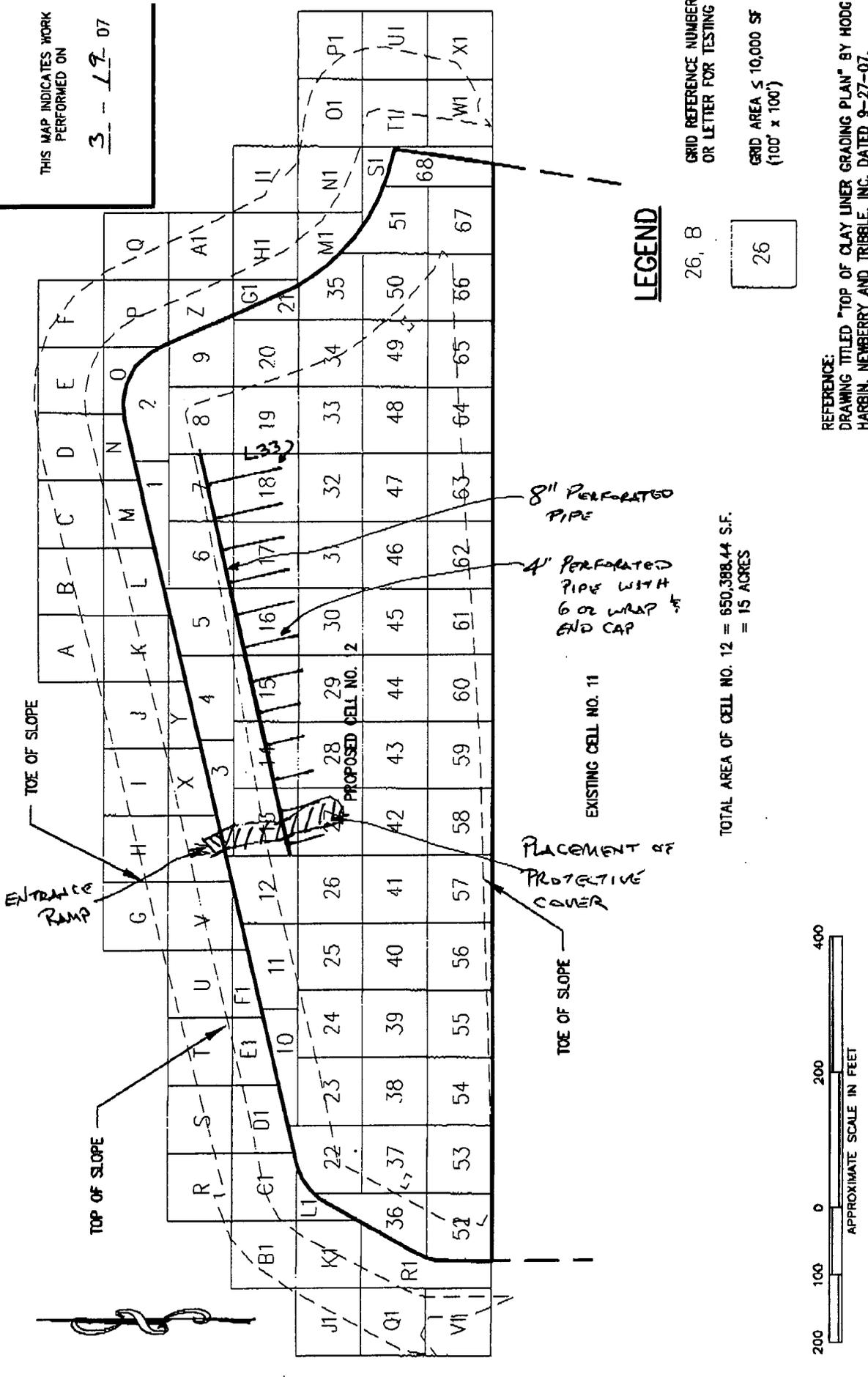
PLACEMENT OF PROTECTIVE COVER MATERIAL IN THE APPROVED AREAS.

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF PROTECTIVE COVER MATERIAL.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON  
3 - 19 - 07



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	<b>IBL</b> <b>BUNNELL-LARSON ENGINEERING, INC.</b> 6004 POWERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)288-1265 FAX: (864)288-4430	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIG
CHECKED: JAG	CAD: ECLF58-FSC112			1
APPROVED:	JOB NO: J07-1001-58			

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-19-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: CLOUDY / WINDY  
GUSTS TO 40 MPH.  
Temperature:  
Daytime high 78  
Morning/Evening low 57

BLE Personnel: Ted Stiles  
Allen Smith  
STANLEY RAWL  
JAY MARTIN

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: DEPLOYMENT OF SMOOTH GEO MEMBRANE LINER. WIND GUSTS OF 40 MPH AND SUSTAINED WINDS OF 20 MPH HAS HALT DEPLOYMENT. PERFORMED REPAIRS ON THE CELL 11 TIE IN.

Panels Deployed: from S61 to S67

Total Square Footage (FML): \_\_\_\_\_  
Cumulative Square Footage (FML): \_\_\_\_\_

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
	Machine No.	Welder	
AM	<u>D13</u>	<u>SN</u>	AM
AM	<u>D10</u>	<u>AK</u>	AM
PM	<u>D10</u>	<u>AK</u>	PM
PM	_____	_____	PM
			AM
			AM
			PM
			PM
Trial Seam Comments: <u>See FML Table 2</u>			

Total Length of Seam (lf) 1665 / 25224

Non-destructive Testing  
Air Channel ✓  
Vacuum ✓  
Other Methods -

Destructive Test Samples  
Identified 3 / 51  
Cut -  
Field Tested -

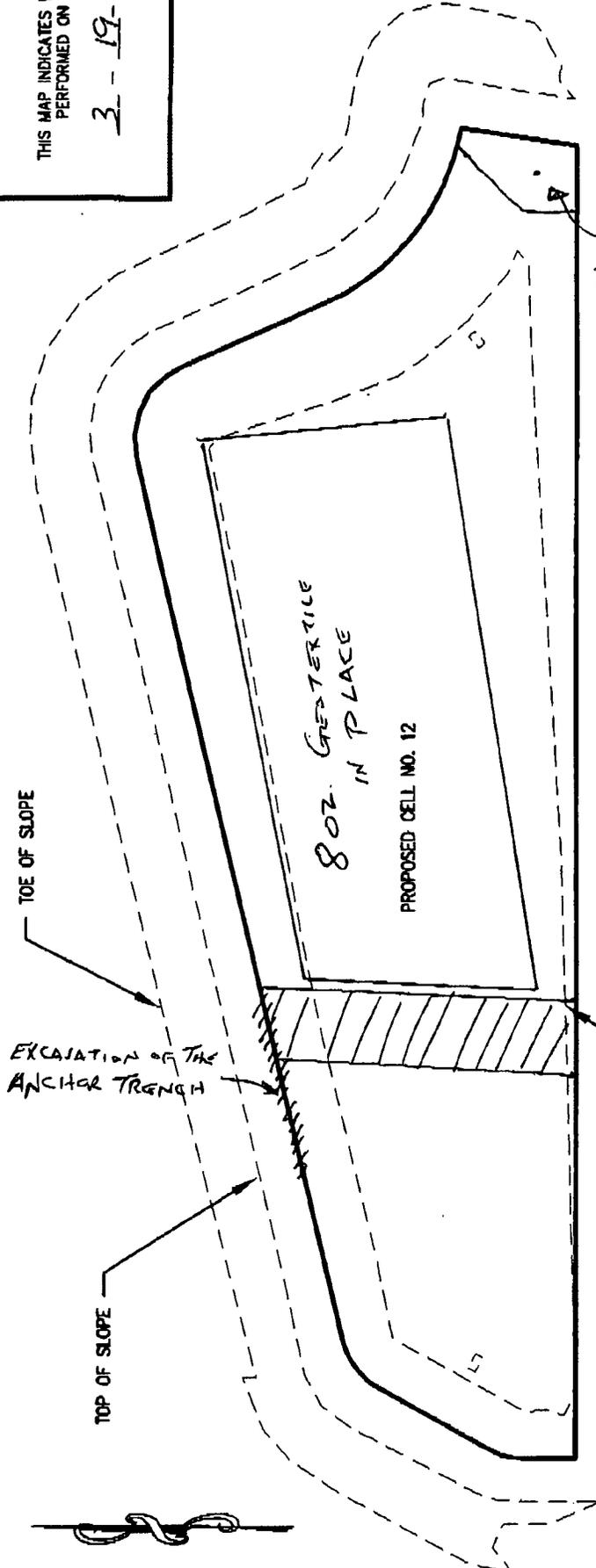
Additional Comments: MAINTENANCE AND PREPARATION OF THE CLAY LINER SURFACE. EXCAVATION OF THE ANCHOR TRENCH.

Report Prepared By: Ted Stiles

Report Reviewed By: Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

3-19-08



SMOOTH  
GEOMEMBRANE  
LINER  
TEMPORARILY  
IN PLACE

**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

NAME: AEH		DATE: 11-01-07	<b>IBL</b> BURNELL-LAMARSONS ENGINEERING, INC. 8004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (803)288-1285 (843)288-4430	FIGURE	<b>4</b>
DESIGNED BY: JAG		CAD: ECLF58-CELL12GDS		GEOMEMBRANE DEPLOYMENT SKETCH EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
APPROVED BY:		JOB NO: J07-1001-58			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-56

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-20-08

PROJECT DAY NO. 137

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 7:30 PM

LUNCH BREAK: 1.0

WORK HOURS: 11.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

STEVE NICHOLING

WEATHER:  SUNNY  CLOUDY  WINDY  
 PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 64 °F  
DAYTIME HIGH: ↓ °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 0.3".  
BLADDER HAUL ROAD TO TRIPP PROPERTY BORROW AREA.  
PLACEMENT OF PROTECTIVE COVER MATERIAL.  
THERE WAS NO ACTIVITY WITH THE GEOMEMBRANE LINER TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

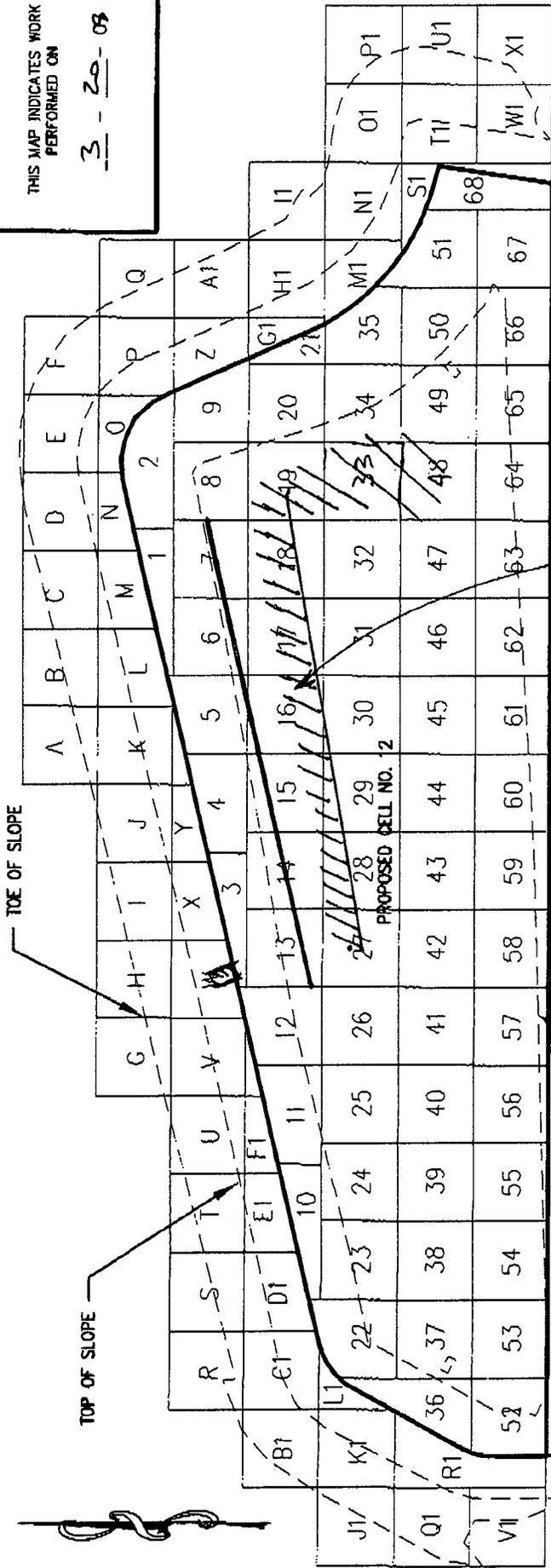
MONITORED PLACEMENT OF PROTECTIVE COVER MATERIAL.  
CRA/CONTRACTOR MEETING: BILL COOKSEY HAS INFORMED R.B. BAKER THAT  
THE MAJORITY OF THE DRAINAGE STONE SHOULD BE ON SITE BY 3/28/08.  
THE 8" X 8" CROSS FOR THE INTERSECTION OF THE NORTH LEACHATE LINE AND  
THE EAST TIE DRAIN IS NOT ON SITE YET.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL P.E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 20 - 09



**LEGEND**

26, B  
 GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

EXISTING CELL NO. 11



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGI HARBIN, NEMBERTY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	EGLFSB-FSCCELL12
APPROVED:		JOB NO:	107-1001-58

**IBL**  
 BUNNELL-LAMBSON ENGINEERING, INC.  
 9004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)268-1285 FAX: (864)268-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIG 1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-21-08

PROJECT DAY NO. 138

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 9:30 PM

LUNCH BREAK: 5

WORK HOURS: 14.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER:  SUNNY  CLOUDY  WINDY  
 PITY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 34 °F  
DAYTIME HIGH: 67 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER.  
PLACEMENT OF THE NORTHERN LENGTHS, PREWELDED  
TO THE REQUIRED LENGTH WITH CAPS, OF THE SOUTHERN LEACHATE  
LINE WHERE THE 8oz GEOTEXTILE IS IN PLACE.  
PLACEMENT AND COMPACTION OF CLAY LINER MATERIAL  
IN THE WEST DRAINAGE DITCH BACKFILL. THE SUMP AND  
FILL AREA HAS BEEN GRADED AND PREPARED FOR GEOMEMBRANE.  
PLACEMENT OF GEOMEMBRANE LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE LINER.  
MONITORED PLACEMENT OF THE 4" PERFORATED PIPE.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

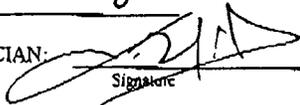
RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-21-58

PAGE 2 OF 2

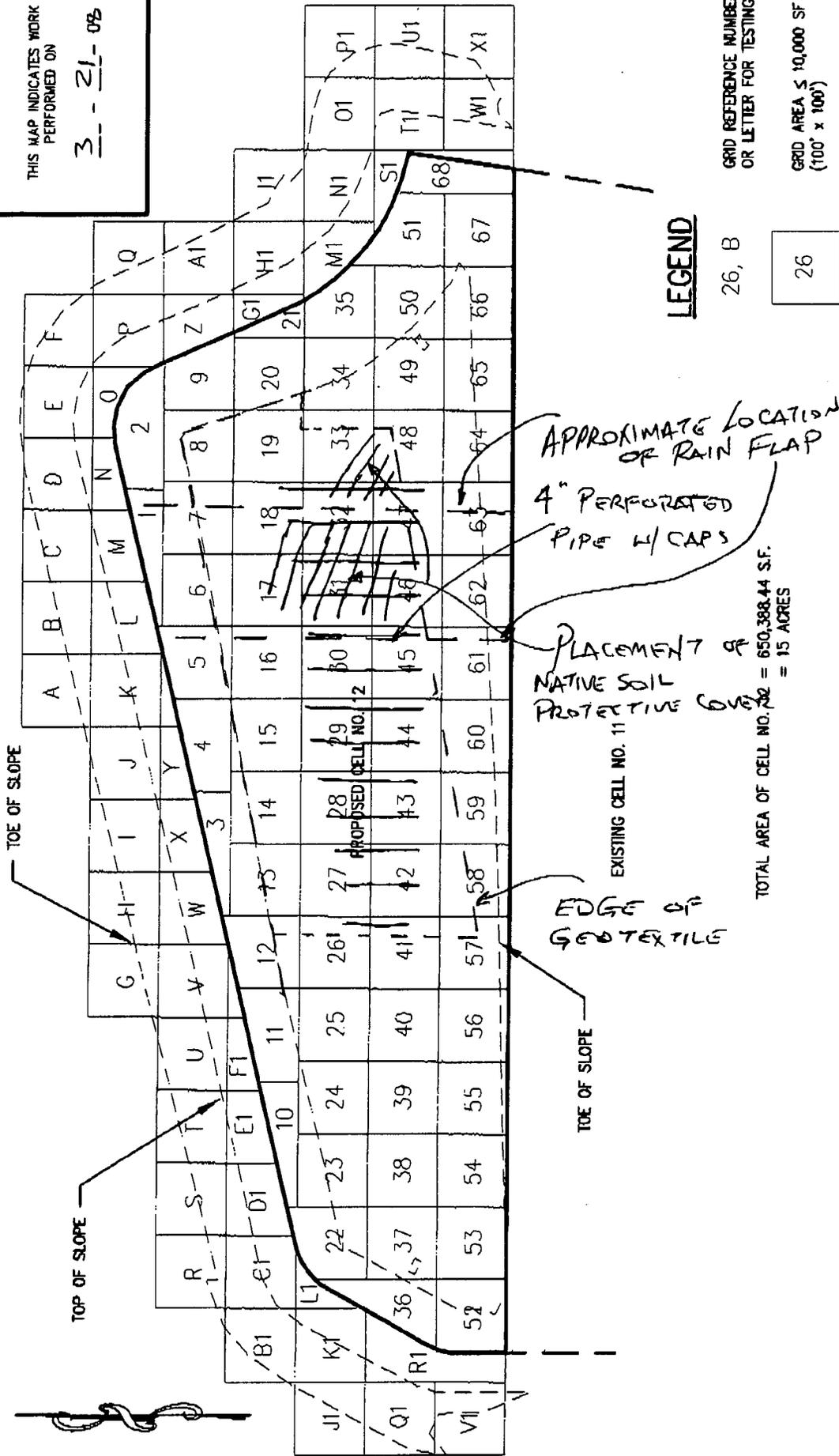
CQA TECHNICIAN:  TED STILES

EXCAVATION OF CLAYEY SOILS FOR CLAY LINER  
MATERIAL FROM PIT # 9 - THE MATERIAL WAS USED TO  
BACKFILL THE WEST DRAINAGE DITCH.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

3 - 21 - 08



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

REFERENCE:

DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HOD HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIG

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA



**BURRELL-LAMBSONS ENGINEERING, INC.**  
6004 PONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: (864)288-4430

DRAWN: AEH DATE: 11-01-07

CHECKED: JAG CAD: ECLF58-FSC0112

APPROVED: JOB NO: J07-1001-58



TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER

EXISTING CELL NO. 11

EDGE OF GEOTEXTILE

APPROXIMATE LOCATION OF RAIN FLAP

4" PERFORATED PIPE W/ CAPS

TOE OF SLOPE

TOP OF SLOPE

TOE OF SLOPE

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-21-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY

Temperature:  
Daytime high 67  
Morning/Evening low 34

BLE Personnel: Ted Stiles  
Alton Smith  
STANLEY RAWL

Visitors: \_\_\_\_\_

Site Activities: DEPLOYMENT OF THE GEOMEMBRANE LINER. THE WEST END HAS BEEN BACKFILLED OUT. THE TIE IN SEAM AT CELL FOR DEPLOYMENT ON 3/19/08 AND 3/21/08 REMAINS TO BE COMPLETED.

Panels Deployed: from S-68 to S-104  
T-87 T-90

Total Square Footage (FML): 146,993  
Cumulative Square Footage (FML): 657,844

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
	Machine No.	Welder	
AM	<u>D10</u>	<u>AK</u>	AM <u>G29</u>
AM	<u>D13</u>	<u>SN</u>	AM _____
	<u>D19</u>	<u>NJ</u>	_____
PM	<u>D10</u>	<u>AK</u>	PM <u>G29</u>
PM	<u>D13</u>	<u>SN</u>	PM _____
	<u>D19</u>	<u>NJ</u>	_____
Trial Seam Comments: <u>See FML Table 2</u>			

Total Length of Seam (lf) 6908/32,132

Non-destructive Testing  
Air Channel   
Vacuum   
Other Methods

Destructive Test Samples  
Identified 11/62  
Cut 14/62  
Field Tested 14/62

Additional Comments: PLACED AND COMPACTED BACKFILL IN THE WEST DRAINAGE DITCH. THE AREA WAS GRADED AND PREPARED FOR GEOMEMBRANE DEPLOYMENT. PLACED BACKFILL AT VARIOUS LOCATIONS TO SECURE THE GEOMEMBRANE

Report Prepared By: Ted Stiles  
Report Reviewed By: Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

3-21-08

TOE OF SLOPE

TOP OF SLOPE

PROPOSED CELL NO. 12

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF  
(100' x 100')

LEGEND

Deployment of Smooth Geomembrane (Textured Partials Used in North Corner)



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE  
**4**

GEOMEMBRANE DEPLOYMENT SKETCH  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL** inc.  
BUNNELL-LAMMONS ENGINEERING, INC.  
6004 POWERS COURT  
GREENVILLE SOUTH, NC 29615  
PHONE: (864)289-1295 FAX: (864)289-4430

TASK:	AEH	DATE:	11-01-07
DRAWN BY:	JAG	CAD:	ECLF58-CELL12.CDS
APPROVED:		JOB NO.:	J07-1001-58

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-22-08

PROJECT DAY NO. 139

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 9:00 PM

LUNCH BREAK: .5

WORK HOURS: 13.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 50 °F  
DAYTIME HIGH: 75 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF PROTECTIVE COVER MATERIAL (NATIVE SOIL).  
THE CELL HAS BEEN BLACKED OUT WITH GED MEMBRANE  
LINER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

PERFORMED CQA ON THE GEOMEMBRANE LINER.  
MONITORED PLACEMENT OF PROTECTIVE COVER MATERIAL.

RECORD PREPARED BY:

Ted Stiles  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature

DANIEL B. BUNNELL, P.E.



# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J67-1001-59

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-22-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: cloudy / windy  
Temperature:  
Daytime high 75  
Morning/Evening low 50

BLE Personnel: Ted Stiles  
Allen Smith  
STANLEY RAWL

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: REMOVED SMOOTH LINER FROM THE SOUTH EAST CORNER SLOPE. COMPLETED DEPLOYMENT OF GEOMEMBRANE LINER AND CONTAINMENT SEAMING. PERFORMED REPAIRS AND DEPLOYMENT OF GEOTEXTILE FABRIC (≈ 90,000 SF)

Panel Deployed: from T-91 to T-100      Total Square Footage (FML): 12,226  
Cumulative Square Footage (FML): 622,070

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
Machine No.	Welder	Machine No.	Welder
AM <u>D10</u>	<u>NJ</u>	AM <u>G29</u>	<u>AP</u>
AM <u>D13</u>	<u>SN</u>	AM _____	_____
<u>D19</u>	<u>AK</u>		
PM <u>D10</u>	<u>NJ</u>	PM <u>G29</u>	<u>AP</u>
PM <u>D19</u>	<u>AK</u>	PM _____	_____

Trial Seam Comments: See FML Table 2

Total Length of Seam (lf) 1477/33609

Non-destructive Testing  
Air Channel ✓  
Vacuum ✓  
Other Methods —

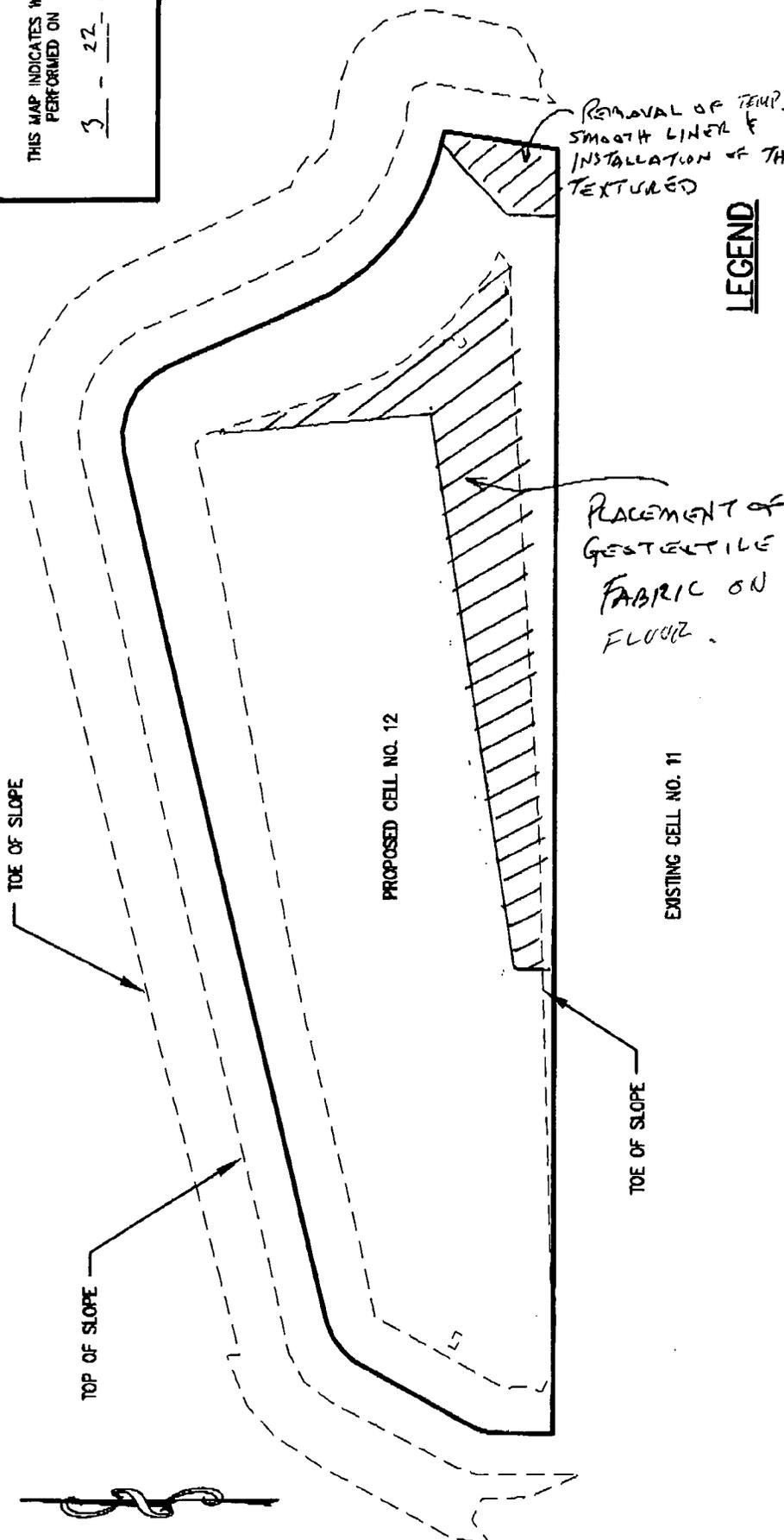
Destructive Test Samples  
Identified 4/66  
Cut 4/66  
Field Tested 4/66

Additional Comments: \_\_\_\_\_  
\_\_\_\_\_

Report Prepared By: Ted Stiles  
Report Reviewed By: Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 22 - 08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE **4**

GEOMEMBRANE DEPLOYMENT SKETCH  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL**  
BUNNELL-LANANOS ENGINEERING, INC.  
6004 POWERS COURT, #A, 28815  
GREENVILLE, SOUTH CAROLINA  
PHONE: (864)288-1265

DATE:	11-01-07
CAD:	ECLF56-CELL12GDS
JOB NO:	J07-1001-58

APPROVED: JAG

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-59

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-23-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: SUNNY  
Temperature:  
Daytime high 59  
Morning/Evening low 37

BLE Personnel: Ted Stiles  
Allen Smith  
\_\_\_\_\_  
\_\_\_\_\_

Visitors: \_\_\_\_\_  
\_\_\_\_\_

Site Activities: COMPLETION OF THE 8 OZ GEOTEXTILE FABRIC DEPLOYMENT. PERFORMED REPAIRS ON THE GEOMEMBRANE LINER. THE VACUUM BOX TESTING IS IN PROGRESS.

Panels Deployed: from \_\_\_\_\_ to \_\_\_\_\_

Total Square Footage (FML): \_\_\_\_\_  
Cumulative Square Footage (FML): 672,070

TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
Machine No.	Welder	Machine No.	Welder
AM	_____	AM	<u>G29</u>
AM	_____	AM	<u>AP</u>
PM	_____	PM	_____
PM	_____	PM	_____

Trial Seam Comments: See FML Table 2

Total Length of Seam (lf) 133609

Non-destructive Testing  
Air Channel   
Vacuum   
Other Methods

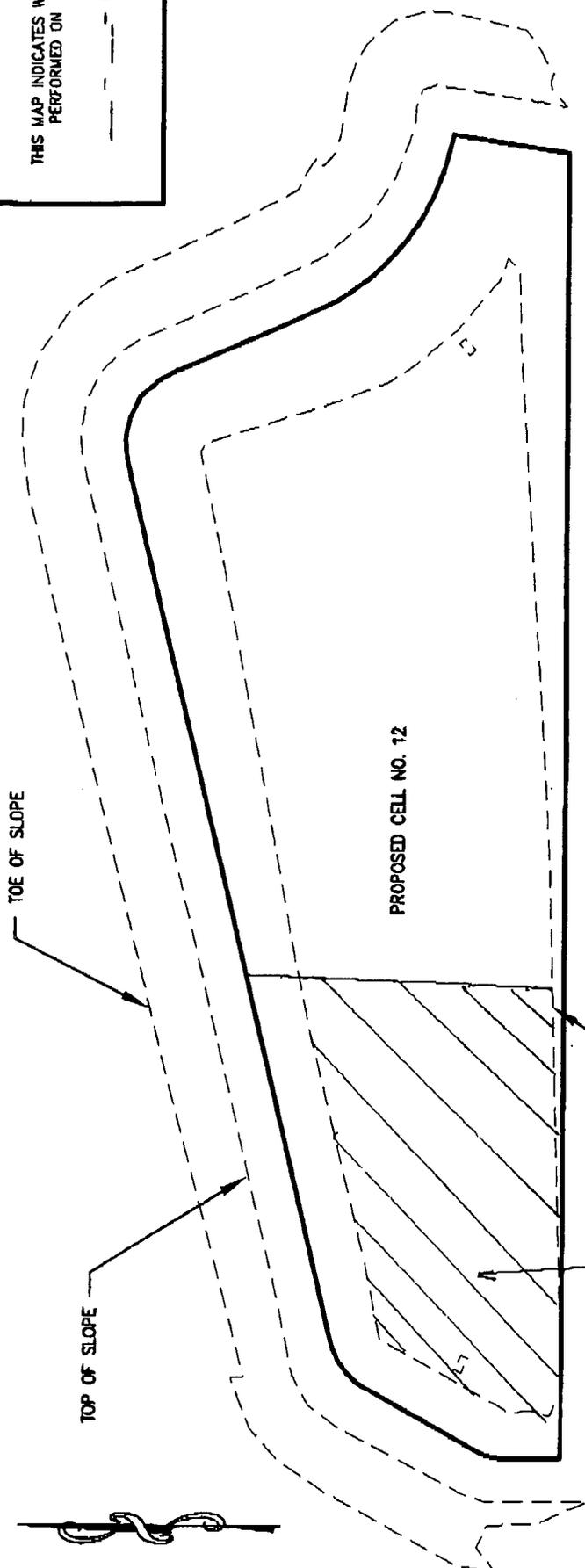
Destructive Test Samples  
Identified 2/68  
Cut 2/68  
Field Tested 2/68

Additional Comments: THE TIE IN SEAM TO CELL 11 IS 1635 L.F. (FUSION WELDED). FOUR DESTRUCTIVE SAMPLES WERE TAKEN ON THE TIE IN.

Report Prepared By: Ted Stiles  
Report Reviewed By: Daniel B. Bunnell, P. E.

THIS MAP INDICATES WORK PERFORMED ON

--- 08



Placement of the  
Bot. geotextile  
Fabric

**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq$  10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE	11-01-07	<b>IBLB</b> INC. BURNELL-PLANNING ENGINEERING, INC. 6004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)258-1253	GEOMEMBRANE DEPLOYMENT SKETCH EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE	<b>4</b>	
	HECKED:	JAG			CAD:		ECLF58-CELL12GDS
	APPROVED:				JOB NO.:		.07-1001-58

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-23-08

PROJECT DAY NO. 140

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 8:00 PM

LUNCH BREAK: .5

WORK HOURS: 12.5

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 37 °F  
DAYTIME HIGH: 59 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

THE PLACEMENT OF THE 8' OZ. GEOTEXTILE IS COMPLETE.  
PLACEMENT OF THE 24' OZ GEOTEXTILE CUSHION ON THE SOUTHERN  
LEACHATE LINE AND IN THE SUMPS.  
PLACEMENT OF THE 8" PERFORATED PIPE, WITH 4" CROSSES,  
AND THE 4" PERFORATED PIPE, WRAPPED IN 6' OZ GEOTEXTILE,  
EAST OF THE BREAK POINT OF THE SOUTHERN LINE.  
THE PUMPS HAVE BEEN SET IN THE SUMPS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF THE GEOTEXTILE.  
MONITORED PLACEMENT OF THE 8" AND 4" PERFORATED PIPE.  
PERFORMED CQA ON THE GEOMEMBRANE LINER.

RECORD PREPARED BY:

*Ted Stiles*  
Signature

TED STILES

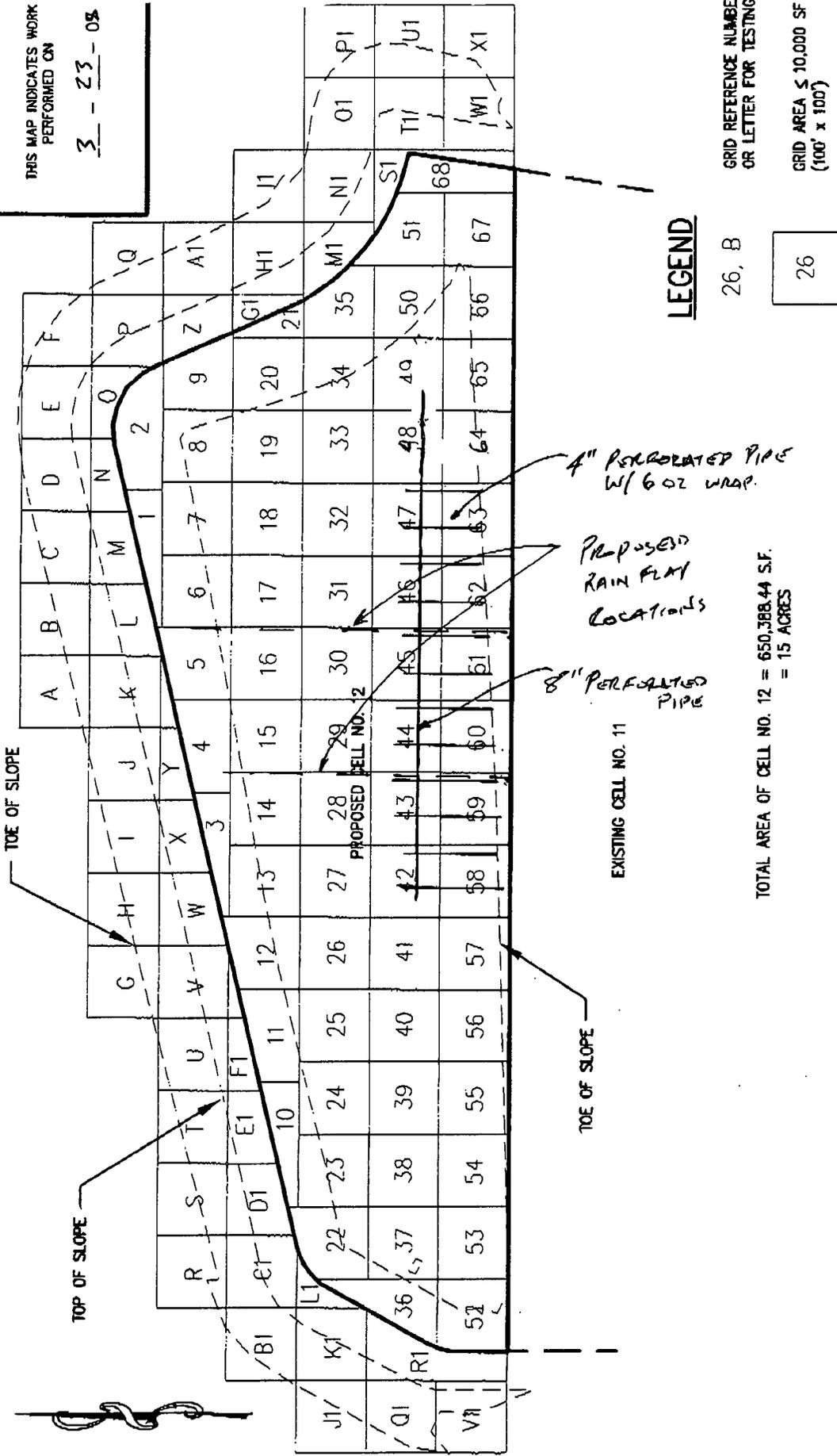
RECORD REVIEWED & APPROVED BY:

*Daniel B. Bunnell*  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 23 - 08



**LEGEND**

26, B

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26

GRID AREA  $\leq$  10,000 SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



DRAWN: AEDH	DATE: 11-01-07	<p><b>BUNNELL-LAMMONS ENGINEERING, INC.</b>          6004 POWERS COURT, 28815          GREENSBORO, SOUTH CAROLINA          PHONE: (864)358-1265 FAX: (864)358-4430</p>	<p>FIELD SKETCH - CELL NO. 12          EAST CAROLINA LANDFILL          BERTIE COUNTY, NORTH CAROLINA</p>
CHECKED: JAG	CAD: ECLF58-FSCCELL12		
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-24-08

PROJECT DAY NO. 141

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 8:00 PM

LUNCH BREAK: .5

WORK HOURS: 12.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

JAY MARTIN

STEW NICHING R.B. BAKER

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 37 °F  
DAYTIME HIGH: 59 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF THE 8" PERFORATED PIPE FOR THE EAST TOE DRAIN.  
PLACEMENT OF PROTECTIVE COVER MATERIAL (NATIVE SOILS).  
RECEIVING #57 AND #78M STONE. THE MATERIAL IS BEING  
STOCKPILED WEST OF CELLS 10/11.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF THE EAST TOE DRAIN PIPE.  
MONITORED PLACEMENT OF PROTECTIVE COVER MATERIAL.  
PERFORMED QA/QC GEOMEMBRANE LINER ACTIVITY.

RECORD PREPARED BY:



TED STILES

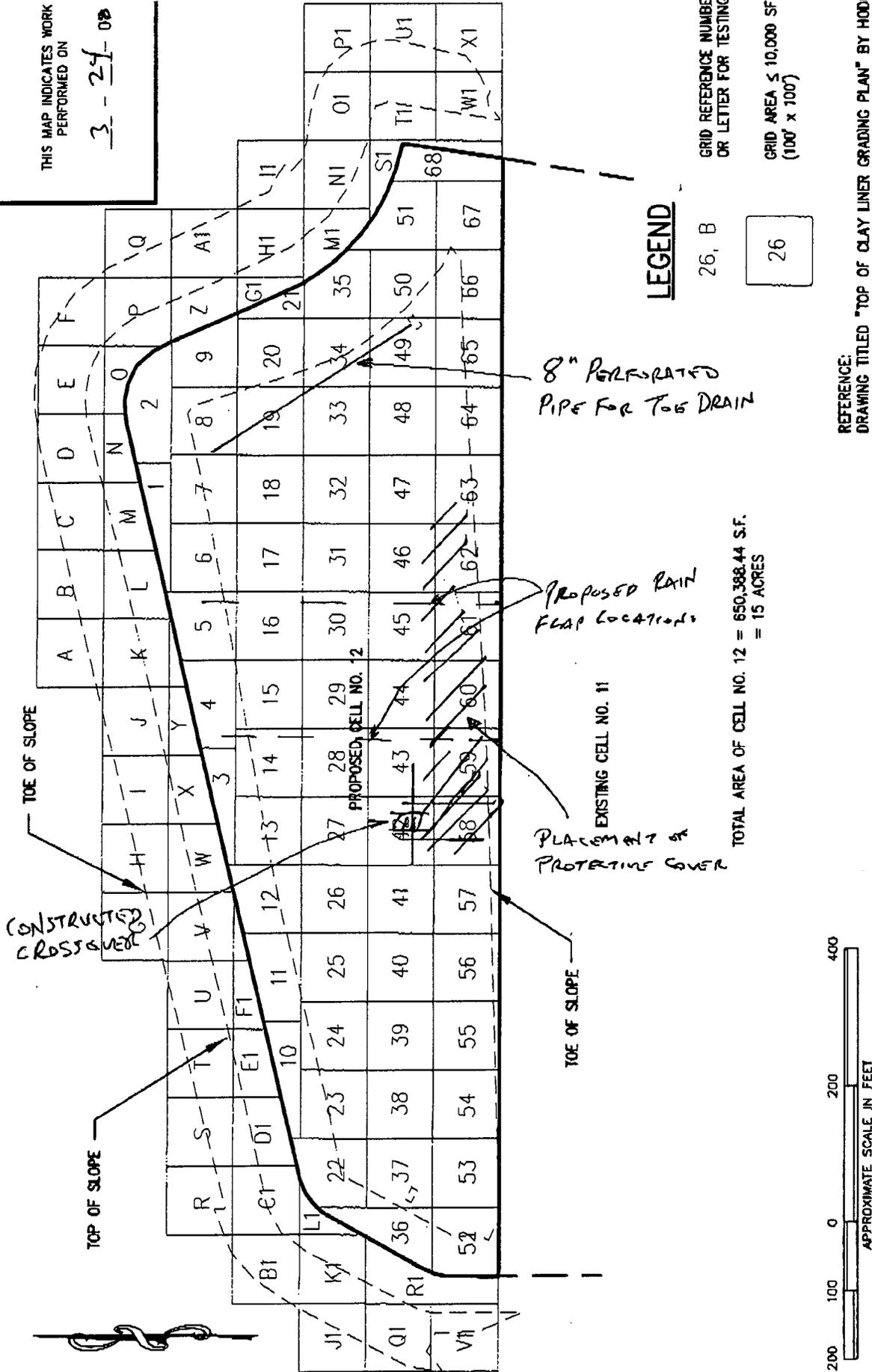
RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3-24-08



**LEGEND**

26, B

26

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



FIG	1		
FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA			
DATE	11-01-07		
CAD	ECLF58-FSC12		
JOB NO.	J07-1001-58		
DRAWN:	AEH		
CHECKED:	JAG		
APPROVED:			

**BLE** INC.  
BUNNELL-LAUBONG ENGINEERING, INC.  
6004 FONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)286-1285 FAX: (864)286-4430

# GEOMEMBRANE DAILY ACTIVITY SUMMARY

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Client: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

Date: 3-24-08

Time Out: \_\_\_\_\_  
Time In: \_\_\_\_\_  
Lunch: \_\_\_\_\_  
Total Hours: \_\_\_\_\_

Site Conditions:

Weather: CLOUDY  
Temperature:  
Daytime high 59  
Morning/Evening low 37

BLE Personnel: Ted Stiles  
Allen Smith  
JAY MARTIN

Visitors: STEVE NICHOLING

Site Activities: BEGAN EXTRUSION WELDING OF THE TWO WESTERN MOST RAIN FLAPS. PERFORMED CLEAN UP OF GEOMEMBRANE LINER DEBRIS.

Panels Deployed: from 1 to 1 Total Square Footage (FML): \_\_\_\_\_  
Cumulative Square Footage (FML): 672,070

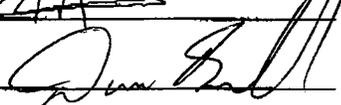
TRIAL SEAMS			
FUSION WELDED SEAMS		EXTRUSION WELDED SEAMS	
Machine No.	Welder	Machine No.	Welder
AM	_____	AM	<u>G29</u> <u>SB</u>
AM	_____	AM	<u>G8</u> <u>PI</u>
PM	_____	PM	_____
PM	_____	PM	_____
Trial Seam Comments: <u>See FML Table 2</u>			

Total Length of Seam (lf) 33609

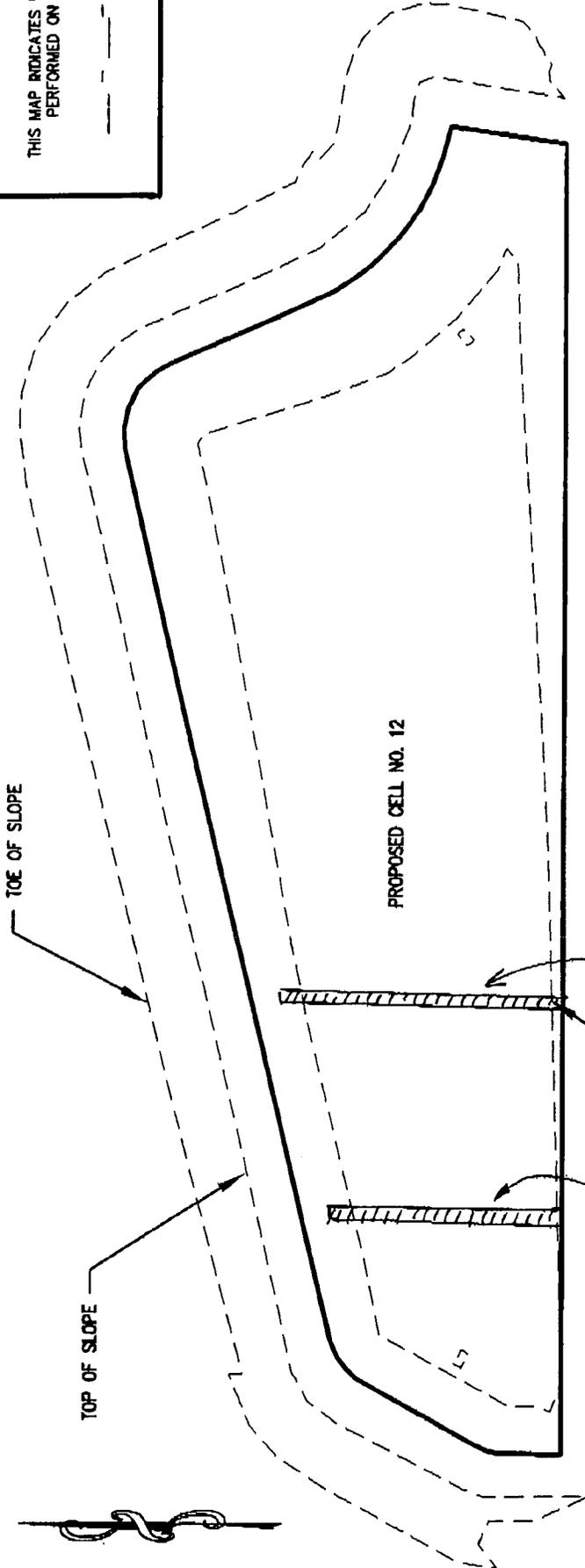
Non-destructive Testing  
Air Channel \_\_\_\_\_  
Vacuum ✓  
Other Methods \_\_\_\_\_

Destructive Test Samples  
Identified \_\_\_\_\_  
Cut \_\_\_\_\_  
Field Tested \_\_\_\_\_

Additional Comments: \_\_\_\_\_

Report Prepared By: Ted Stiles   
Report Reviewed By: Daniel B. Bunnell, P. E. 

THIS MAP INDICATES WORK  
PERFORMED ON \_\_\_\_\_ 08



**LEGEND**

GRID REFERENCE NUMBER  
OR LETTER FOR TESTING

GRID AREA  $\leq 10,000 \text{ SF}$   
( $100' \times 100'$ )

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES,  
HARGIS, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07	<b>IBL</b> INCL. <b>BURRELL-LANMON ENGINEERING, INC.</b> 6004 POWERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)288-1285 (864)288-4430	GEOMEMBRANE DEPLOYMENT SKETCH EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	<b>4</b> FIGURE
	CAD: ECLF58-CELL12GDS			
	JOB NO: J07-1001-58			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-25-08

PROJECT DAY NO. 142

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 9:30 PM

LUNCH BREAK: .5

WORK HOURS: 14.0

ONSITE BLE PERSONNEL: TED STILES

JOHN MARTIN

VISITORS:  
NAME REPRESENTING

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 37 °F  
DAYTIME HIGH: 60 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF PROTECTIVE COVER MATERIAL (NATIVE SOIL).  
PLACEMENT OF THE 24 OZ. GEOTEXTILE CUSHION AND 4" PERFORATED PIPE  
PIPE, WRAPPED IN 6 OZ GEOTEXTILE, WEST OF THE HIGH POINT.  
PLACEMENT OF THE RAIN FLAPS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

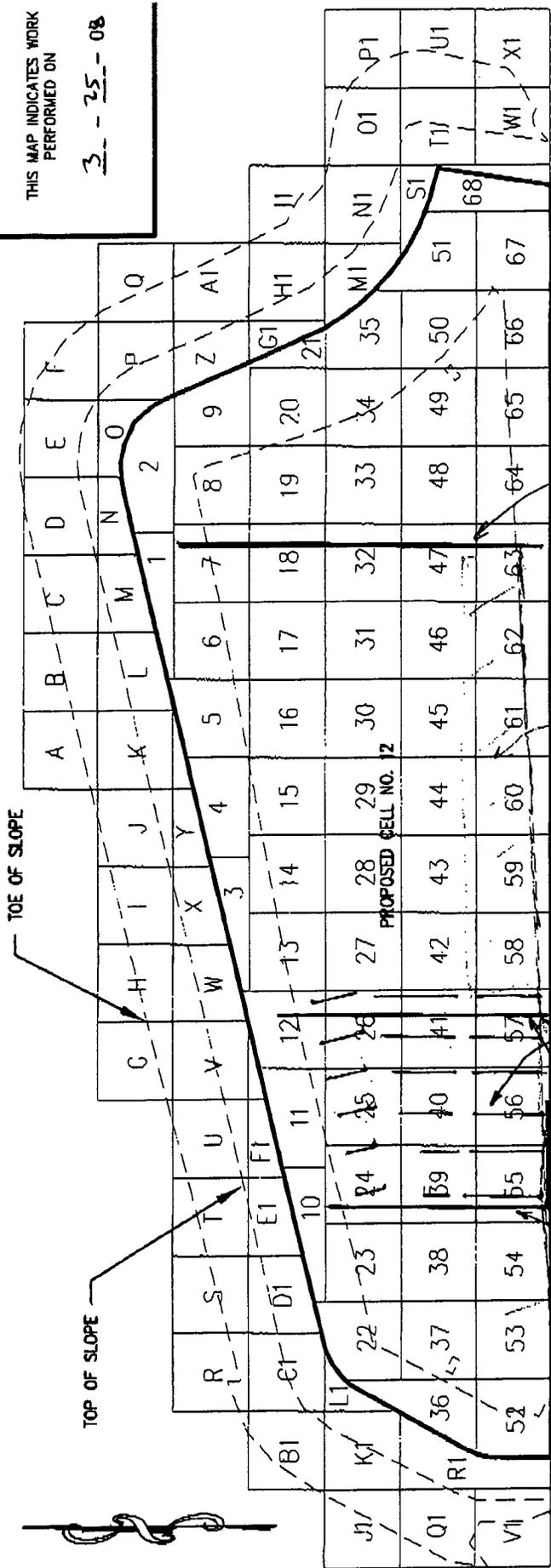
MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED PLACEMENT OF 4" PIPE.  
PERFORMED CDA ON THE RAIN FLAP INSTALLATION.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 25 - 08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG : HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIG. 1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL** INC.  
BUNNELL-JAMMONS ENGINEERING, INC.  
6004 POWERS COURT, 28815  
GREENSBORO, SOUTH CAROLINA  
PHONE (803)288-1245 FAX (803)288-1430

DRAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECLF58-FSC0112
APPROVED:		JOB NO:	J07-1001-58



THIS MAP INDICATES WORK  
PERFORMED ON

3 - 25 - 08

TOE OF SLOPE

TOP OF SLOPE

PROPOSED CELL NO. 12

EXISTING CELL NO. 11

RAIN FLAPS  
23' WIDE

RAIN FLAPS  
11.5' WIDE  
TOE OF SLOPE

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

LEGEND

GRID REFERENCE NUMBER  
OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF  
( $100' \times 100'$ )



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HOOGES,  
HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

GEOMEMBRANE DEPLOYMENT SKETCH  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**BLE** INC.  
BUNNELL-JAMMONS ENGINEERING, INC.  
8004 POWERS  
GREENVILLE SOUTH  
SOUTH CAROLINA  
PHONE: (864) 328-1263  
FAX: (864) 328-4430

DATE	11-01-07
CAD:	ECL58-CELL12GDS
JOB NO:	JD7-1001-58

DRAWN: AEH  
CHECKED: JAG  
APPROVED:

FIGURE  
**4**



**BUNNELL-LAMMONS ENGINEERING, INC.**

GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF CQA ENGINEER'S SITE VISIT**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Date of Visit:** March 26, 2008

**Site Visit by:** Daniel B. Bunnell, P.E.  
Project CQA Engineer

**Weather Conditions:** Sunny, high mid-70's

**Project Status:** Installation of Protective Cover

---

Mr. Dan Bunnell, P.E was met and accompanied at the site by the on-site CQA engineering technician, Mr. Jay Martin. The project documents and details were reviewed with Mr. Martin.

American Environmental Group, Ltd. (AEG) had completed installation of the geomembrane (FML) storm water rainflaps which completed the liner installation for Cell No. 12. AEG demobilized from the project at approximately noon.

R. B. Baker Construction Company, Inc. (Baker) was in the process of placing protective cover sand over the geotextile cushion fabric on the cell floor. The 8-inch diameter perforated HDPE pipes had been placed over the 24-oz geotextile cushion fabric. Four inch lateral leachate pipes had been connected at the designated 50-foot center to center spacing. The 4-inch perforated pipes were wrapped in 6-oz geotextile fabric. The connections between the 8-inch perforated and the 4-inch perforated lateral leachate lines were fusion welded. The initial joint of the 4-inch pipe extending away from the "T" was made utilizing a slip joint coupling, and the remaining joints in the 4-inch pipe were fusion welded.

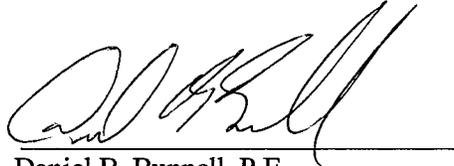
Clean fine to coarse sand, imported from the selected off-site borrow pit was being placed in the western sump as designated on the design plans. On-site native protective cover sands, excavated from the Tripp Borrow Area from the designated sand strata was being placed as protective cover away from the sump location.

Baker was utilizing one trackhoe to excavate sand from the on-site clean fine to medium sand stockpile and hauling the sand into the cell utilizing six articulated dump trucks. Sand was being initially deposited by the trucks operating over a minimum 4-foot thick haul road. The sand was being spread with a low ground pressure dozer. A trackhoe was used for sand placement in the vicinity of the 8-inch

leachate pipes. Installation of the ASTM No. 57 stone and NC DOT No. 78M stone around each of the 8-inch perforated leachate pipes had not yet been started.

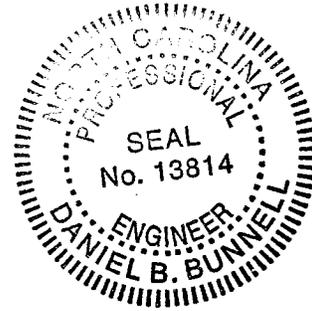
In conclusion, the placement of protective cover sand and leachate collection system was observed to be in conformance with the project Plans, Specifications and CQA Manual.

Respectively submitted by:



Daniel B. Bunnell, P.E.  
Project CQA Engineer  
Registered, NC No. 13814

4-3-08



Distribution: Bill Hodges, P.E.  
Bill Cooksey, P.E.  
Ray Hoffman, P.E.  
Steve Nichting  
Jeff Helvey, P.E.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3/26/08  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 7:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 12.0

PROJECT DAY NO. 143

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL:  
TED STILES  
JOHN MARTIN  
DAN BUNNELL, P.E.

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 43 °F  
DAYTIME HIGH: 77 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF PROTECTIVE COVER (NATIVE MATERIAL)  
PLACEMENT OF SAND AROUND SUMP AREA ON WEST SIDE (10' SAND)  
PLACEMENT OF RAIN FLAPS & CLEAN UP. (AEG)  
PLACEMENT OF 8" LEACHATE PIPE ON WEST SIDE OF CELL  
AEG HAS COMPLETED THE GEOMEMBRANE LINER INSTALLATION.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

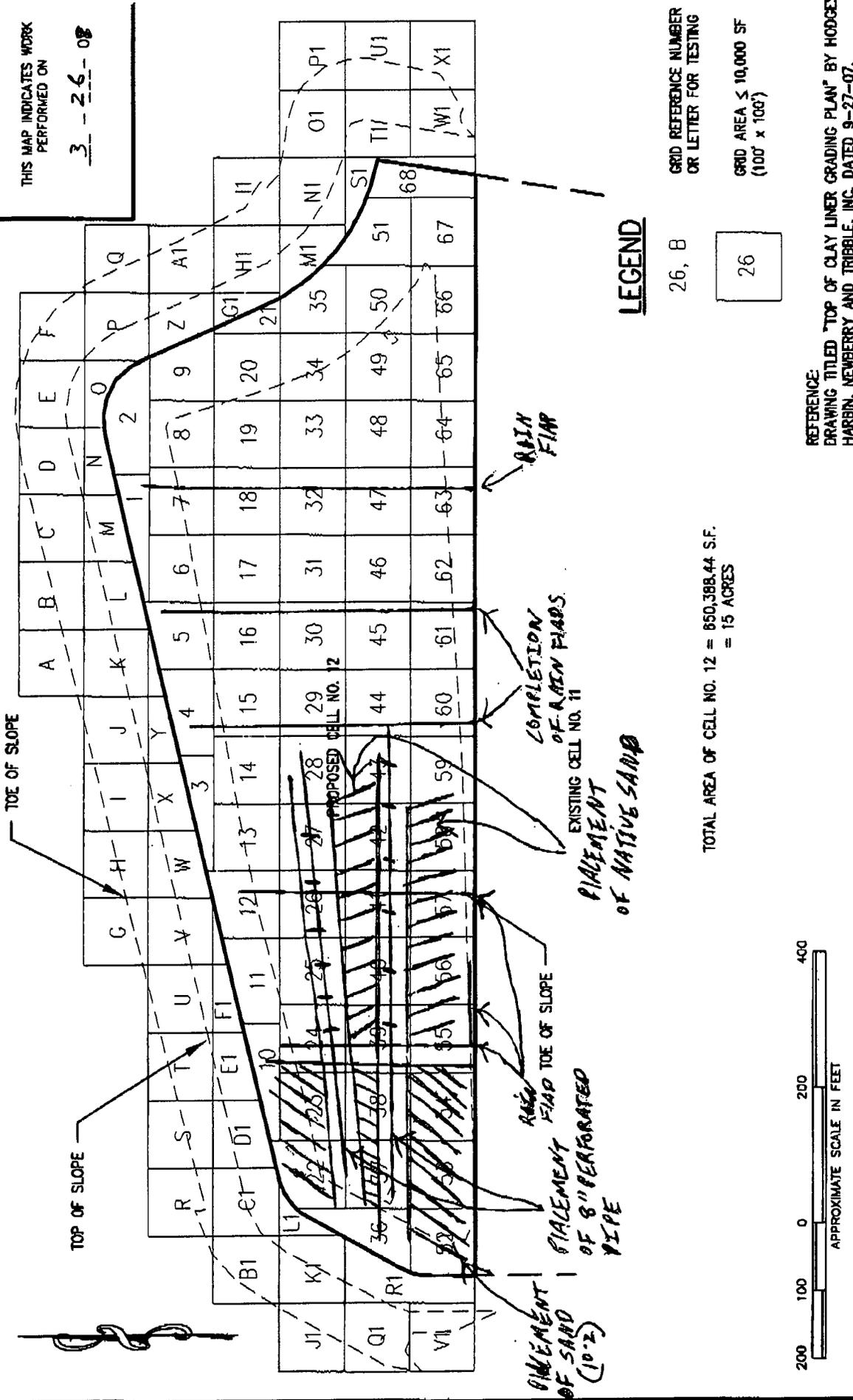
MONITORED PLACEMENT OF PROTECTIVE COVER  
MONITORED PLACEMENT OF 8" LEACHATE PIPE  
PERFORMED CQA ON RAIN FLAP INSTALLATION  
REVIEWED INSTALLATION AND LEACHATE COLLECTION SYSTEM  
WITH CQA ENGINEER.

RECORD PREPARED BY: John Martin JOHN MARTIN  
Signature

RECORD REVIEWED & APPROVED BY: Daniel Bunnell DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON

3-26-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH CHECKED: JAG APPROVED:	DATE: 11-01-07 CAD: ECUF58-FSC12 JOB NO: J07-1001-58	<p><b>IBL</b> INC.          BUNNELL-LAMMONS ENGINEERING, INC.          604 FOREST COUNTRY COURT          GREENSBORO, NC 27409          PHONE: (864)558-1285 FAX: (864)558-4430</p>	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	FIGURE <b>1</b>
---	--	--	---	--------------------

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3/27/08

PROJECT DAY NO. 144

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 7:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.5

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

John MARTIN

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 50 °F  
DAYTIME HIGH: 75 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

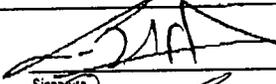
PLACEMENT OF PROTECTIVE COVER MATERIAL (NATIVE SOIL).  
PLACEMENT OF CLAYEY SOILS ON THE TOP OF THE NORTH BERM.  
CONSTRUCTED CROSSOVERS AT THE TWO WEST RAIN FLAPS.  
PLACEMENT OF 8" PERFORATED PIPE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED PLACEMENT OF CLAYEY SOILS ON THE NORTH BERM.  
MONITORED CONSTRUCTION OF THE CROSSOVERS.  
MONITORED ACTIVITY WITH THE 8" PIPE

RECORD PREPARED BY:

  
Signature TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

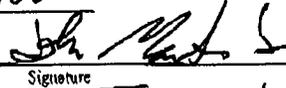
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3/27/08

PAGE 2 OF 2

CQA TECHNICIAN:

 JAY MARTIN

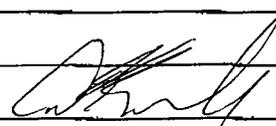
Signature

TEAR IN RAIN FLAP

RAIN FLAP #1 - BETWEEN PANEL 5-79 + 5-75  
ON NORTH SLOPE, PICKED UP BY WIND FROM  
THE WEST. TORE A HOLE IN THE LINER AT THE  
WELD ENDING. THE END OF THE WELD IS  
2' (PH) FROM TOP OF THE SLOPE + 58' (PH)  
FROM THE CUT AT THE 8" (IN) PIPE.

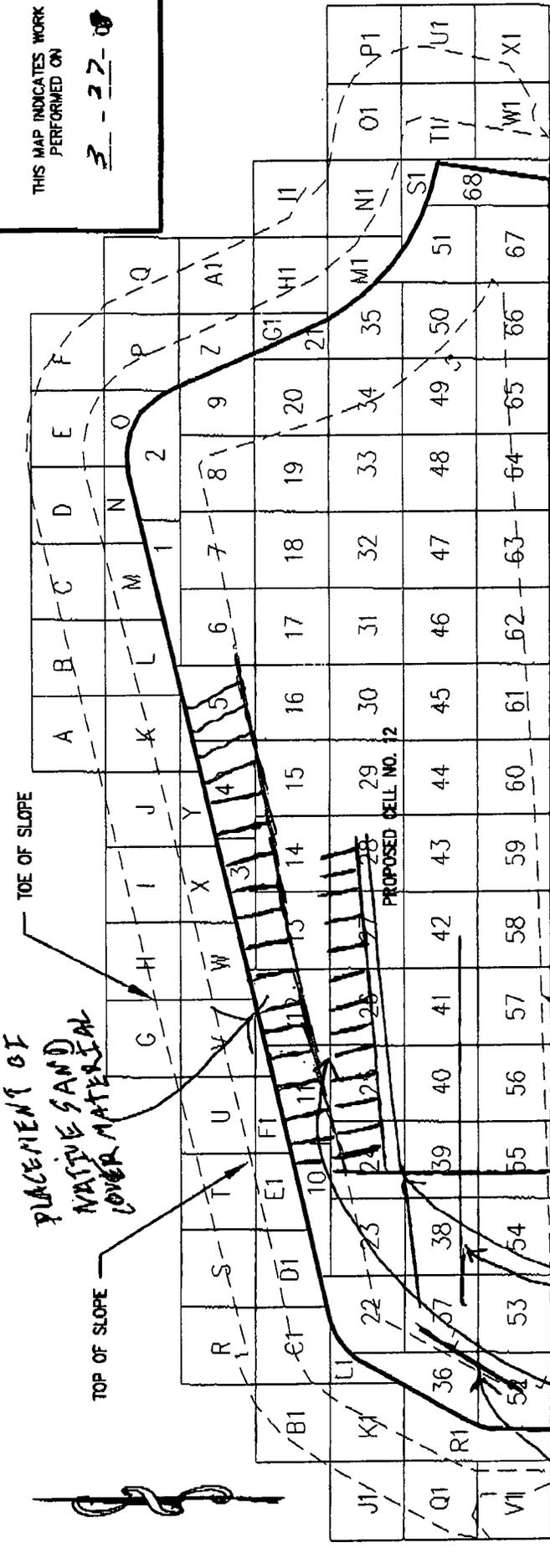
A.E.G. IS SCHEDULED TO REPAIR THE TEAR  
WHEN THEY RE-MOB' TO FINISH WELDING  
SECTIONS OF SOME OF THE RAINFLAPS.

-JEFF HENDERSON  
3-31-08

REVIEWED: 

THIS MAP INDICATES WORK PERFORMED ON

3-27-08



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES

EXISTING CELL NO. 11



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	<p><b>BUNNELL-LAMMONS ENGINEERING, INC.</b> 6004 POWERS COURT CREDENVILLE, SOUTH CAROLINA 29515 PHONE: (864)288-1286 FAX: (864)288-4430</p>	FIGURE
CHECKED: JAG	CAD: ECLF58-FSCCELL12		<p>FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA</p>
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3/28/08  
ARRIVAL TIME: 7:00 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 10.0

PROJECT DAY NO. 145

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
JOHN MARTIN SR.

WEATHER: ☁ CLOUDY ☁ CLOUDY  
☁ PTLY CLOUDY ☁ RAIN

TEMPERATURE:  
MORNING LOW: 58 °F  
DAYTIME HIGH: 80 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT OF #78M TRANS. MEDIA STONE ON WEST SIDE OF CELL  
WELDING CONNECTIONS FOR SUMP + CLEANOUTS IN + AROUND  
SUMP #12A

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF #78M TRANS. MEDIA STONE FOR LEACHATE LINES.  
MONITORED WELDING FOR LEACHATE SUMP + CLEANOUTS  
AROUND SUMP #12A

RECORD PREPARED BY:

John Martin Sr.  
Signature

JAY MARTIN  
TED STILES

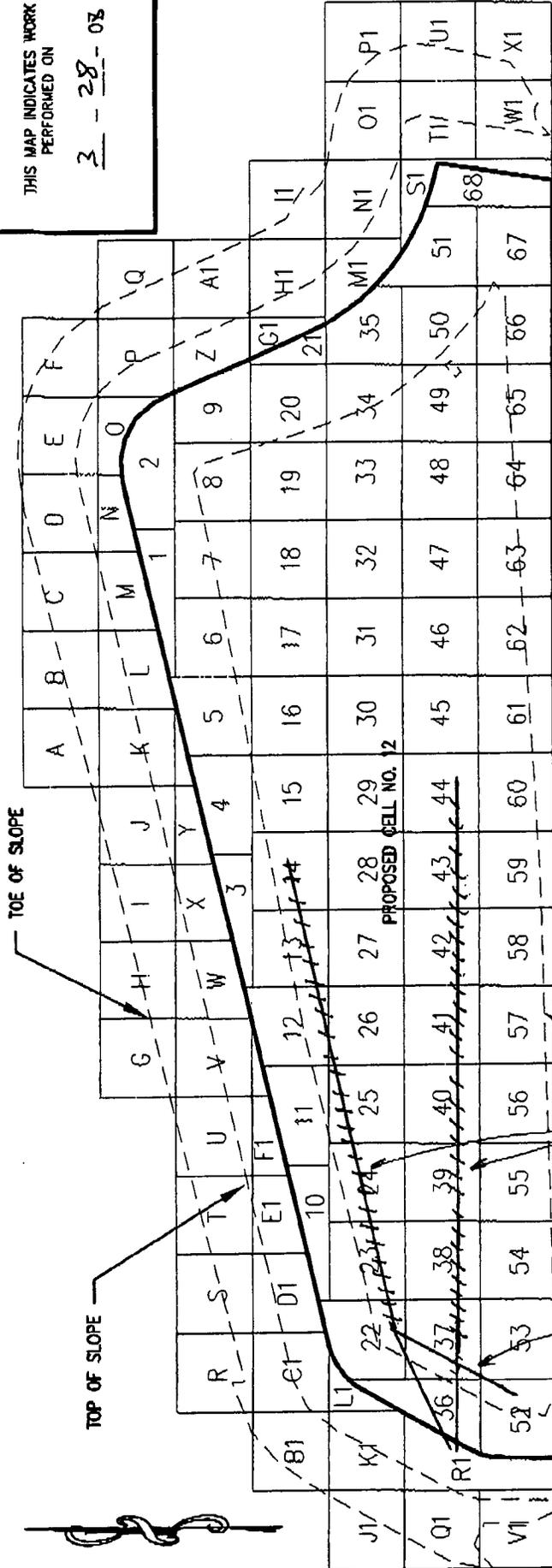
RECORD REVIEWED & APPROVED BY:

Daniel Bunnell  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

3 - 28 - 03



**LEGEND**

26, B  
 26



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES;  
 HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIGURE: 1
CHECKED: JAG	CAD: ECLF58-FSCCELL12	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: J07-1001-58	

**BLE** INC.  
 BUNNELL-LAWSON ENGINEERING, INC.  
 6004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE (864)288-1283 FAX (864)288-4430

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARRIN NEWBERRY & TRIBBLE, INC.

DATE: 3/29/08

PROJECT DAY NO. 146

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 7:30 PM

LUNCH BREAK: .5

WORK HOURS: 12P

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

JOHN MARTIN SR

WEATHER: SUNNY  
PTLY CLOUDY



TEMPERATURE:

MORNING LOW: 40 °F

DAYTIME HIGH: 56 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL



COMPACTED CLAY LINER  
LEACHATE COLLECTION



CONTRACTOR ACTIVITIES:

PLACING 57 STONE AROUND LEACHATE PIPE ON WEST SIDE OF CELL  
WELDING OF LEACHATE CLEANOUTS ON NORTH-EAST CORNER  
OF CELL + CAP ON SOUTH-EAST CORNER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF 57 STONE ON 8" (dia) PIPE  
MONITORED WELDING OF LEACHATE CLEANOUTS + CAP  
ON EAST END OF CELL.

RECORD PREPARED BY:

*[Handwritten Signature]*  
Signature

J. MARTIN  
TED STILES

RECORD REVIEWED & APPROVED BY:

*[Handwritten Signature]*  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

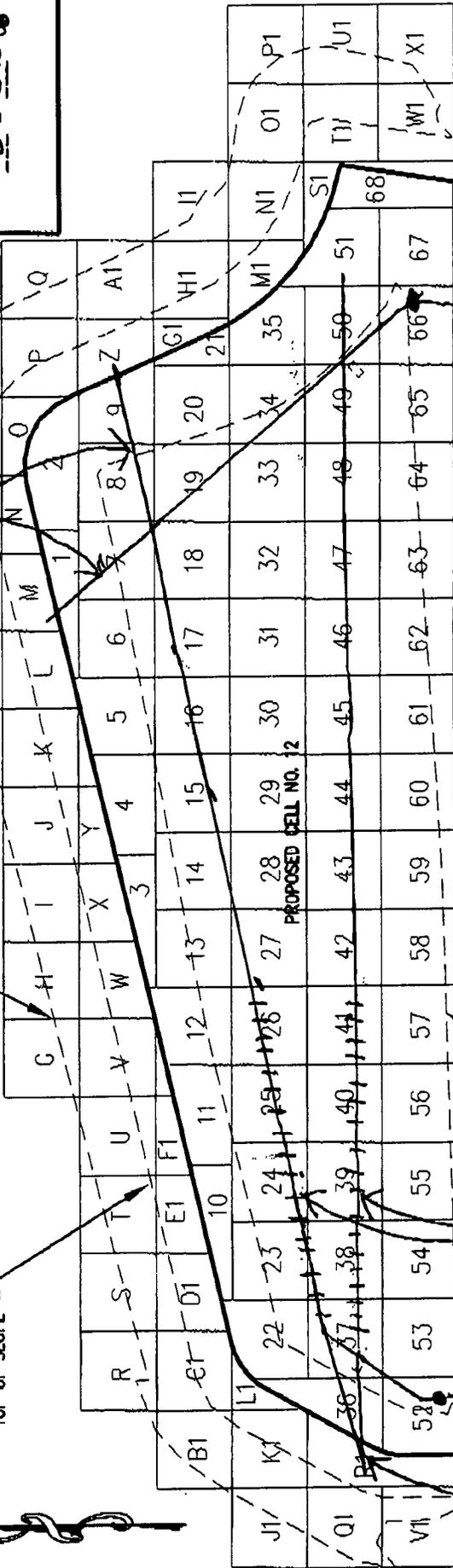
3 - 27-08

LEACHING CLEANOUTS

TOE OF SLOPE

TOP OF SLOPE

LEACHING CLEANOUTS



CAP  
3/29/08

TOE OF SLOPE  
PLACEMENT OF  
#57 STONE

EXISTING CELL NO. 11

**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

26 GRID AREA  $\leq 10,000$  SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH  
CHECKED: JAG  
APPROVED:

DATE: 11-01-07  
CAD: ECLF58-FSCCELL12  
JOB NO: J07-1001-58

**BLE** INC.  
BUNNELL-LAWSON ENGINEERING, INC.  
6004 PONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)258-1285 FAX: (864)258-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
FAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07:1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-30-08

PROJECT DAY NO. 147

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 3:00 PM

LUNCH BREAK: -

WORK HOURS: 8.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 45 °F  
DAYTIME HIGH: 53 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAINFALL WAS MEASURED AT 0.3". PUMPING WATER FROM THE SWAMPS.  
PLACEMENT OF #57 STONE IN THE SOUTHWEST LEACHATE LINE.  
LIGHT RAINFALL CONTINUED TO FALL THIS MORNING.  
ALL CONSTRUCTION ACTIVITY WAS HALTED AT 9:30. DUE TO RAINFALL  
AND DEPLETION OF THE #57 STONE STOCKPILE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF THE #57 STONE.  
REVIEWED THE GEOMEMBRANE AS BUILT DRAWING.

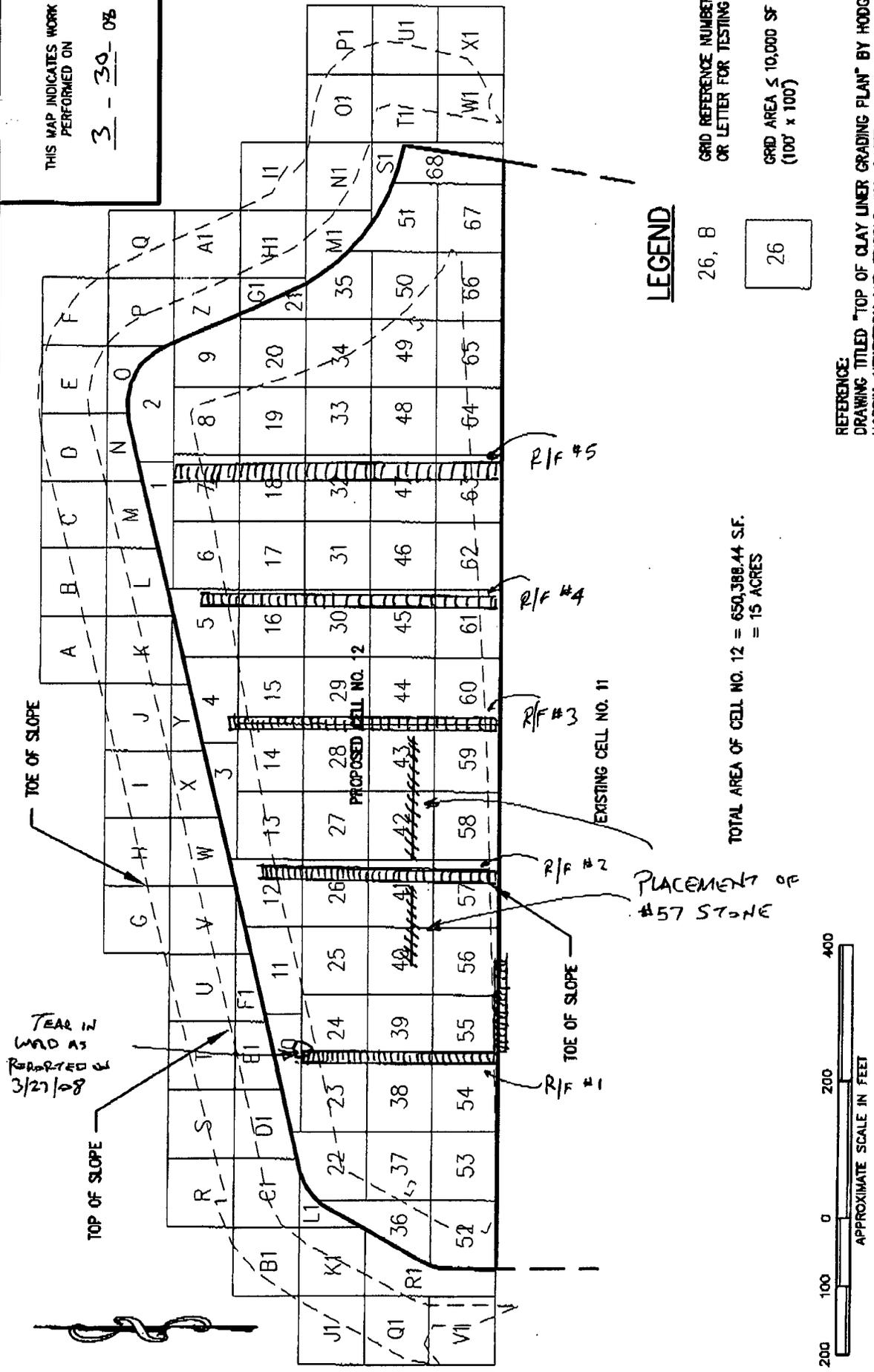
RECORD PREPARED BY:

Ted Stiles  
Signature \_\_\_\_\_ TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
Signature \_\_\_\_\_ DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON  
3 - 30 - 08



**LEGEND**

26, B      GRID REFERENCE NUMBER OR LETTER FOR TESTING

26      GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
 = 15 ACRES

REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE	<b>1</b>		
FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA			
<b>BLE</b> BURDELL-LAMBSONS ENGINEERING, INC. 800A PONDERS COURT GREENVILLE SOUTH CAROLINA 29615 PHONE: (864)288-1255 FAX: (864)288-4430			
DATE	11-01-07	DRAWN:	AEH
CAD:	ECLF58-FSCCELL12	CHECKED:	JAG
JOB NO:	107-1001-58	APPROVED:	



PLACEMENT OF #57 STONE

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

TEAR IN WAD AS REPORTED 3/27/08

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS-ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 3-31-08

PROJECT DAY NO. 148

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 12:00 PM

LUNCH BREAK: -

WORK HOURS: 5.0

VISITORS: NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER: SUNNY ~~RELOUD~~ WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 52 °F  
DAYTIME HIGH: 62 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

YESTERDAY'S RAIN FALL MEASURED AT 0.45". PUMPING WATER FROM THE SUMPS.

THERE WAS NO CONSTRUCTION ACTIVITY TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

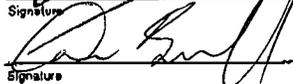
TECHNICIAN ACTIVITIES:

PERFORMED INVENTORY OF MATERIALS REMAINING AFTER COMPLETION OF GEOMEMBRANE LINER. (SEE ATTACHED PAGE 2)

RECORD PREPARED BY:

  
Signature TED STILES

RECORD REVIEWED & APPROVED BY:

  
Signature DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-31-08

CQA TECHNICIAN:  TED STILES

REMAINING MATERIALS LIST

- TEXTURED GEOMEMBRANE LINER

HT1-6-07-7547-5 LARGE PARTIAL

- RAIN FLAP/RUBSHEET SMOOTH GEOMEMBRANE LINER.

\* THIS MATERIAL IS NOT APPROVED AS CONTAINMENT GEOMEMBRANE.

H52-6-07-1297-5 FULL ROLL

H52-6-07-1294-5 SMALL PARTIAL

- 802 PROPEX GEOTEXTILE FABRIC

10 FULL ROLLS - THIS MATERIAL IS NOT EXTRA. IT WAS ORDERED TO COVER THE TOP OF DRAINAGE STONE. EACH ROLL IS 15' X 300'.

FOR A TOTAL OF 3000 LF. OF MATERIAL. THERE IS, PER BID

DOCUMENTS, 3100 LF. OF DRAINAGE STONE. 2400 LEACHATE LINE

AND 700 TBE DRAIN LINE. THIS DOES NOT INCLUDE THE SURFACE

AREA AT THE SUMPS. HOWEVER, 2 ROLLS OF 6-054

FABRIC ARE AVAILABLE FOR USE TO COVER THE SUMPS.

REVIEWED: 

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-1-08

PROJECT DAY NO. 149

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 3:00 PM

LUNCH BREAK: -

WORK HOURS: 8.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY  CLOUDY WINDY   
 PTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 61 °F  
 DAYTIME HIGH: 75 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER MATERIAL.  
EXCAVATION OF CLAYEY SOILS FROM THE NORTH DITCH AND PLACEMENT  
OF THIS MATERIAL ON THE NORTH BERM OF CELL 12.  
RAIN SHOWERS BEGAN ON/OFF AT 10:20 AM.  
PLACEMENT OF THE 602. WRAP ON THE 8" SOLID PIPE L-8.  
ALL CONSTRUCTION ACTIVITY WAS HALTED AT 11:30, DUE TO RAIN.  
RECEIVING #57 STONE. THIS MATERIAL IS BEING STOCKPILED WEST  
OF CELLS 10/11.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

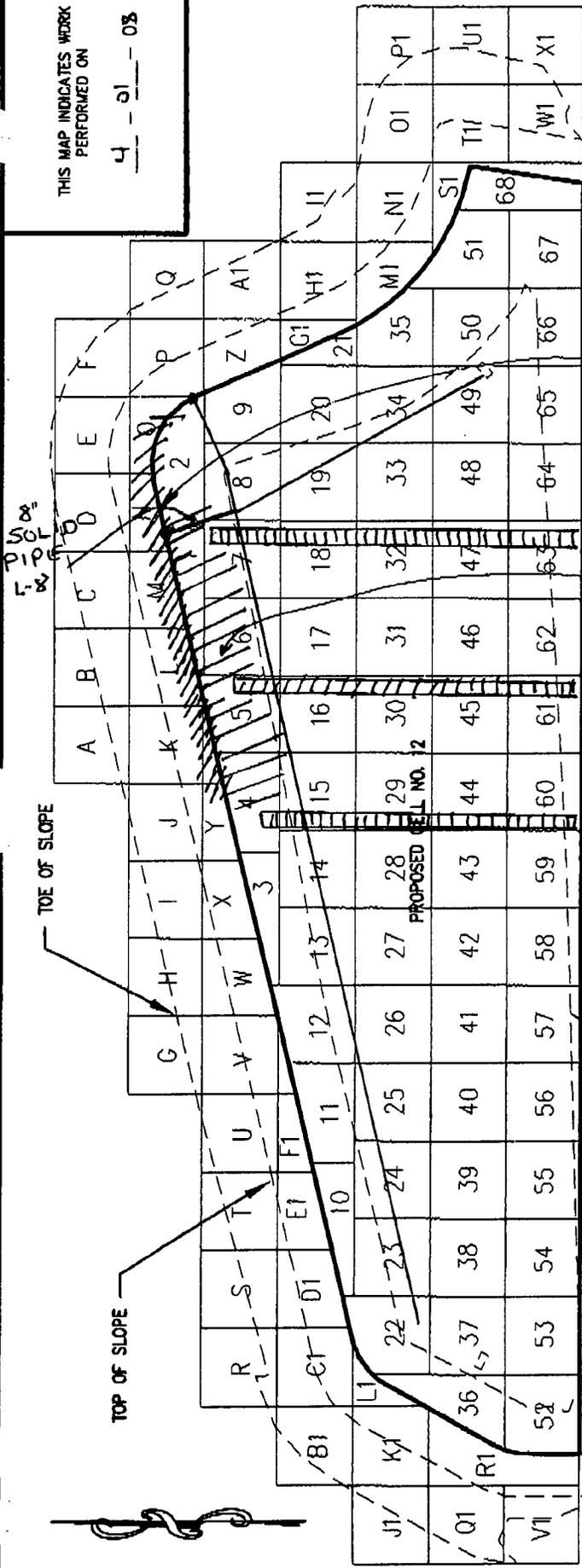
MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED PLACEMENT OF CLAYEY SOILS ON THE NORTH BERM.  
CONTRACTOR/CQA MEETING: PLASTIC FUSION FABRICATORS IS SCHEDULED FOR 4-7-08  
TO WELD 24" RISER PIPE, 10"X6" FORCE MAIN (TO INCLUDE WORK AT MANHOLE #11) AND  
COMPLETE 8" CONNECTIONS AT SUMP 12B.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-01-03



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

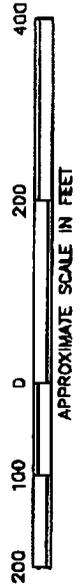
GRID AREA  $\leq 10,000$  SF (100' x 100')

26

PLACEMENT OF CLAYEY SOILS ON THE NORTH BEAM

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODG HARRIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIG. NO.:	1
CHECKED: JAG	CAD: ECLF58-FSCCELL12	PROJECT:	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL
APPROVED:	JOB NO: J07-1001-58	LOCATION:	BERTIE COUNTY, NORTH CAROLINA

**BLE** INC.  
**BUNNELL-LAWSON ENGINEERING, INC.**  
 804 FORTNOTS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE (864)288-1285 FAX (864)288-4430

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC..PROJECT NO. J07.1001-98

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-2-08

PROJECT DAY NO. 150

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:

NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES

STEVE NICHING R.B. BAKER

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 64 °F  
DAYTIME HIGH: 65 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

YESTER DAY'S RAIN FALL WAS MEASURED AT 0.15".  
PLACEMENT OF THE 602. WRAP ON THE 8" SOLID PIPE L-9.  
PLACEMENT OF NATIVE SOIL PROTECTIVE COVER MATERIAL.  
EXCAVATION OF CLAYEY SOILS FROM THE EAST DITCH AND PLACEMENT  
OF THIS MATERIAL ON TOP OF THE EAST BERM OF CELL 12.  
RECEIVING #57 STONE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED PLACEMENT OF CLAYEY SOILS ON THE EAST BERM.  
PERFORMED DRIVE CYLINDER DENSITY TESTS AT SUBGRADE IN THE ACCESS  
ROAD NORTH OF CELL 12. THE FILL MATERIAL WAS PLACED AND COMPACTED  
DURING GED MEMBRANE DEPLOYMENT.

RECORD PREPARED BY:

*Ted Stiles*  
Signature

TED STILES

RECORD REVIEWED & APPROVED BY:

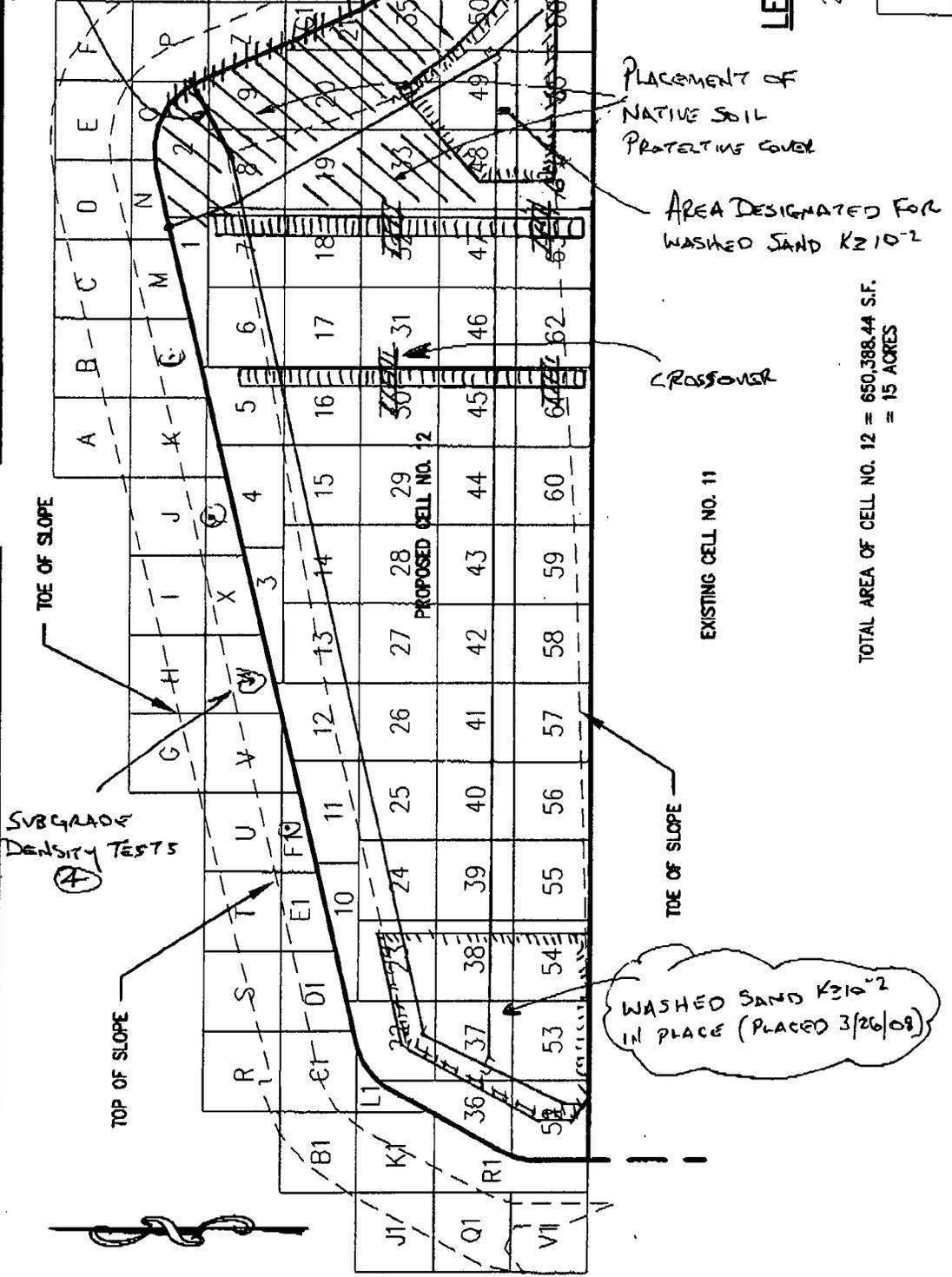
*Daniel Bunnell*  
Signature

DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-2-08

Topog = 1:2500



PLACEMENT OF CLAYEY SOILS ON THE EAST BERM

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER

AREA DESIGNATED FOR WASHED SAND K210-2

CROSSOVER

EXISTING CELL NO. 11

WASHED SAND K210-2 IN PLACE (PLACED 3/26/08)

**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGE HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07	FIGURE	1
DRAWN:	AEH	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
CHECKED:	JAG	BUNNELL-LAUNING ENGINEERING, INC. 6024 POWERS COURT, 29916 GREENSBORO, NORTH CAROLINA PHONE: (864)268-1285 FAX: (864)268-4430	
APPROVED:	J07-10G1-58		

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4/3/08

PROJECT DAY NO. 151

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: D.D

ONSITE BLE PERSONNEL: TED STILES

VISITORS:  
 NAME REPRESENTING

WEATHER: SUNNY  CLOUDY WINDY   
~~PRECIPITATION~~ RAIN

TEMPERATURE:  
 MORNING LOW: 45 °F  
 DAYTIME HIGH: 63 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER.  
THE THREE EASTERN RAIN FLAPS HAVE BEEN FLIPPED AT THE NORTH  
LEACHATE LINE. THE 8" PERFORATED PIPE HAVE BEEN ALIGNED AT THE  
RAIN FLAPS.  
RECEIVING #57 STONE.  
PLACEMENT OF #78A STONE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED ACTIVITY INVOLVED IN FLIPPING THE RAIN FLAPS.  
MONITORED PLACEMENT OF #78A STONE.  
PERFORMED DRIVE CYLINDER DENSITY TESTS IN THE ACCESS ROAD AT SUBGRADE.  
THE MATERIAL WAS PLACED AND COMPACTED DURING GEOMEMBRANE INSTALLATION.

RECORD PREPARED BY:

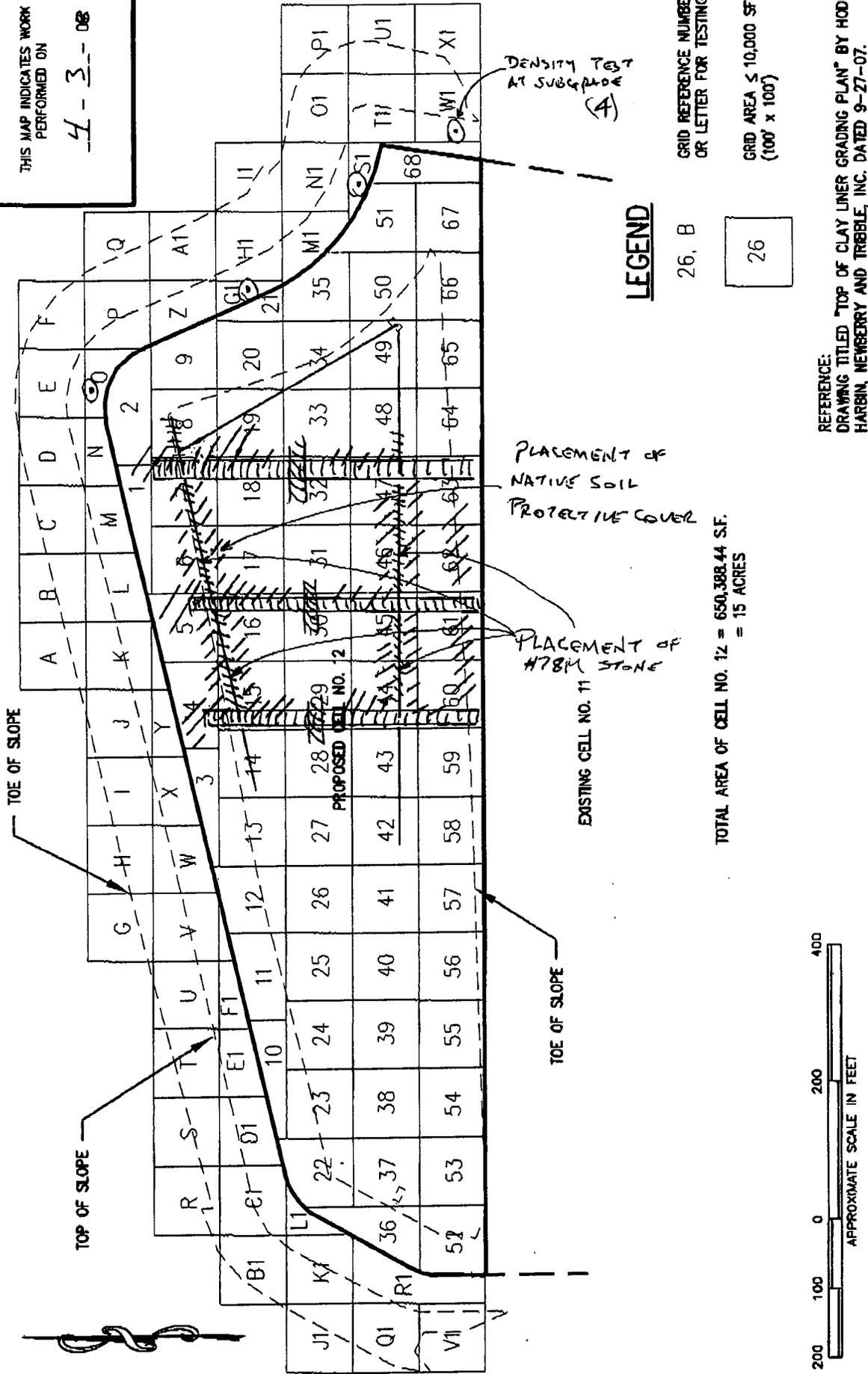
 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-3-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	FIGURE: 1
	CAD: ECLF58-FSC112	
CHECKED: JAG	JOB NO: J07-1001-58	
APPROVED:		

**IBL**  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
 6004 POWERS COURT  
 GREENVILLE SOUTH CAROLINA 29615  
 PHONE: (864)288-1288 FAX: (864)288-1430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-4-08

PROJECT DAY NO. 152

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 54 °F  
DAYTIME HIGH: 79 °F

EQUIPMENT: SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

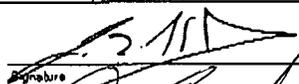
OVERNIGHT RAINFALL WAS MEASURED AT 0.55". PUMP WATER FROM THE SUMPS  
PLACEMENT OF #57 STONE.  
BLADING ACCESS ROAD (1:00PM) TO BEGIN PLACEMENT OF WASHED SAND  
IN THE DESIGNATED AREA IN THE EAST END OF THE CELL.  
RECEIVING #57 STONE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

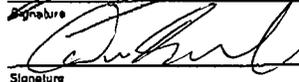
TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF #57 STONE.  
MONITORED PLACEMENT OF WASHED SAND ( $K \geq 10^{-2}$  CM/SEC).  
CONTRACTOR/CQA MEETING: THE REQUIRED QUANTITY OF #78 STONE IS ON SITE.  
ADDITIONAL #57 IS REQUIRED TO COMPLETE THE SUMPS.

RECORD PREPARED BY:

 TED STILES

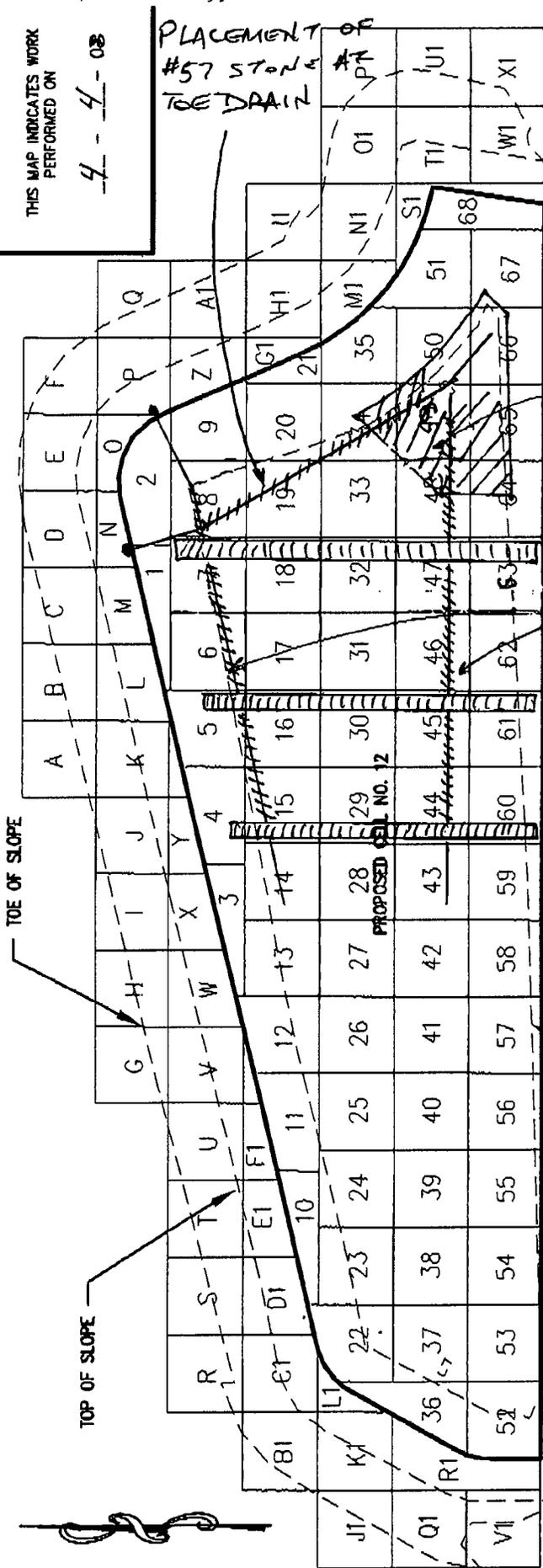
RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-4-08

PLACEMENT OF #57 STONE AT TOE DRAIN



**LEGEND**

26, B  
GRID REFERENCE NUMBER OR LETTER FOR TESTING

26  
GRID AREA  $\leq 10,000$  SF (100' x 100')



TOTAL AREA OF CELL NO. 12 = 650,388.44 SF.  
= 15 ACRES.

REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH  
CHECKED: JAG  
APPROVED:

DATE: 11-01-07  
CAD: ECLF58-FSC0112  
JOB NO: J07-1001-58

**BLE**  
BUNNELL-LAWSON ENGINEERING, INC.  
6004 FORDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE (864)286-1285 FAX (864)286-4430

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-5-08

PROJECT DAY NO. 153

ARRIVAL TIME: / AM

DEPARTURE TIME: / PM

LUNCH BREAK: /

WORK HOURS: /

ONSITE BLE PERSONNEL: TED STILES

VISITORS: NAME REPRESENTING

WEATHER: SUNNY (CLOUDY) WINDY  
PTLY CLOUDY (RAIN)

TEMPERATURE: MORNING LOW: 63 °F  
DAYTIME HIGH: 71 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAIN FALL COMBINED WITH FORECASTS OF 1" TO 2" TODAY  
HAS STOPPED ALL CONSTRUCTION ACTIVITY.  
PUMPING WATER FROM THE SUMPS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

RECORD PREPARED BY:

 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRUBBLE, INC.

DATE: 4-6-08

PROJECT DAY NO. 154

ARRIVAL TIME: 7:00 AM

DEPARTURE TIME: 12:00 PM

LUNCH BREAK: -

WORK HOURS: 5.0

-VISITORS:  
NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  WINDY   
PARTLY CLOUDY  CLOUDY   
RAIN

TEMPERATURE:  
MORNING LOW: 52 °F  
DAYTIME HIGH: 62 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

WEEKEND RAINFALL TOTAL SO FAR IS 1.1".  
PUMPING WATER FROM THE SUMPS AND FUELING ALL PUMPS.  
THERE WAS NO CONSTRUCTION ACTIVITY TODAY.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

ON SITE MONITORING CONDITIONS AND RAINFALL TOTAL.

CONTRACTOR/CQA MEETING: PLASTIC FUSION FABRICATORS WILL MOBILIZE  
ON TUESDAY (BE ON SITE WEDNESDAY). POSSIBLE COMPLETION OF PROTECTIVE  
COVER PLACEMENT ON TUESDAY. DRAINAGE STONE COMPLETION PENDING  
ADDITIONAL #57 STONE DELIVERY AND PLACEMENT OF 24" RISER PIPE.

RECORD PREPARED BY: TED STILES

RECORD REVIEWED & APPROVED BY: DANIEL B. BUNNELL, P.E.

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-7-08  
 ARRIVAL TIME: 7:30 AM  
 DEPARTURE TIME: 5:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 9.5  
 ONSITE PERSONNEL: TED STILES

PROJECT DAY NO. 155

VISITORS:  
 NAME REPRESENTING

RAY HOFFMAN, PE REPUBLIC

WEATHER: SUNNY ~~CLOUDY~~ WINDY  
 PTLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 46 °F  
 DAYTIME HIGH: 57 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
 STRUCTURAL FILL  LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

YESTERDAY'S RAINFALL TOTAL WAS MEASURED AT 0.1". LIGHT DRIZZLE IS FALLING THIS MORNING.  
PLACEMENT OF 802 GEOTEXTILE FABRIC ABOVE THE GRADED DRAINAGE STONE. THE FABRIC EDGES HAVE BEEN SECURED WITH PROTECTIVE COVER MATERIAL AND #78 STONE.  
RECEIVING #57 STONE.  
THE SATURATED MATERIAL BLADED FROM THE ACCESS ROAD IS BEING HAULED TO THE EXHAUSTED AREA IN THE TRIPP PROPERTY BORROW AREA.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED GRADING OF DRAINAGE STONE AND PLACEMENT OF THE 802 GEOTEXTILE FABRIC.  
MONITORED PLACEMENT OF WASHED SAND PROTECTIVE COVER.  
MONITORED PLACEMENT OF NATIVE SOIL PROTECTIVE COVER.

RECORD PREPARED BY:

Ted Stiles  
 Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell  
 Signature DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-7-08

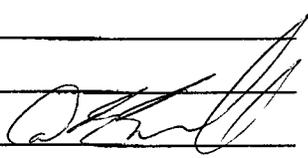
PAGE 2 OF 2

CQA TECHNICIAN:  TED STILES  
Signature

CONTRACTOR ACTIVITIES:

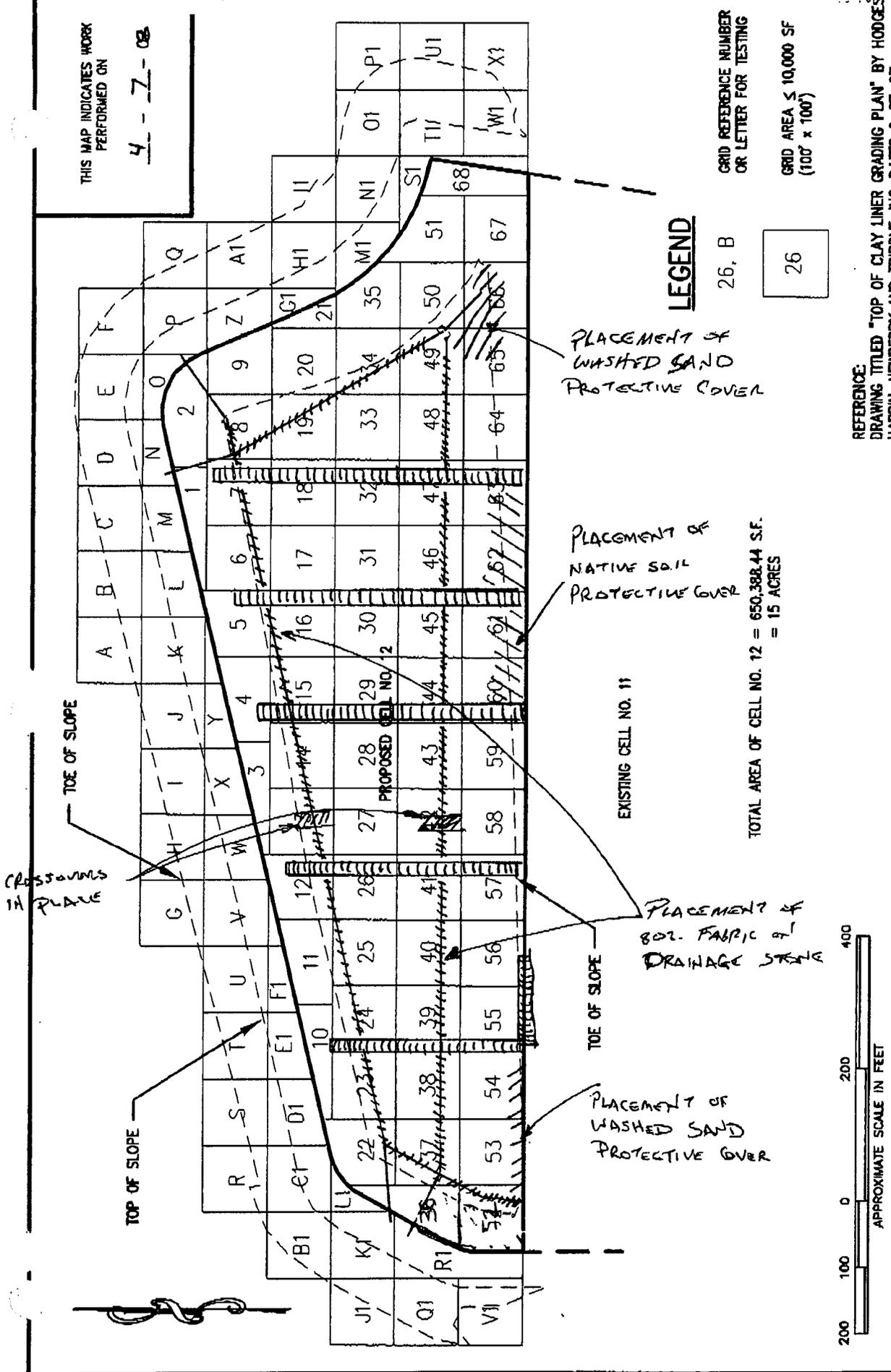
PLACEMENT OF WASHED SAND PROTECTIVE COVER MATERIAL. THE  
STOCKPILE OF WASHED SAND MATERIAL HAS BEEN DEPLETED. AN  
ADDITIONAL 250 TONS IS REQUIRED TO COMPLETE THE WASHED  
SAND PLACEMENT.

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER MATERIAL.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

4-7-02



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE	1		
FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA			
<b>IBL</b> INC.			
<b>RUMBLE-LAMBORN ENGINEERING, INC.</b>			
8004 PONDERS COURT GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864) 228-1285 FAX: (864) 228-4430			
DRAWN: AEH	DATE: 11-01-07		
CHECKED: JAG	CAD: ECLF58-FSC0112		
APPROVED:	JOB NO: J07-1001-58		

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-8-08  
ARRIVAL TIME: 7:30 AM  
DEPARTURE TIME: 5:30 PM  
LUNCH BREAK: .5  
WORK HOURS: 9.5

PROJECT DAY NO. 156

VISITORS:  
NAME REPRESENTING

PAUL HOFFMAN, P.E. REPUBLIC  
STEVE NICHOLS R.B. BAKER

ONSITE BLE PERSONNEL: TED STILES  
\_\_\_\_\_  
\_\_\_\_\_

WEATHER: SUNNY  CLOUDY  WINDY   
PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 46 °F  
DAYTIME HIGH: 61 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

(STRUCTURAL FILL PAD)  
CONSTRUCTED THE WELL PAD FOR GW-17, PER THE REVISED SKETCH  
DATED 3-28-08.  
PLACEMENT OF NATIVE SOIL PROTECTIVE COVER MATERIAL.  
PLACEMENT OF CLAYEY SOILS ON THE EAST AND WEST BERMS.  
RECEIVING #57 STONE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED CONSTRUCTION OF THE GW-17 WELL PAD.  
MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED PLACEMENT OF CLAYEY SOILS.

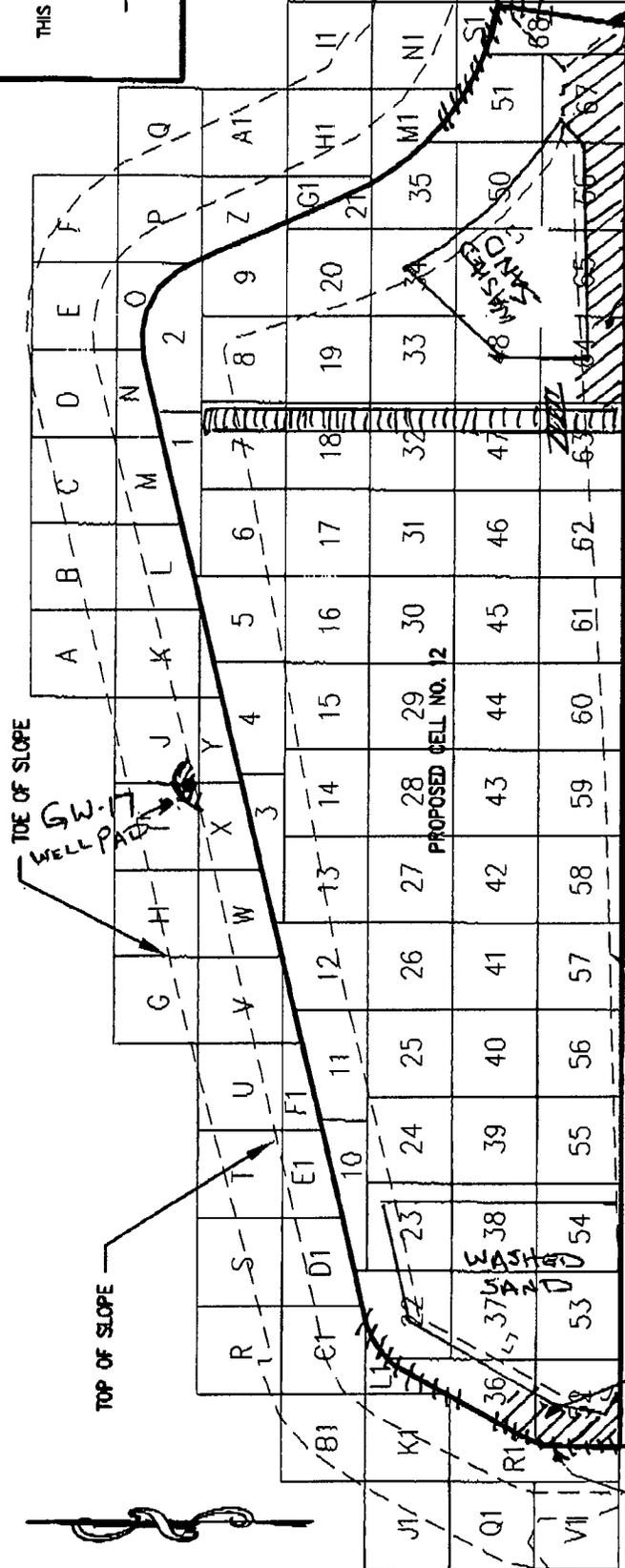
CONTRACTOR/COA MEETING: GUNNCO SCHEDULED FOR 4-15-08. R.B. BAKER AND REPUBLIC  
WORKING TOGETHER TO PROVIDE GAS/OXYGEN METERS FOR MANHOLE #11 AND CONFINED  
SPACE PERSONNEL IF NEEDED.

RECORD PREPARED BY: [Signature] TED STILES

RECORD REVIEWED & APPROVED BY: [Signature] DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-8-08



PLACEMENT OF CLAYEY SOILS

AREA APPLICABLE FOR RELEASE OF AIR

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER

PLACEMENT OF NATIVE SOIL PROTECTIVE COVER

PLACEMENT OF CLAYEY SOILS

EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES

**LEGEND**

26, B

GRID AREA ≤ 10,000 SF  
(100' x 100')

26



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES  
HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	<p><b>IBL</b> <small>INC.</small></p> <p><b>BUNNELL-LAWSON ENGINEERING, INC.</b></p> <p>6004 ARDURS COURT GREENSBORO, NC 27405 PHONE: (847)286-1205 FAX: (847)286-4430</p>	FIGURE	
CHECKED: JAG	CAD: ECLF58-FSC0112		<p>FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA</p>	<p><b>1</b></p>
APPROVED:	JOB NO: J07-1001-58			

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-9-08

PROJECT DAY NO. 157

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 9.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 48 °F  
DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

LIGHT DRIZZLE IS FALLING THIS MORNING  
PLACEMENT OF NATIVE SOIL PROTECTIVE COVER MATERIAL.  
RECEIVING WASHED SAND PROTECTIVE COVER MATERIAL. THIS MATERIAL  
IS BEING STOCKPILED NORTH OF CELL 12.  
FINE GRADING PROTECTIVE COVER.  
PLACEMENT OF CLAYEY SOILS ON THE EAST BERM.  
EXCAVATION OF THE FORCE MAIN TRENCH.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF PROTECTIVE COVER.  
MONITORED FINE GRADING ACTIVITY.

CONTRACTOR/COA MEETING: PLASTIC FUSION FABRICATORS IS NOT EQUIPPED FOR  
THE FORCE MAIN INSTALLATION ON THIS TRIP.

RECORD PREPARED BY: [Signature] TED STILES

RECORD REVIEWED & APPROVED BY: [Signature] DANIEL B. BUNNELL, P.E.



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-10-08

PROJECT DAY NO. 158

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 6:30 PM

LUNCH BREAK: .5

WORK HOURS: 10.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY WINDY

pm CLOUDY RAIN  
PTLY CLOUDY

TEMPERATURE:

MORNING LOW: 54 °F

DAYTIME HIGH: 75 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PUMPING WATER FROM THE 12B SUMP.  
PLASTIC FUSION FABRICATORS IS ON SITE WELDING THE 24" RISER PIPE.  
EXCAVATION OF THE FORCE MAIN TRENCH ALONG THE EAST ACCESS ROAD.  
PLACEMENT OF WASHED SAND PROTECTIVE COVER. THE STOCKPILE HAS BEEN DEPLETED. ADDITIONAL MATERIAL IS REQUIRED.  
FINE GRADING PROTECTIVE COVER. THE GRADED EXCESS IS BEING PLACED ALONG THE RAIN FLAPS (BACK SIDE).

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

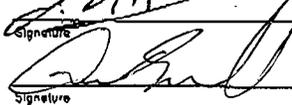
MONITORED ACTIVITY AT THE 12B SUMP.  
MONITORED FUSION WELDING OF THE 24" RISER PIPE.  
MONITORED PLACEMENT OF THE WASHED SAND PROTECTIVE COVER.  
MONITORED ACTIVITY INVOLVED IN SETTING THE RAIN FLAP IN PLACE.  
MONITORED ALL ACTIVITY INVOLVED IN PLACEMENT OF THE 24" RISER PIPE AT SUMP 12 B.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-12-08

PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

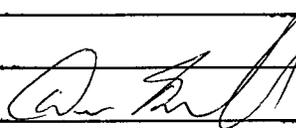
CONTRACTOR ACTIVITIES &

THE SOUTH SLOPE SECTION OF THE EASTERN MOST RAIN FLAP  
HAS BEEN SET IN PLACE.

RECEIVING WASHED SAND PROTECTIVE COVER MATERIAL.

PLACEMENT OF THE TWO 24" RISER PIPE WITH 8'x8'x2" FLAT STOCK  
AT SUMP 12 B. PLACEMENT OF 8" SOLID PIPE WITH 602. WRAP AT SUMP 12 B.  
\* RAIN FLAP DETAILS.

- EASTERN MOST RAIN FLAP (3 PIECES: SOUTH SLOPE, FLOOR & NORTH SLOPE)
- SECOND FROM EAST (2 PIECES: FLOOR w/ SOUTH SLOPE & NORTH SLOPE)
- CENTER (2 PIECES: FLOOR w/ SOUTH SLOPE & NORTH SLOPE)
- TWO WESTERN FLAPS (1 PIECE EACH; 11'-6" WIDE EACH.)



THIS MAP INDICATES WORK PERFORMED ON

4-10-08

EXCAVATION OF THE FORCE MAIN TRENCH

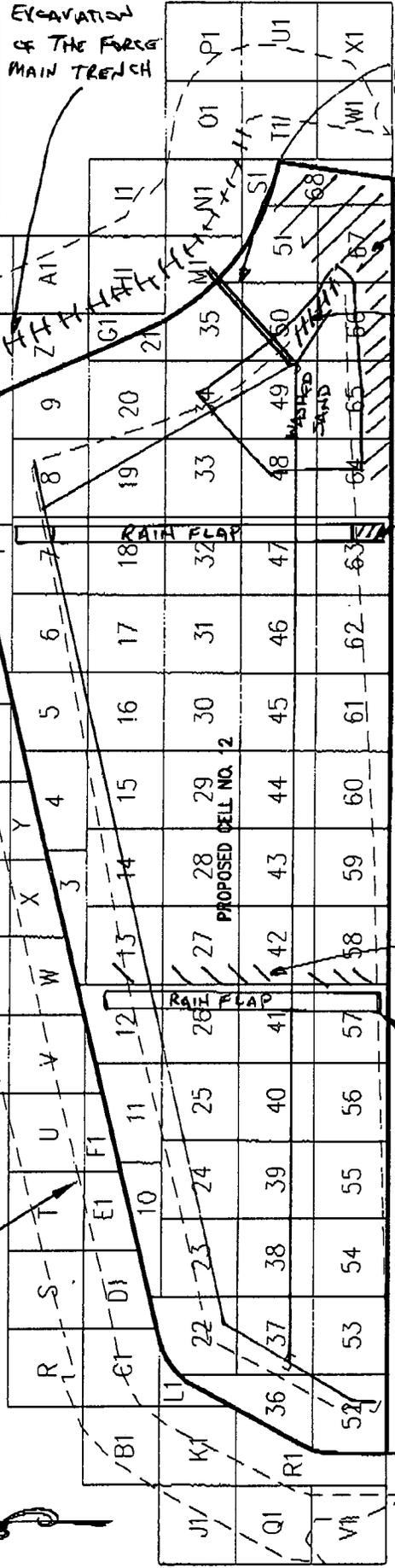
Two 24" RISER PIPE EACH WITH A 4'x5'12" BASE AND 16'4" SECTION OF PERFORATED PIPE

GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA 5 10,000 SF (100' x 100')

TOE OF SLOPE

TOP OF SLOPE



**LEGEND**

26, B

26

TOTAL AREA OF CELL NO. 12 = 850,388.44 SF. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE	11-01-07
CAD	EGLF58-FSC112
JOB NO	J07-1001-58
DATE	11-01-07
CAD	EGLF58-FSC112
JOB NO	J07-1001-58

**IBL** INC.  
**BUNDEL-LAMMONS ENGINEERING, INC.**  
 6004 FONDERS COY.  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1253 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-11-08  
 ARRIVAL TIME: 7:30 AM  
 DEPARTURE TIME: 5:30 PM  
 LUNCH BREAK: .5  
 WORK HOURS: 9.5

PROJECT DAY NO. 159

ONSITE PERSONNEL: TED STILES  
 \_\_\_\_\_  
 \_\_\_\_\_

VISITORS:  
 NAME REPRESENTING  
STEVE NICHING REPUBLIC  
 \_\_\_\_\_  
 \_\_\_\_\_

WEATHER: SUNNY  <sup>AM</sup> CLOUDY  WINDY   
 PM PFTLY CLOUDY  RAIN

TEMPERATURE:  
 MORNING LOW: 57 °F  
 DAYTIME HIGH: 83 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION	<input type="checkbox"/>	COMPACTED CLAY LINER	<input type="checkbox"/>
STRUCTURAL FILL	<input checked="" type="checkbox"/>	LEACHATE COLLECTION	<input checked="" type="checkbox"/>

**CONTRACTOR ACTIVITIES:**

PLASTIC FUSION FABRICATORS IS ON SITE WELDING 24" RISER PIPE.  
PLACEMENT AND COMPACTION OF STRUCTURAL FILL IN THE ACCESS ROAD  
WEST OF THE CELL.  
EXCAVATION OF THE FORCE MAIN TRENCH WEST OF THE CELL AND  
AT MANHOLE #11.  
R.B. BAKER HAS SET UP EAST CAROLINA'S 6" PUMP AT THE 12 B SUMP.  
WELDING THE 8" TEE CONNECTIONS AT THE 12 B SUMP.  
PLACEMENT OF #78 AND #57 STONE AT SUMP 12 B.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED FUSION OF 24" RISER PIPE  
MONITORED PLACEMENT AND COMPACTION OF STRUCTURAL FILL.  
MONITORED FUSION OF THE 8" TEE CONNECTIONS AT SUMP 12 B.  
MONITORED PLACEMENT OF DRAINAGE STONE AT SUMP 12 B.

RECORD PREPARED BY:

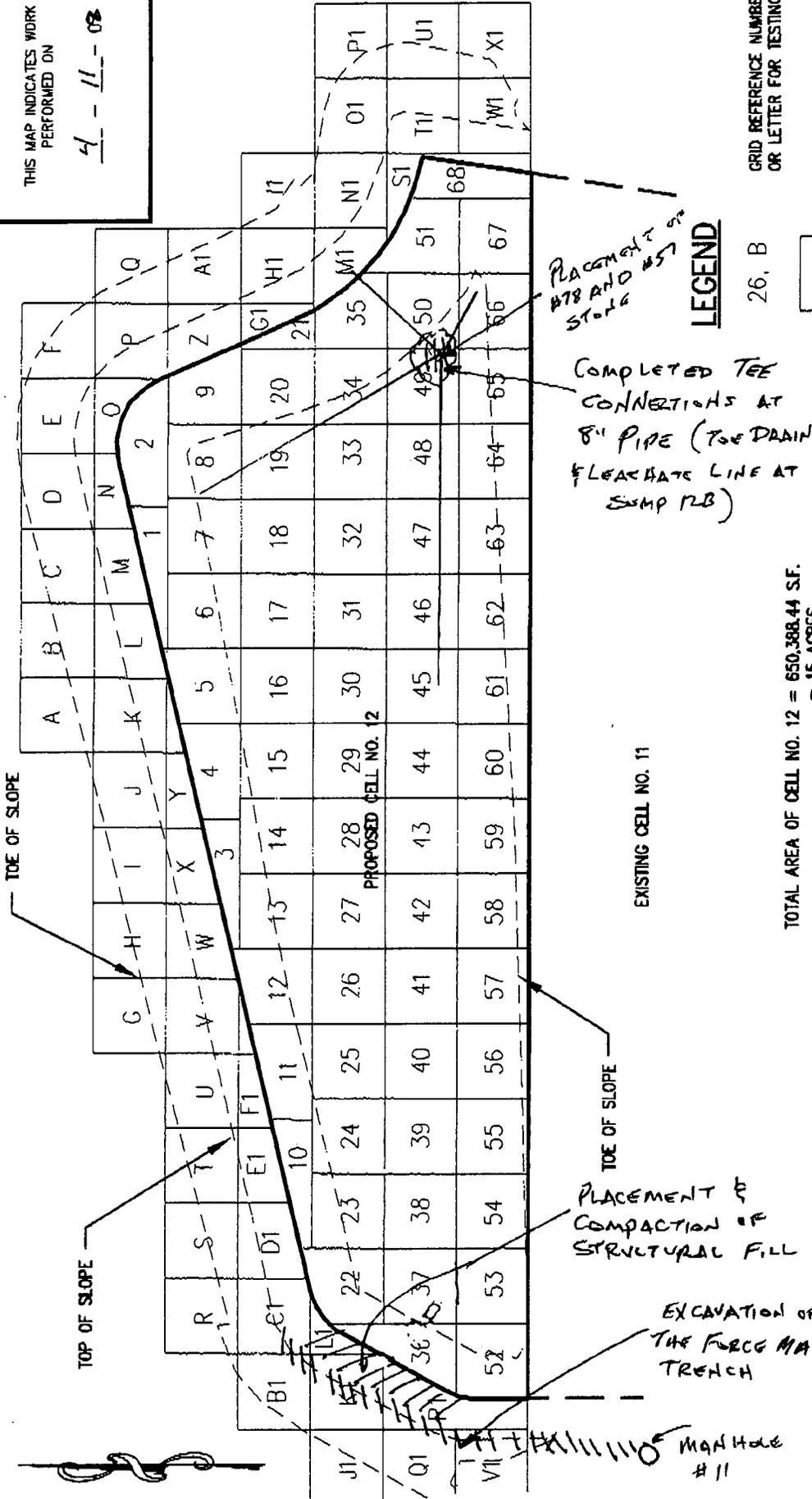
  
 Signature TED STILES

RECORD REVIEWED & APPROVED BY:

  
 Signature DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-11-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

26

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE **1**

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**BLE** INC.  
BUNNELL-LAMBSONS ENGINEERING, INC.  
6004 PONDERS DR.  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864)288-1285 FAX: 788-4430

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



NO:	AEH	DATE:	11-01-07
CD:	JAG	CAD:	ECLF58-FSCCELL12
REV:		JOB NO:	J07-1001-58

PLACEMENT OF #78 AND #57 STONE

COMPLETED TEE CONNECTIONS AT 8" PIPE (TOE DRAIN FLECKHATE LINE AT SUMP #2B)

PLACEMENT & COMPACTION OF STRUCTURAL FILL

EXCAVATION OF THE FORCE MAIN TRENCH

MANHOLE #11

EXISTING CELL NO. 11

PROPOSED CELL NO. 12

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-12-08

PROJECT DAY NO. 160

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 4:30 PM

LUNCH BREAK: .5

WORK HOURS: 8.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PTLY CLOUDY RAIN PM

TEMPERATURE:  
MORNING LOW: 64 °F  
DAYTIME HIGH: 80 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

THE 24" RISER PIPE AND 8" SOLID LEACHATE PIPE HAVE BEEN CUT TO THE REQUIRED LENGTH AT THE TOP OF SLOPE ABOVE SUMP 12 B.  
PLACEMENT OF CLAYEY SOILS ON THE EAST BERM TO SECURE THE 24" AND 8" PIPES AT THE REQUIRED ELEVATION.  
PLACEMENT OF NATIVE SOIL PROTECTIVE COVER ABOVE THE 24" RISER PIPE ON THE EAST SLOPE.  
EXCAVATION OF THE 2" X 4" D.S. FORCE MAIN TRENCH ABOVE SUMP 12 B.  
FINE GRADING PROTECTIVE COVER.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT OF CLAYEY SOILS AROUND THE 24" AND 8" PIPES.  
MONITORED PLACEMENT OF NATIVE SOIL PROTECTIVE COVER.  
MONITORED FINE GRADING PROTECTIVE COVER.  
MONITORED ACTIVITY INVOLVED IN FUSION WELDING OF THE FORCE MAIN.  
MONITORED PLACEMENT AND COMPACTION OF BACKFILL AT THE FORCE MAIN TRENCH

RECORD PREPARED BY:

 TED STILES

RECORD REVIEWED & APPROVED BY:

 DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

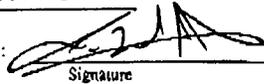
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-12-08

PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

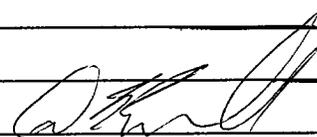
CONTRACTOR ACTIVITIES:

FUSION WELDING THE 6" X 10" DUAL CONTAINMENT FORCE MAIN IN THE TRENCH. THE 6" X 10" TEE WITH 2" X 4" REDUCER AND CHECK VALVE ASSEMBLY HAS BEEN FUSION WELDED AND SET IN PLACE.

THE 2" X 4" DUAL CONTAINMENT LINE AT THE EAST END (SUMP 12B) HAS BEEN CONNECTED TO THE 6" X 10" TEE. THE SWEEP 90° ANGLE IS IN PLACE AND THE 2" X 4" LINE IS STUBBED OUT AT THE TOP OF THE 24" RISER PIPE. (SOUTH SIDE OF THE SOUTHERN PIPE)

LIGHT RAIN BEGAN FALLING AT 3:30.

PLACEMENT AND COMPACTION OF BACKFILL IN THE 2" X 4" FORCE MAIN TRENCH.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

4 - 12 - 08

6" X 10" D.C. FORCE MAIN

6" X 10" D.C. FORCE MAIN

TOE OF SLOPE

TOP OF SLOPE

EXCAVATION FOREMAIN TRENCH

CHECK VALVE  
6" X 10" D.C. FORCE MAIN

2" X 4" STUB OUT

LEGEND  
PLACEMENT OF CLAYEY SOILS  
PLACEMENT OF NATURAL SOIL PROTECTIVE COVER

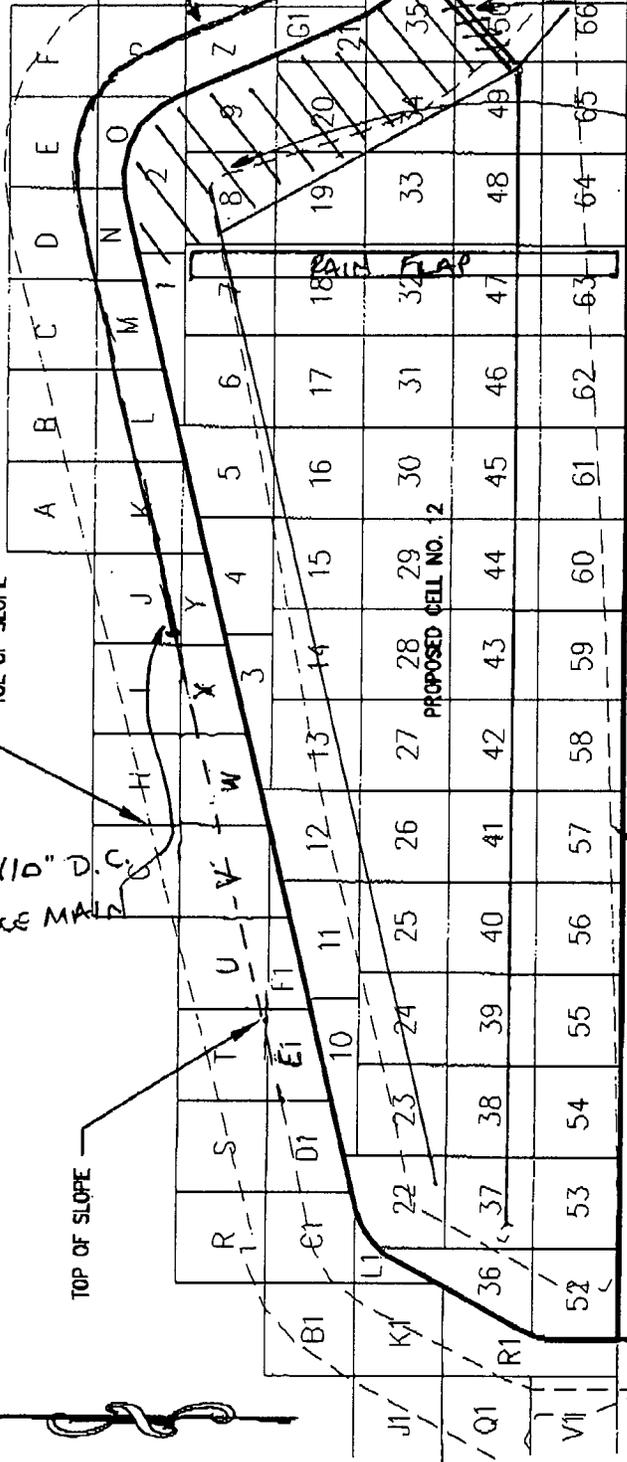
FINE GRADING

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26



EXISTING CELL NO. 11

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LNER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

FIGURE 1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL**  
BUNNELL-LAWMONS ENGINEERING, INC.  
6004 PONDERS CO. RD.  
CREDITVILLE, SOUTH CARO. 29615  
PHONE (843) 288-1265 FAX / 288-4430

DATE:	11-01-07
CAD:	ECL58-FSC12
JOB NO:	JD7-1001-58

AEH  
JAG  
NOVED:

PUNCH LIST SITE INSPECTION SCHEDULED FOR THURSDAY 4-17-08.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-13-08

PROJECT DAY NO. 16

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 5:30 PM

LUNCH BREAK: .5

WORK HOURS: 9.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
OVERCLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 59 °F  
DAYTIME HIGH: 68 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  COMPACTED CLAY LINER   
STRUCTURAL FILL  LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

OVERNIGHT RAIN FALL WAS MEASURED AT 0.3". PUMPING WATER FROM SUMPS 12 A AND 12 B.  
THE 24" RISER PIPES HAVE BEEN SET IN PLACE AT SWAMP 12 A.  
FUSION WELDING THE 6" X 10" DUAL CONTAINMENT FORCE MAIN PIPE.  
THE 6" X 10" TEE WITH 2" X 4" REDUCER HAS BEEN FUSED INTO PLACE.  
PLACEMENT OF #57 AND #78<sup>M</sup> STONE AT SWAMP 12A.  
FUSION WELDING THE 2" X 4" DUAL CONTAINMENT PIPE AT THE WEST END OF THE CELL.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ALL ACTIVITY INVOLVED IN SETTING THE 24" RISER PIPES IN PLACE.  
MONITORED FUSION OF 6" X 10" D.C. FORCEMAIN PIPE.  
MONITORED PLACEMENT OF DRAINAGE STONE AT SWAMP 12A.  
MONITORED FUSION OF 2" X 4" D.C. FORCEMAIN PIPE.  
MONITORED PLACEMENT AND COMPACTION OF BACKFILL AT THE 2" X 4" D.C. FORCEMAIN.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-13-08

PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

CONTRACTOR ACTIVITIES:

FINE GRADING AND CONSTRUCTION OF THE STORM WATER DIVERSION BERM AT THE EASTERN RAIN FLAP.

PLACEMENT AND COMPACTION OF BACKFILL AT THE 2" X 4" DUAL CONTAINMENT PIPE AT THE WEST END.

THE TWO 24" RISER PIPES AND THE TWO 8" SOLID CLEANOUT PIPES AT THE WEST END OF THE CELL HAVE BEEN CUT TO THE REQUIRED LENGTHS. (NOTE: THE THREADED CAPS HAVE NOT BEEN FUSED ON THE 8" SOLID PIPE. THE PRE-FABRICATED H.D.P.E. RINGS HAVE NOT BEEN EXTRUSION WELDED ON TO THE 24" RISER PIPES.)

PLACEMENT OF INITIAL BACKFILL ABOVE THE 6" X 10" DUAL CONTAINMENT FORCE MAIN PIPE.

TECHNICIAN ACTIVITIES:

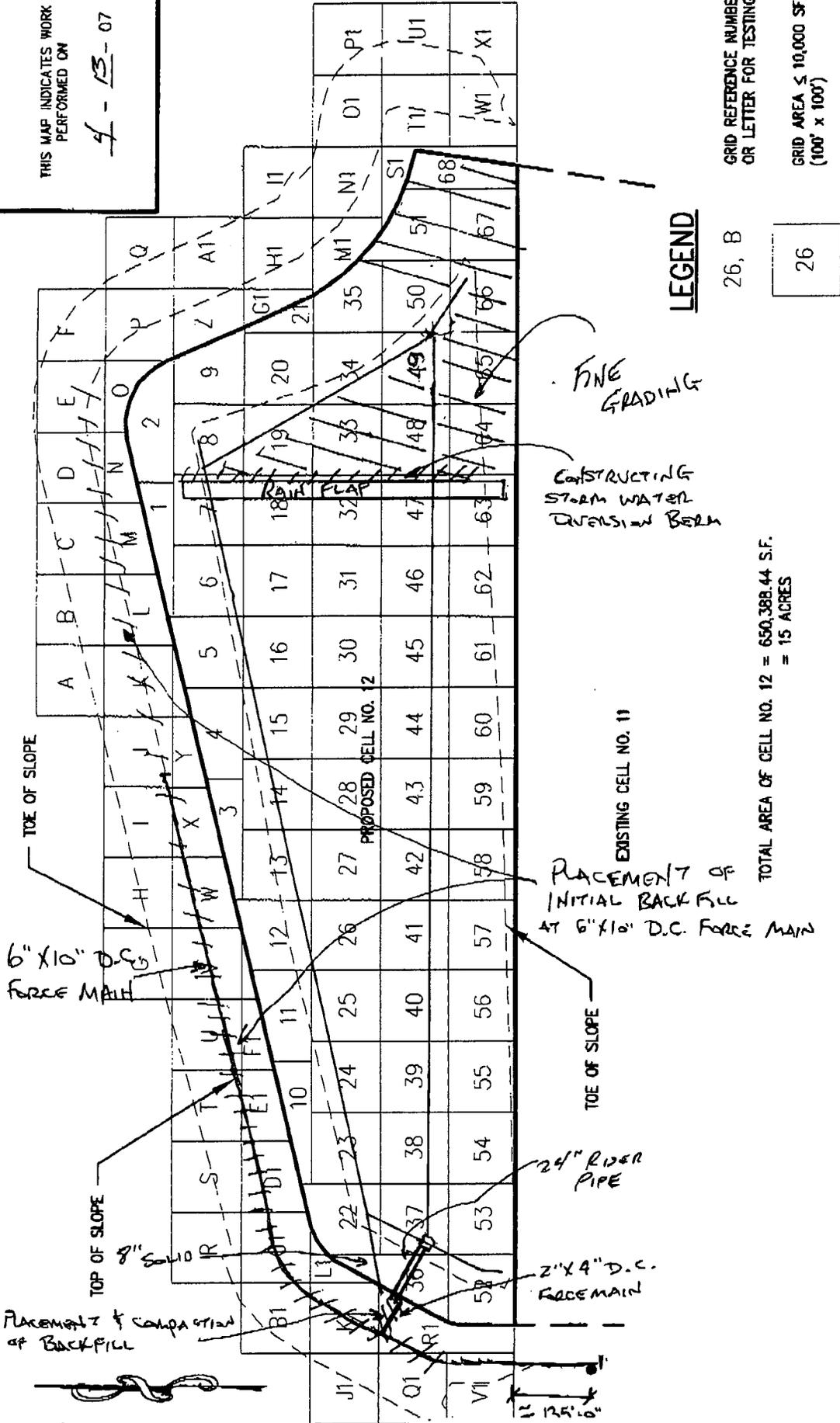
MONITORED PLACEMENT OF THE INITIAL BACKFILL AT THE 6" X 10" D.C. FORCE MAIN.

→ CQA/CONTRACTOR MEETING: BLE DRILLERS WILL BE ON SITE TUESDAY TO DRILL WELL GW-17. PLASTIC FUSION FABRICATORS REQUIRES A BACKER RING FOR THE FLANGE END TO CONNECT THEIR PLATE WITH THREADED PASSTHROUGH IN ORDER TO PERFORM THE HYDROSTATIC TEST ON THE FORCE MAIN. THE RING WILL BE ON SITE TUESDAY.

REVIEWED: 

THIS MAP INDICATES WORK PERFORMED ON

4-13-07



**LEGEND**

26, B  
GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA ≤ 10,000 SF (100' x 100')

26

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



NO:	AEH	DATE:	11-01-07	FIGURE	1
KEY:	JAG	CAD:	ECLF58-FSCCELL12	FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA	
REVISED:		JOB NO:	J07-1001-58		

**BLE**  
**BUNNELL-LAMBSON ENGINEERING, INC.**  
8004 POWERS CT  
 GREENVILLE SOUTH CARO 29615  
 PHONE: (864)228-1225 FAX: /228-4430

PUNCH LIST SITE MEETING ON THURSDAY 4-17-08.

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-14-08

PROJECT DAY NO. 162

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 6:00 PM

LUNCH BREAK: .5

WORK HOURS: 10.0

VISITORS:  
NAME REPRESENTING

ON-SITE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 39 °F  
DAYTIME HIGH: 59 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION  
STRUCTURAL FILL



COMPACTED CLAY LINER  
LEACHATE COLLECTION



CONTRACTOR ACTIVITIES:

THE EASTERN RAIN FLAP HAS BEEN SET IN PLACE. SECURED WITH PROTECTIVE COVER.  
FINE GRADING AND CONSTRUCTION OF STORM WATER DIVERSION BERMS.  
THE THREADED CAPS FOR THE LEACHATE CLEANOUTS HAVE BEEN INSTALLED WITH ELECTRO FUSION COUPLINGS.  
THE SECOND RAIN FLAP FROM THE EAST HAS BEEN SET IN PLACE AND SECURED WITH PROTECTIVE COVER MATERIAL.  
PLASTIC FUSION FABRICATORS HAVE DRILLED THE REQUIRED HOLE IN THE 24" RISER PIPES. THE STAINLESS STEEL FITTINGS, PVC CHECK VALVE

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED ALL ACTIVITY INVOLVED IN SETTING THE RAIN FLAPS INTO PLACE.  
MONITORED INSTALLATION OF ELECTROFUSION COUPLINGS AT THE LEACHATE CLEANOUTS.  
MONITORED ASSEMBLY AND INSTALLATION OF THE FORCE MAIN CONNECTIONS AT THE TOP OF THE 24" RISER PIPE. INSTALLATION OF THE PVC CHECK VALVES WITH RESPECT TO FLOW HAS BEEN VISUALLY

RECORD PREPARED BY:

Signature of Ted Stiles

TED STILES

RECORD REVIEWED & APPROVED BY:

Signature of Daniel B. Bunnell, P.E.

DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

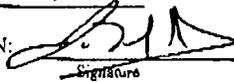
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-14-08

PAGE 2 OF 2

CQA TECHNICIAN:



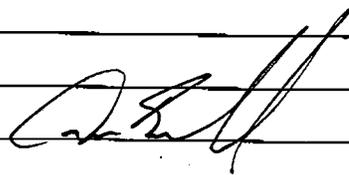
TED STILES

CONTRACTOR ACTIVITIES:

AND PVC BALL VALVE HAVE BEEN ASSEMBLED AND CONNECTED AT THE EAST AND WEST ENDS OF THE CELL. IT WILL BE NECESSARY TO DISCONNECT THE PVC BALL VALVE FROM THE PVC CHECK VALVE TO UTILIZE IT AS AN AIR RELEASE POINT FOR HYDROSTATIC TESTING OF THE FORCE MAIN.

TECHNICIAN ACTIVITIES:

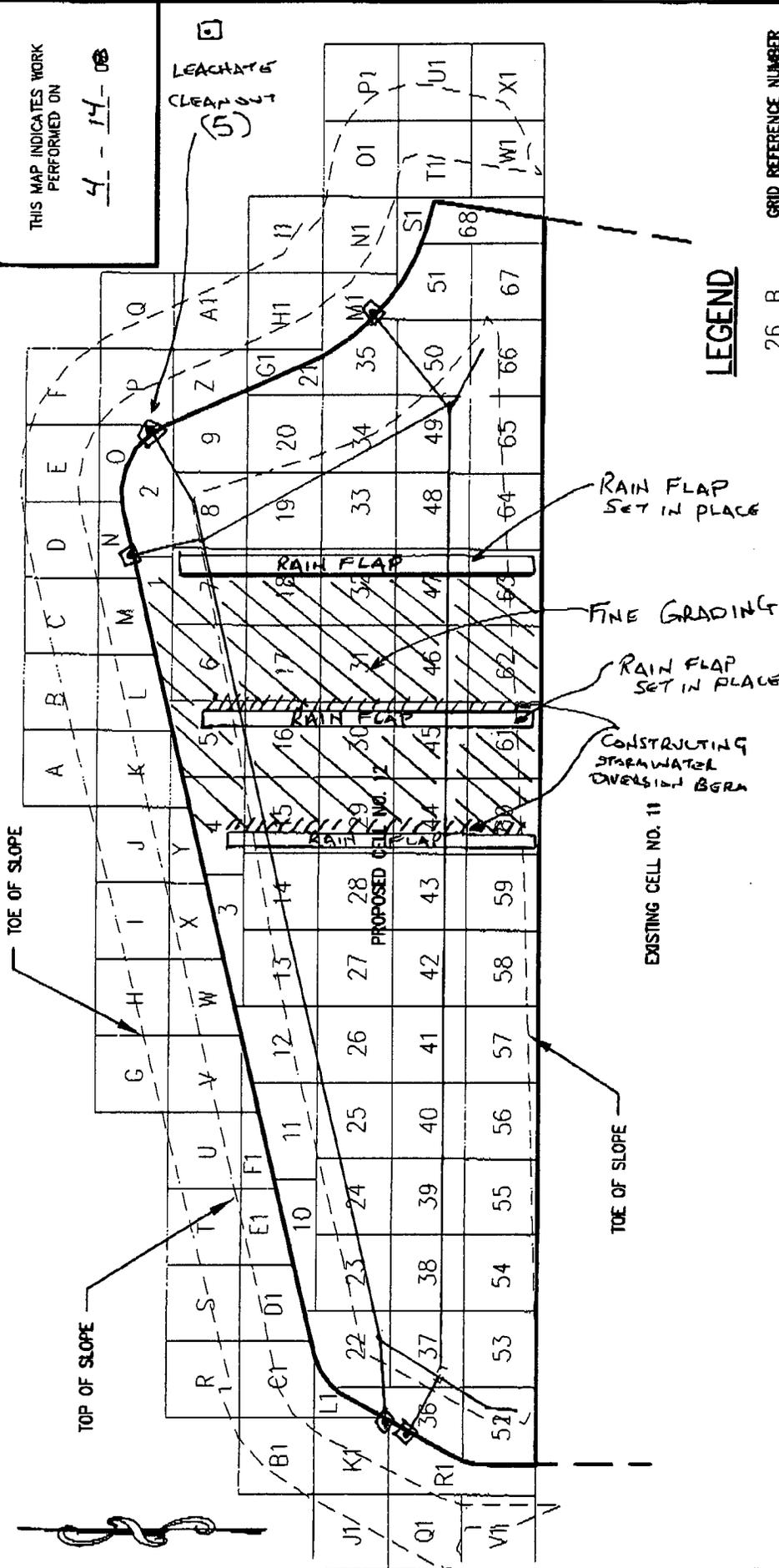
CONFIRMED TO BE CORRECT. PENETRATION OF THE 24" RISER PIPER HAS BEEN MADE TO THE SOUTHERN SIDE OF THE SOUTHERN PIPE AT THE TOP OF BOTH SUMP 12A AND 12B.



THIS MAP INDICATES WORK PERFORMED ON

4-14-08

LEACHATE CLEANOUT (5)



**LEGEND**

26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING

GRID AREA  $\leq 10,000$  SF ( $100' \times 100'$ )

26

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,398.44 S.F. = 15 ACRES



DATE:	11-01-07
ED:	JAG
JOB NO:	J07-1001-58
FIGURE	1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBL** INC.  
BUNNELL-LANFONG ENGINEERING, INC.  
8004 POWERS CO"  
GREENVILLE, SOUTH CARO 28615  
PHONE: (864)288-1285 FAX: /288-4430

**RECORD OF DAILY OBSERVATIONS**  
**CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12**  
**EAST CAROLINA REGIONAL RECYCLING COMPLEX**  
**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4.15.08

PROJECT DAY NO. 163

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 8:00 PM

LUNCH BREAK: .5

WORK HOURS: 12.0

VISITORS:  
 NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: <sup>AM</sup> SUNNY CLOUDY WINDY  
<sub>PM</sub> PLY CLOUDY RAIN

TEMPERATURE:  
 MORNING LOW: 39 °F  
 DAYTIME HIGH: 61 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

**SITE ACTIVITIES:**

SUBGRADE PREPARATION   
 STRUCTURAL FILL

COMPACTED CLAY LINER   
 LEACHATE COLLECTION

**CONTRACTOR ACTIVITIES:**

THE CENTER RAIN FLAP HAS BEEN SET INTO PLACE AND SECURED WITH PROTECTIVE COVER MATERIAL.

FINE GRADING AND CONSTRUCTION OF THE STORM WATER DIVERSION BERM.

BLE DRILLERS ARE ON SITE DRILLING MONITORING WELL GW-17.

PLASTIC FUSION FABRICATORS IS ON SITE EXTRUSION WELDING THE HDPE RINGS ON TO THE TOP END OF THE 24" RISER PIPES.

THE TWO WESTERN MOST RAIN FLAPS HAVE BEEN SET INTO PLACE

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

**TECHNICIAN ACTIVITIES:**

MONITORED ALL ACTIVITY INVOLVED IN SETTING THE RAIN FLAPS INTO PLACE.

MONITORED INSTALLATION OF THE H.D.P.E. RINGS ON THE 24" RISER PIPE.

MONITORED ACTIVITY INVOLVED IN FILLING THE 6" FORCE MAIN WITH WATER AND RELEASING THE TRAPPED AIR.

RECORD PREPARED BY:

Ted Stiles Signature TED STILES

RECORD REVIEWED & APPROVED BY:

Daniel B. Bunnell Signature DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

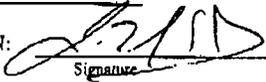
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-15-08

PAGE 2 OF 2

CQA TECHNICIAN:

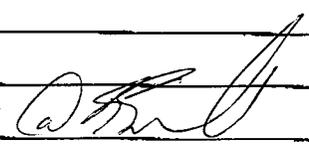
  
Signature

TED STICES

CONTRACTOR ACTIVITIES:

AND SECURED WITH PROTECTIVE COVER MATERIAL.

BEGAN FILLING THE 6" FORCE MAIN PIPE WITH WATER AT 3:45.  
AT 7:00 THE PIPE WAS STILL RELEASING AIR AND NOT BUILDING  
PRESSURE. THE PIPE WAS SEALED OFF AND THE PROCESS WILL BEGID  
AGAIN IN THE MORNING.

Reviewed: 

THIS MAP INDICATES WORK PERFORMED ON

4-15-08

INSTALLED 11-20-03  
GW-16P

FILLING 6" PIPE W/ WATER AND PERFORMING HYDROSTATIC TEST FROM THIS G.W.O.

CHECK VALUE OF 6"x10" D.C. FORCE MAIN

**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING  
26, B

GRID AREA S 10,000 SF (100' x 100')  
26

**REFERENCE:**

DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

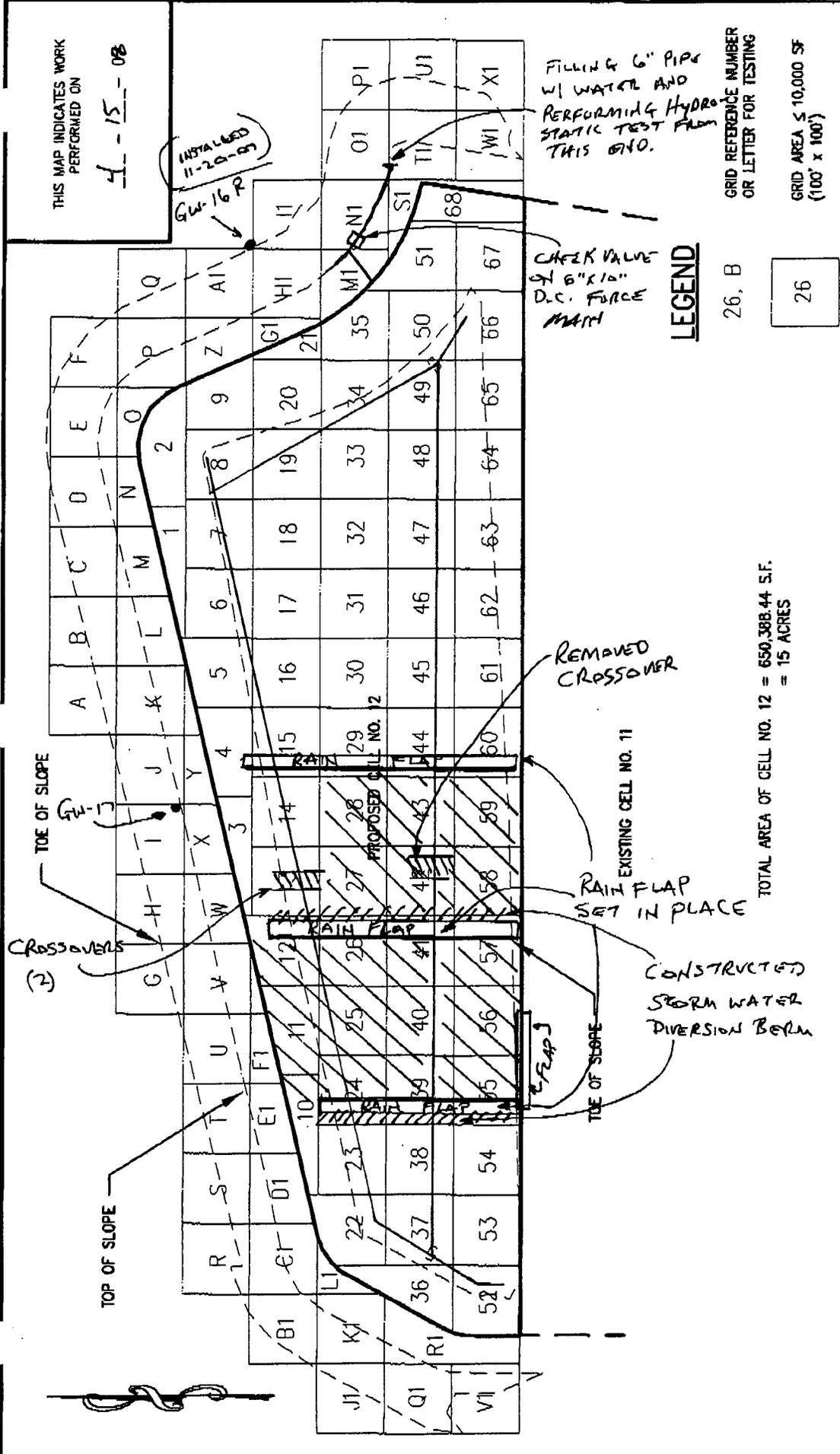
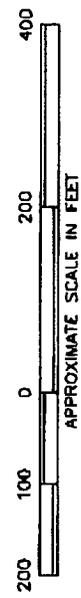
FIGURE  
**1**

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**IBLE**  
BUNNELL-LAMBSON ENGINEERING, INC.  
6004 FONDERS CO.  
GREENVILLE SOUTH CAR.  
19515  
PHONE (864)288-1285 FAX /288-4430

DATE:	11-01-07
CAD:	ECLF58-FSC0112
JOB NO.:	J07-1001-58

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
= 15 ACRES



RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-16-08

PROJECT DAY NO. 164

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 7:00 PM

LUNCH BREAK: .5

WORK HOURS: 11.0

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

TOMMY FIELDS PLS  
WRIGHT, FIELDS L.S.

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 36 °F  
DAYTIME HIGH: 66 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

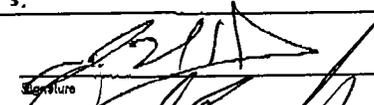
CONTRACTOR ACTIVITIES:

FINE GRADING PROTECTIVE COVER.  
EXCAVATION OF THE DITCH NORTH AND WEST OF THE CELL. THIS MATERIAL IS BEING PLACED ON THE CELL BERM AS NEEDED AND THE EXCESS IS BEING PLACED IN VARIOUS AREAS OF THE ACCESS ROAD.  
PLASTIC FUSION FABRICATORS IS ON SITE PERFORMING THE HYDROSTATIC PRESSURE TEST ON THE 6" FORCE MAIN PIPE AND THE AIR PRESSURE TEST ON THE 10" SECONDARY CONTAINMENT PIPE.  
TOMMY FIELDS IS ON SITE PERFORMING THE PROTECTIVE COVER ASBUILT.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

DEVELOPING GROUND WATER MONITORING WELL GW-17.  
MONITORED START UP OF THE FORCE MAIN AND SECONDARY CONTAINMENT PIPE PRESSURE TESTS. PERFORMED RANDOM CHECKS ON THE GAUGES DURING THE TESTS. CONFIRMED GAUGE READING AT THE END OF THE TESTS. THE PRESSURE TESTS HAVE BEEN PERFORMED IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.

RECORD PREPARED BY:  TED STILES

RECORD REVIEWED & APPROVED BY:  DANIEL B. BUNNELL, P.E.

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-16-08

PAGE 2 OF 2

CQA TECHNICIAN:



Signature

TED STILES

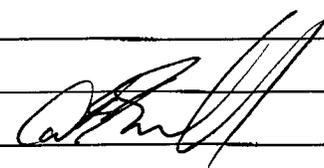
CONTRACTOR ACTIVITIES:

PLASTIC FUSION FABRICATORS HAS MADE THE NECESSARY PENETRATION AT MANHOLE #11 FOR THE FORCE MAIN CONNECTION. INVERT ELEVATION OF THE PENETRATION IS 68.20. THE 10" SECONDARY CONTAINMENT PIPE HAS BEEN CAPPED AT M.H. #11. THE 6" CONTAINMENT PIPE HAS A 90° ELBOW WHICH EXTENDS APPROXIMATELY 16" INTO THE MANHOLE.

EAST CAROLINA LANDFILL PERSONNEL WERE RESPONSIBLE FOR OPERATION OF THE VALVES AT MANHOLE #11 IN COORDINATION WITH THE INSTALLATION OF THE FORCE MAIN. ALL VALVES ARE CURRENTLY OPEN.

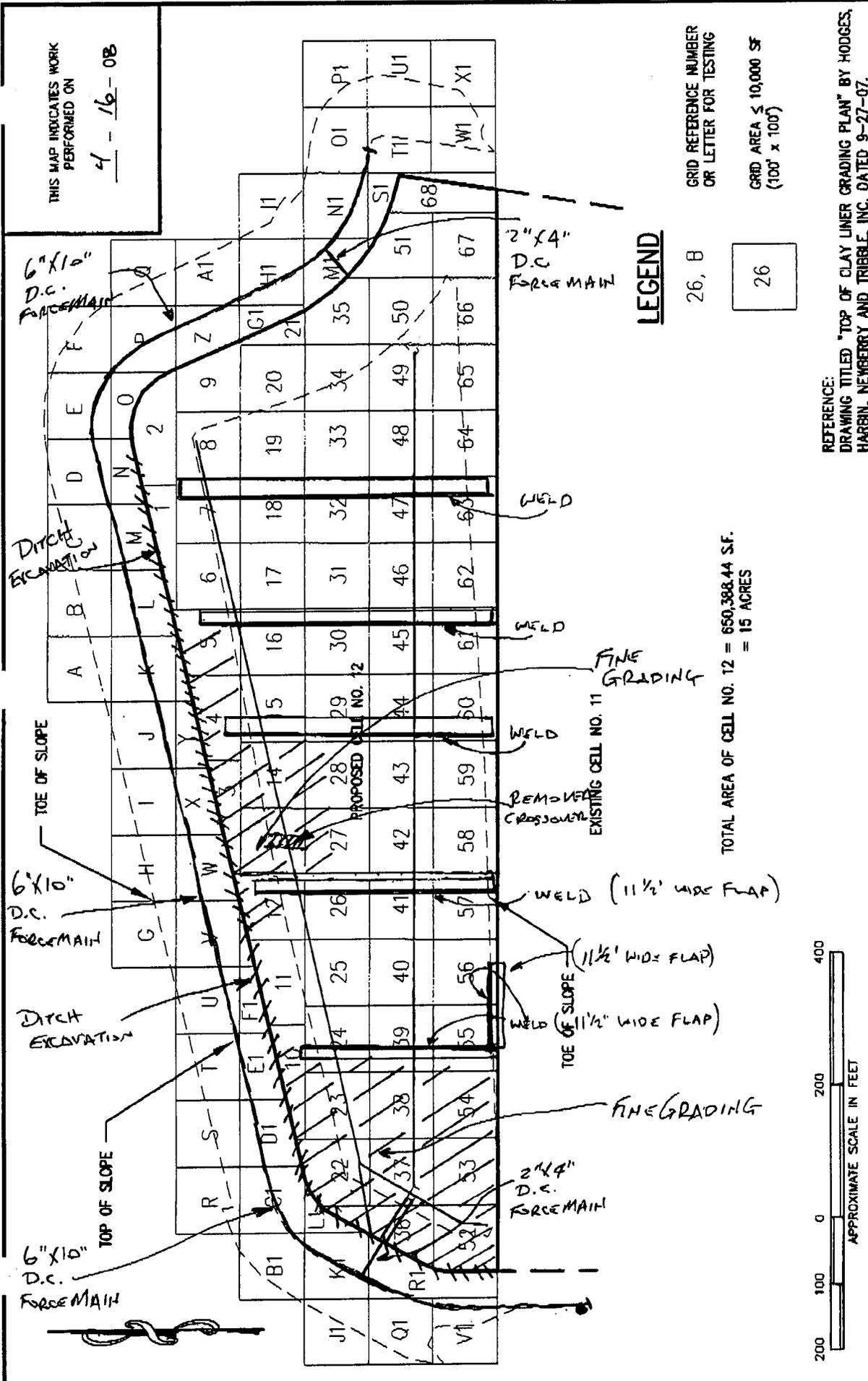
TECHNICIAN ACTIVITIES:

MONITORED ALL ACTIVITY INVOLVED IN THE INSTALLATION OF THE FORCE MAIN AT MANHOLE #11.

Received: 

THIS MAP INDICATES WORK PERFORMED ON

4-16-08



**LEGEND**

- 26, B      GRID REFERENCE NUMBER OR LETTER FOR TESTING
- 26      GRID AREA  $\leq 10,000$  SF (100' x 100')

REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

TOTAL AREA OF CELL NO. 12 = 650,388.44 SF. = 15 ACRES



DATE	11-01-07
CAD	EQIF58-FSC112
JOB NO	J07-1001-58
FIGURE	1

FIELD SKETCH - CELL NO. 12  
EAST CAROLINA LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

**BLE**  
BUNNELL-LAMMONS ENGINEERING, INC.  
6004 FONDERS COURT  
GREENVILLE, SOUTH CAROLINA 29615  
PHONE: (864) 238-1285 FAX: /238-4430

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-17-08

PROJECT DAY NO. 165

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 4:00 PM

LUNCH BREAK: .5

WORK HOURS: 8.0

VISITORS:

NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

DAN BUNNELL, P.E.

TOMMY FIELDS, PLS/WRIGHT  
& FIELDS

WEATHER: SUNNY CLOUDY WINDY  
PARTLY CLOUDY RAIN

TEMPERATURE:  
MORNING LOW: 37 °F  
DAYTIME HIGH: 75 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

TOMMY FIELDS IS ON SITE, COMPLETED AS BUILT ON THE PROTECTIVE COVER.

EXCAVATION OF THE DITCH EAST OF THE CELL. THE EXCAVATED MATERIAL IS BEING PLACED AND COMPACTED ABOVE THE FORCE MAIN.

PERFORMING GRADE CORRECTIONS ON THE PROTECTIVE COVER AS NEEDED.

EAST CAROLINA LANDFILL PERSONNEL HAVE SET THEIR PUMPS IN PLACE AT THE RAIN TRAPS ALONG THE SOUTHERN LEACHATE LINE.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

DEVELOPING THE GROUND WATER MONITORING WELL GW-17.

MONITORED PLACEMENT AND COMPACTION OF BACKFILL ALONG THE FORCE MAIN.

PERFORMED PUNCH LIST ON CELL CONSTRUCTION, ACCESS ROAD CONSTRUCTION AND TRIPP PROPERTY BORROW AREA. PUNCH LIST ITEMS HAVE BEEN SUBMITTED SEPARATELY.

RECORD PREPARED BY:

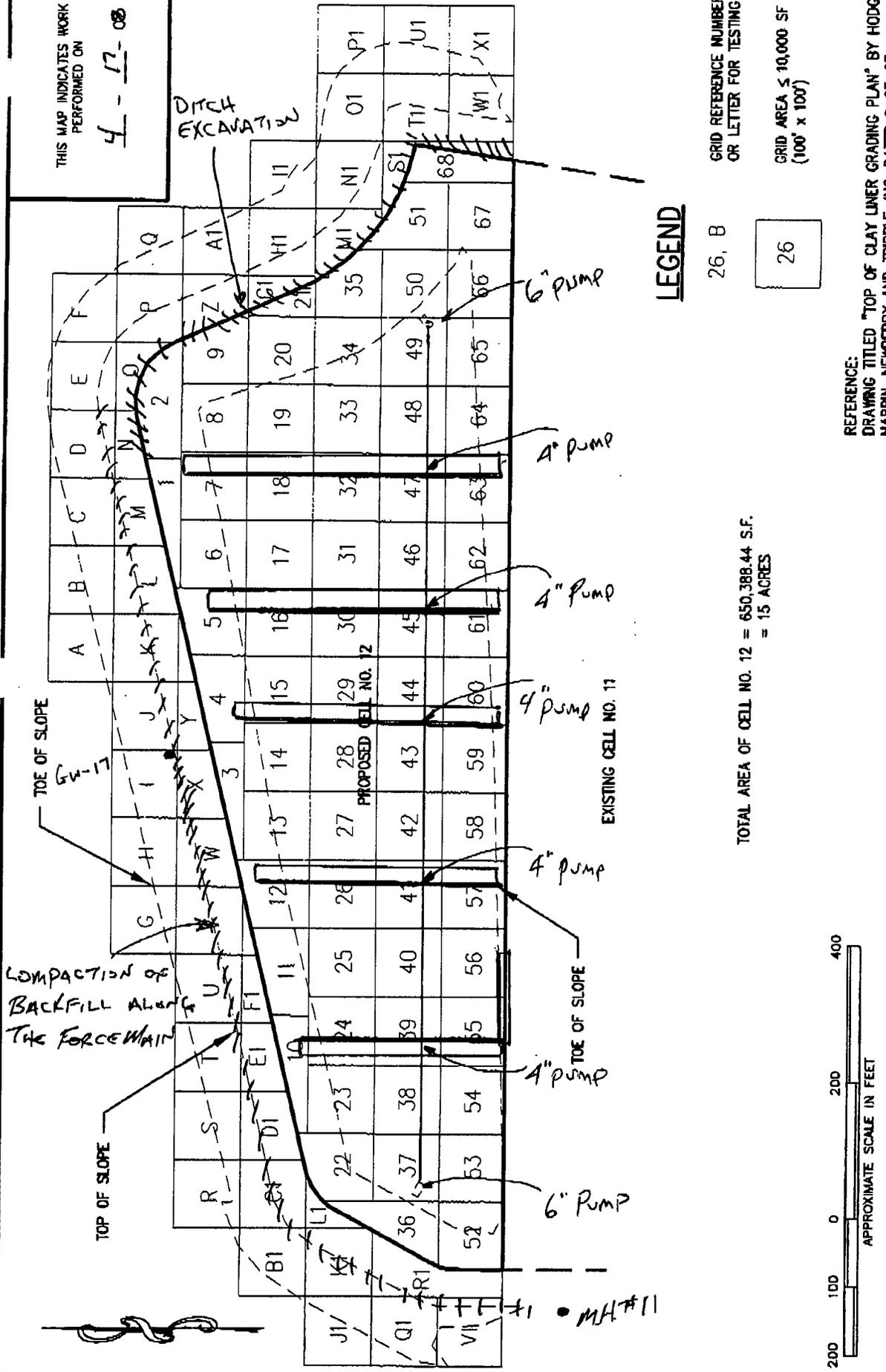
TED STILES  
Signature

RECORD REVIEWED & APPROVED BY:

DANIEL B. BUNNELL, P.E.  
Signature

THIS MAP INDICATES WORK PERFORMED ON

4-17-08



**LEGEND**

GRID REFERENCE NUMBER OR LETTER FOR TESTING

26, B

GRID AREA  $\leq 10,000$  SF (100' x 100')

26

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE:  
DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

RAWN: AEH	DATE: 11-01-07	FIGURE: 1
CHECKED: JAG	CAD: ECLF58-FSC112	
APPROVED:	JOB NO: J07-1001-58	
<p><b>BLE</b> INC. BUNNELL-LAMMONS ENGINEERING, INC. 6004 POWERS CO. GREENVILLE, SOUTH CAROLINA 29615 PHONE: (864)286-1265 FAX: /286-4430</p>		<p>FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA</p>

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-18-88

PROJECT DAY NO. 166

ARRIVAL TIME: 8:00 AM

DEPARTURE TIME: 4:30 PM

LUNCH BREAK: .5

WORK HOURS: 8.0

VISITORS:  
NAME REPRESENTING

ONSITE PERSONNEL: TED STILES

WEATHER:  SUNNY  CLOUDY  WINDY  
 PTLY CLOUDY  RAIN

TEMPERATURE:  
MORNING LOW: 45 °F  
DAYTIME HIGH: 85 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION   
STRUCTURAL FILL

COMPACTED CLAY LINER   
LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

PLACEMENT AND COMPACTION OF BACKFILL ABOVE THE FORCE MAIN EAST OF THE CELL.

REGRADING AND PLACEMENT OF TOPSOIL AT THE TOP OF THE EXTERIOR SLOPE OF THE ACCESS ROAD.

DRAGGING THE HAUL ROAD, TRIPP PROPERTY BORROW AREA AND WASHED PROTECTIVE COVER STOCKPILE AREA (NORTH OF CELL 12) WITH A BOX BLADE.

PLACEMENT OF PIPE AT THE RISER PIPE AND LEACHATE CLEAN OUTS.

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED PLACEMENT AND COMPACTION OF BACKFILL ABOVE THE FORCE MAIN. PERFORMED DRIVE CYLINDER DENSITY TESTS AT SUBGRADE.

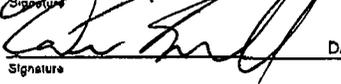
DEVELOPED MONITORING WELL GW-17.

RECORD PREPARED BY:



TED STILES

RECORD REVIEWED & APPROVED BY:

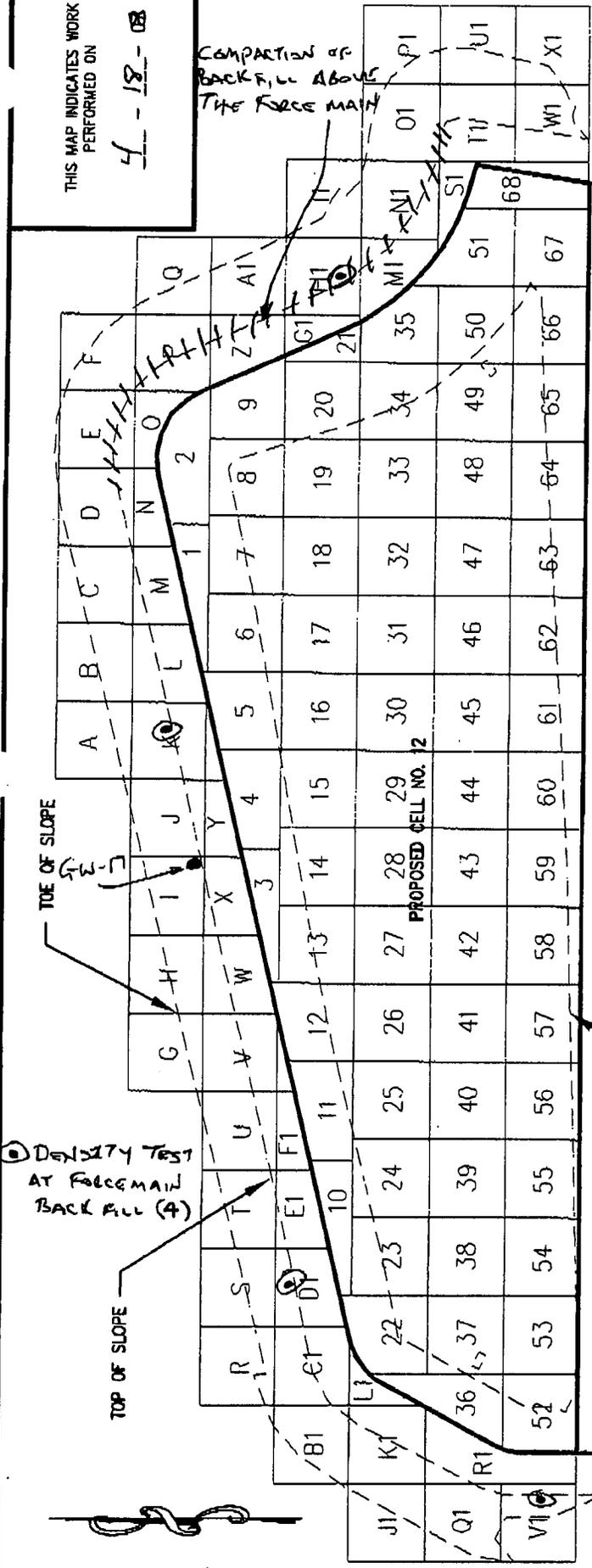


DANIEL B. BUNNELL, P.E.

THIS MAP INDICATES WORK PERFORMED ON

4-18-08

COMPARISON OF BACKFILL ABOVE THE FORCE MAIN



**LEGEND**

- 26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING
- 26 GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

RAWN:	AEH	DATE:	11-01-07
CHECKED:	JAG	CAD:	ECIF58-FSCCELL12
APPROVED:		JOB NO.:	J07-1001-58

**IBL**  
**RUSSELL-LANBORN ENGINEERING, INC.**  
 5004 FORDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1

RECORD OF DAILY OBSERVATIONS - ADDITIONAL COMMENTS

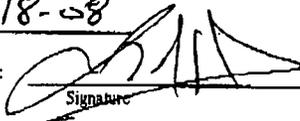
CONSTRUCTION QUALITY ASSURANCE - CELL 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 4-18-08

PAGE 2 OF 2

CQA TECHNICIAN:

  
Signature

TED STILES

REMAINING MATERIALS LIST.

PIPE

6" SOLID SDR 11 58'

10" SOLID SDR 17 106'

4" PERFORATED SDR 11 130'

8" PERFORATED SDR 11 78'

8" SDR 11 CAP - 1

6" ELECTROFUSION COUPLING - 2

STONE

#57 STONE  $\approx$  40 TON

#78 STONE  $\approx$  300 TON

FML

TEXTURED - LARGE PARTIAL HT1-6-07-7547-5

\* SMOOTH - FULL ROLL HS2-6-07-1297-5 \*

\* SMOOTH - SMALL PARTIAL HS2-6-07-1294-5 \*

\* - RAINFLAP / RUBSHEET MATERIAL - NOT APPROVED FOR CONTAINMENT

GCL

FOUR FULL ROLLS - 1259, 1260, 1261, 1263

RECORD OF DAILY OBSERVATIONS

CONSTRUCTION QUALITY ASSURANCE - CELL NO. 12  
EAST CAROLINA REGIONAL RECYCLING COMPLEX  
BERTIE COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CLIENT: HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

DATE: 4-19-08

PROJECT DAY NO. 167

ARRIVAL TIME: 7:30 AM

DEPARTURE TIME: 3:00 PM

LUNCH BREAK: -

WORK HOURS: 7.5

VISITORS:

NAME REPRESENTING

ONSITE BLE PERSONNEL: TED STILES

WEATHER: SUNNY CLOUDY WINDY

PLY CLOUDY

RAIN

TEMPERATURE:

MORNING LOW: 54 °F

DAYTIME HIGH: 82 °F

EQUIPMENT SEE WEEKLY EQUIPMENT LIST

SITE ACTIVITIES:

SUBGRADE PREPARATION

STRUCTURAL FILL

COMPACTED CLAY LINER

LEACHATE COLLECTION

CONTRACTOR ACTIVITIES:

GRADING THE IN PLACE FILL IN THE ACCESS ROAD AS FINISHED GRADE.  
PLACEMENT AND COMPACTION OF THE GRADED EXCESS AS NEEDED TO OBTAIN  
ADEQUATE DRAINAGE.

PLACEMENT OF TOPSOIL IN THE DITCH AROUND CELL 12.

GRADING EXTERIOR SLOPE OF THE ACCESS ROAD.

AGG IS ON SITE. THEY HAVE COMPLETED THE REPAIR AT THE  
NORTH END OF THE WESTERN RAINFLAP. AND WELDING THE RAINFLAP  
PANELS. (ON SITE 10:30 - 2:30)

QUADRANT LOCATIONS: SEE ATTACHED SKETCH AND OR DENSITY TEST WORKSHEET

TECHNICIAN ACTIVITIES:

MONITORED COMPACTION OF FILL IN THE ACCESS ROAD. PERFORMED DRIVE  
CYLINDER DENSITY TESTS.

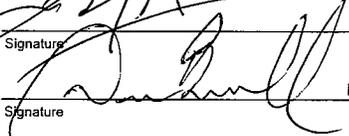
PERFORMED CQA ON GEMEMBRANE REPAIR AND MONITORED  
ACTIVITY ON WELDING THE RAINFLAP PANELS.

RECORD PREPARED BY:

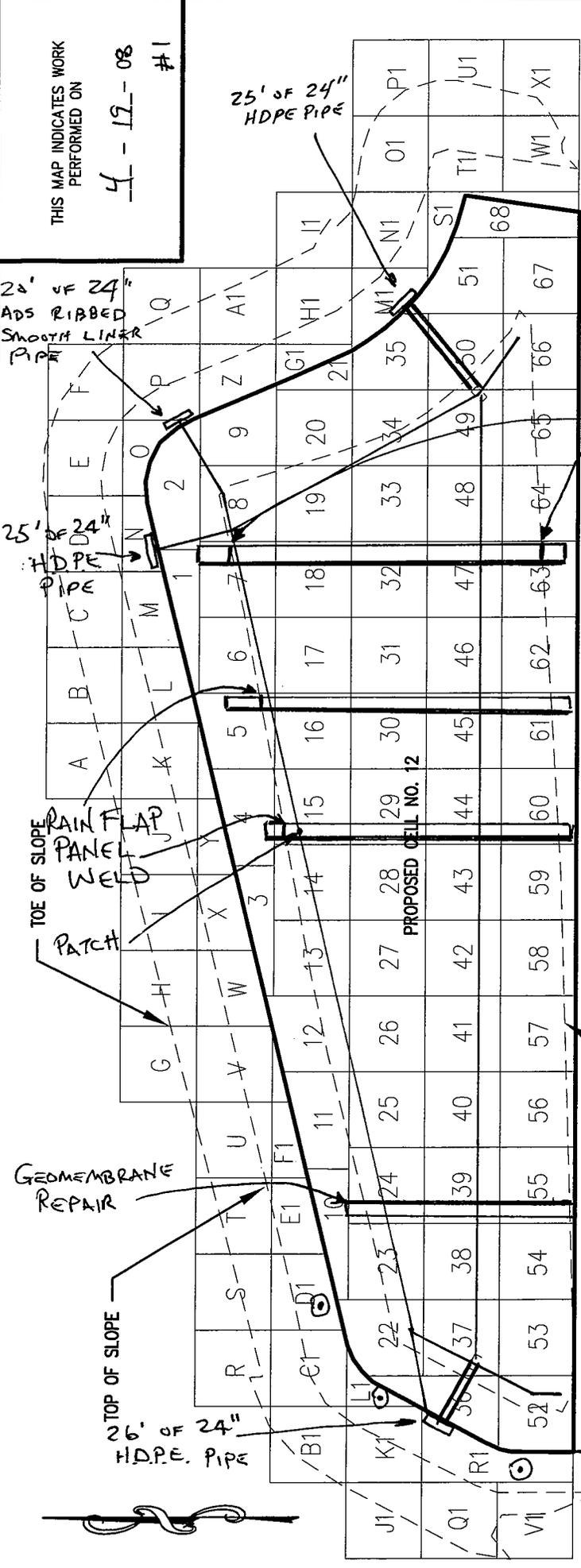


TED STILES

RECORD REVIEWED & APPROVED BY:



DANIEL B. BUNNELL, P.E.



THIS MAP INDICATES WORK PERFORMED ON  
 4-19-08  
 #1

GRID REFERENCE NUMBER OR LETTER FOR TESTING  
 26, B  
 GRID AREA ≤ 10,000 SF (100' x 100')

**LEGEND**

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F.  
 = 15 ACRES



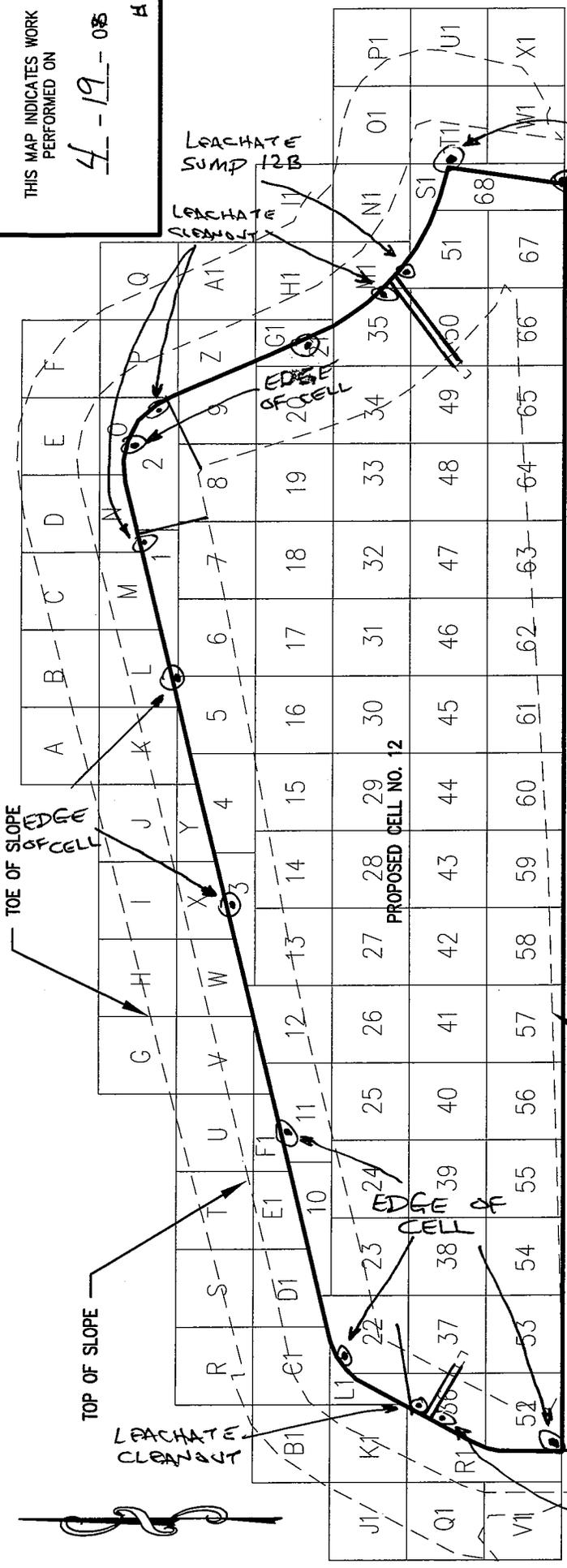
REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 11-01-07	 <b>BUNNELL-LAMMONS ENGINEERING, INC.</b> 6004 PONDERS CO. GREENVILLE, SOUTH CAR. PHONE: (864)288-1265 FAX: /288-4430	FIGURE
CHECKED: JAG	CAD: ECLF58-FSC112		FIELD SKETCH - CELL NO. 12 EAST CAROLINA LANDFILL BERTIE COUNTY, NORTH CAROLINA
APPROVED:	JOB NO: J07-1001-58		

THIS MAP INDICATES WORK PERFORMED ON

4-19-08

A2



LOCATIONS & NARRATIVES MARKED BY BLE FOR MARKER POST PLACEMENT

**LEGEND**

- 26, B GRID REFERENCE NUMBER OR LETTER FOR TESTING
- 26 GRID AREA ≤ 10,000 SF (100' x 100')

TOTAL AREA OF CELL NO. 12 = 650,388.44 S.F. = 15 ACRES



REFERENCE: DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DATE:	11-01-07
CAD:	ECLF58-FSCCELL12
JOB NO:	J07-1001-58
DRAWN:	AEH
CHECKED:	JAG
APPROVED:	

**BLE INC.**  
**BUNNELL-LAMMONS ENGINEERING, INC.**  
 6004 PONDERS COIL RD.  
 GREENVILLE, SOUTH CARO 29615  
 PHONE: (864)288-1285 FAX: 288-4430

FIELD SKETCH - CELL NO. 12  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA



**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

**RECORD OF PUNCH LIST INSPECTION**  
**CONSTRUCTION OF CELL NO. 12**  
**EAST CAROLINA REGIONAL MSW LANDFILL**  
**BERTIE COUNTY, NORTH CAROLINA**  
**BLE Project No. J07-1001-58**

**Date of Punch List:** April 17, 2008  
**Updated:** April 25, 2008

**Site Visit by:** Daniel B. Bunnell, P.E.                      Bunnell-Lammons Engineering, Inc.  
Mitch Hoggard    East Carolina Regional MSW Landfill  
Ted Stiles    Bunnell-Lammons Engineering, Inc.  
Timmy Lee    R.B. Baker Construction Company, Inc.

**Weather Conditions:** Sunny, high mid-70's

**Project Status:** Protective Cover Completion

---

Cell No. 12, Borrow Pit No. 9 and the Tripp Borrow Area were observed. The following items remained to be completed at the project site as of April 17, 2008. (Items completed as noted.)

**A. Cell No. 12:**

1. Wright and Fields Land Surveying was in the process of performing the top of protective cover as-built survey. The slope at the west end of the cell had been rough graded and required fine grading. This area will be fine graded and final as-built survey data obtained by the end of today. The top of protective cover sands had been fine graded over the remaining portions of the cell. **The Top of Protective Cover As-built Survey is complete.**
2. American Environmental Group, Ltd. (AEG) is to repair the tear in the base liner at the rainflap. In addition, the two eastern most rainflaps had areas that require seaming after the rainflaps had been stood up (total four welds). AEG is scheduled to arrive on Saturday (April 19, 2008) to perform this work. **The tear and rainflaps were repaired and welded on April 19, 2008.**
3. Pump and panel installation. Gunn Co is scheduled for arrival on Tuesday, April 22, 2008. **The pumps and panels are installed.**

**B. Leachate Collection System:**

1. Complete backfill over forcemain along north access road and west access road to Manhole No. 11. **Completed April 19, 2008.**

**OBSERVATIONS:**

The Cell No. 12 area, Borrow Area No. 9 and the Tripp Borrow Area were each observed. Cell No. 12 was traversed on foot along the Access Road, the tie-in with Cell No. 11 and each of the rainflaps. The rainflaps were each noted to be properly installed with No. 57 and No. 78M stone in place for use by the landfill to form the tie-in when the rainflaps are taken out of service. Also, it was noted that the 10-inch diameter slip joint coupling pipes were in place. Each provided with a strap to allow the landfill to easily slide the pipe and make the connection at the leachate line when the rainflaps are taken out of service. The clean fine to coarse,  $k \leq 1 \times 10^{-2}$  cm/s sands were noted to be in place in accordance with the design plans around each of the sump locations. The native protective cover sands had been fine graded and consisted of a light tan fine to coarse sand.

In summary, the construction of Cell No. 12 was substantially completed on April 19, 2008. The items observed as completed were in conformance with the project plans, specifications and the CQA Manual. Numerous thickness checks had been performed in the protective cover sands confirming the presence of more than 2 feet of protective cover sand. In addition, the thickness of the drainage stone was confirmed at several locations at the request of Dan Bunnell, P.E. utilizing R.B. Baker's GPS survey equipment.

Respectively submitted by:



Daniel B. Bunnell, P.E.  
Project CQA Engineer  
Registered, NC No. 13814

s/l/e



Distribution: Bill Hodges, P.E.  
Ray Hoffman, P.E.  
Mitch Hoggard  
Steve Nichting  
Matt Cheek, P.E.  
Jeff Helvey, P.E.

**APPENDIX C**  
**PHOTOGRAPHS**



Photo No. 1: Placing structural fill soils hauled from the designated borrow area to Cell No. 12 using articulated off-road haul trucks.



Photo No. 2: Spreading a lift of structural fill soils using a CAT D-6 dozer.



Photo No. 3: Compacting a lift of structural fill soils using a vibratory smooth drum roller.



Photo No. 4: Moisture addition to a lift of clay liner soil prior to processing.



Photo No. 5: Processing a lift of compacted clay liner using disc harrows.



Photo No. 6: Compacting a lift of clay liner using a CAT 815 sheepfoot compactor.



Photo No. 7: Smooth drum rolling a lift of compacted clay liner after initial compaction was completed using a CAT 815 sheepsfoot compactor.



Photo No. 8: Smooth drum rolling the top (4<sup>th</sup>) lift of the compacted clay liner to provide a smooth surface finish prior to geomembrane deployment.



Photo No. 9: Fine grading the clay liner surface using a GPS-equipped D-6 dozer.



Photo No. 10: Deploying a geomembrane panel over the completed clay liner.



Photo No. 11: Welding adjacent panels of geomembrane using a double track fusion welding machine.



Photo No. 12: Performing an air pressure test on a double fusion weld.



Photo No. 13: A seam destructive sample location marked in the field by the CQA technician.



Photo No. 14: "Leistering" a repair patch in preparation for grinding.



Photo No. 15: Grinding a repair patch in preparation for extrusion welding.



Photo No. 16: Extrusion welding a repair patch.



Photo No. 17: Vacuum box testing an extrusion weld.



Photo No. 18: Installing the GCL layer in the leachate sump.



Photo No. 19: Deploying the minimum 6-osy separation geotextile in the cell floor.



Photo No. 20: Deploying the 24-osy cushion geotextile for the leachate collection line pipe and stone.



Photograph No. 21: Installing the 8-inch diameter perforated HDPE leachate collection line and the 4-inch diameter perforated HDPE supplemental leachate collection lines.



Photograph No. 22: Installing and spot checking elevations on the No. 57 leachate collection stone.



Photo No. 23: Placing native soil protective cover on the Entrance Ramp / Access Road for Cell No. 12.



Photo No. 24: Spreading native soil protective cover to form the haul road in Cell No. 12.



Photo No. 25: Placing and spreading the washed sand protective cover in areas indicated in the project documents.



Photo No. 26: Hydrostatic pressure testing the 6" x 10" dual contained HDPE force main.



Photograph No. 27: Completed Cell No. 12.

# **APPENDIX D**

## **LABORATORY TEST RESULTS**

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**SUMMARY OF STANDARD PROCTOR TEST RESULTS – SUBGRADE AND STRUCTURAL FILL**

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- **ATTERBERG LIMITS TEST REPORTS**
- **STANDARD PROCTOR TEST REPORTS**
- **HYDRAULIC CONDUCTIVITY TEST REPORTS**

**SUMMARY OF UNDISTURBED SAMPLES HYDRAULIC CONDUCTIVITY TEST RESULTS**

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**SUMMARY OF TEST RESULTS – NATIVE SOIL PROTECTIVE COVER**

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- **PARTICLE SIZE DISTRIBUTION REPORTS**
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**SUMMARY OF TRIPP PROPERTY BORROW AREA TEST RESULTS (PERFORMED IN 2005)**

**SUMMARY OF PROCTORS - STRUCTURAL FILL  
CONSTRUCTION OF CELL NO. 12**

**CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58**

SAMPLE DESIGNATION	STANDARD PROCTOR PARAMETERS (ASTM D 698)	
	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
SF-1-C11	114.5	14.5
SF-2-C11	108.7	17.3
SF-4-C11	111.5	11.1
P-4-4	104.9	19.5
TP-5-C9	99.2	21.5
CLSP-2-C12	105.7	18.0

**SUMMARY OF PROCTORS - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

**CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58**

<b>SAMPLE DESIGNATION</b>	<b>STANDARD PROCTOR PARAMETERS (ASTM D 698)</b>	
	<b>MAXIMUM DRY DENSITY (PCF)</b>	<b>OPTIMUM MOISTURE CONTENT (%)</b>
<b>TP-5</b>	<b>100.1</b>	<b>19.9</b>
<b>CLSP-2-C12</b>	<b>105.7</b>	<b>18.0</b>
<b>CLSP-3-C12</b>	<b>102.6</b>	<b>20.4</b>

**SUMMARY OF CQA CONFORMANCE TESTING - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-59

Cell No. 12 = 651,000 sq ft (15 Acres) = 48,177 cy Clay Liner

TEST METHOD	REQUIRED FREQUENCY	REQUIRED NUMBER OF TESTS	NUMBER OF TESTS PERFORMED*
<b>FIELD TEST</b>			
DENSITY	ASTM D 2922 or D 2937	1/10,000sf/lift	272
MATERIAL GRAIN SIZE	< 3-INCH SIEVE FOR LOWER 18 INCHES (100% avg) < 1-INCH SIEVE FOR UPPER 6 INCHES (95% avg all tests & 100% avg 3-INCH SIEVE)	1/20,000sf/lift	136
<b>LABORATORY TEST</b>			
CLAY LINER STOCKPILE SAMPLES (BEFORE PLACEMENT)			
MOISTURE-DENSITY (PROCTOR)	ASTM D 698	1 / 10,000 cy	5
REMOLED PERMEABILITY	ASTM D 5084	1 / 10,000 cy	5
GRAIN SIZE	ASTM D 422	1	1
MOISTURE CONTENT	ASTM D 2216	1	1
ATTERBERG LIMITS	ASTM D 4318	1	1
UNDISTURBED SAMPLES (DURING PLACEMENT):			
PERMEABILITY	ASTM D 5084	1 / acre / lift	64
DRY DENSITY	ASTM D 2922	1 / acre / lift	64
MOISTURE CONTENT	ASTM D 2216	1 / acre / lift	64
BULK SAMPLES (DURING PLACEMENT):			
MOISTURE-DENSITY (PROCTOR)	ASTM D 698	2/lift	8
GRAIN SIZE	ASTM D 422	2/lift	8
MOISTURE CONTENT	ASTM D 2216	2/lift	8
ATTERBERG LIMITS	ASTM D 4318	2/lift	8

**SUMMARY OF STOCKPILE & BULK SAMPLE TEST DATA  
COMPACTED CLAY LINER**

**SUMMARY OF CQA BORROW AND BULK SAMPLE CONFORMANCE TESTING - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-38

Cell No. 12 = 651,000 sq ft (15 Acres) = 48,177 cy Clay Liner

	MATERIAL DESCRIPTION	PERCENT FINES (<#200 sieve) %	ATTERBERG LIMITS			PROCTOR PARAMETERS			REMOLD PARAMETERS			REMOLDED HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s
			LIQUID LIMIT %	PLASTICITY INDEX %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	DRY DENSITY (% COMP.) %	MOISTURE CONTENT (% WET OF OPT.) %	DRY DENSITY (% COMP.) %	MOISTURE CONTENT (% WET OF OPT.) %		
CLSP-1-C12	Light Brown & Grey fi Sandy CLAY	89.8	40.0	21.0	106.3	17.9	101.0 (95)	24.1 (6.2)	101.0 (95)	24.1 (6.2)	2.2E-08	
CLSP-2-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	105.7	18.0	101.0 (96)	23.0 (5.0)	101.0 (96)	23.0 (5.0)	2.7E-08	
CLSP-3-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	102.6	20.4	97.4 (95)	26.1 (5.7)	97.4 (95)	26.1 (5.7)	3.6E-08	
CLSP-4-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	103.8	19.0	99.1 (96)	25.0 (6.0)	101.0 (96)	24.0 (6.9)	5.0E-08	
CLSP-5-C12	Grey & brown fi.-med. Sandy CLAY	---	---	---	105.6	17.1	101.0 (96)	24.0 (6.9)	101.0 (96)	24.0 (6.9)	4.3E-08	
LTP-1-1	Light Brown & Grey fi Sandy CLAY	80.8	43	23	110.9	16.2	106 (96)	20 (3.8)	106 (96)	20 (3.8)	1.9E-08	
L-1-2	Light Brown & Grey fi Sandy CLAY	87.0	42	24	103.6	18.8	---	---	---	---	---	
LTP-2-1	Light Brown & Grey fi Sandy CLAY	71.4	41	25	108.0	18.0	103.1 (96)	22.0 (4.0)	103.1 (96)	22.0 (4.0)	1.6E-08	
L-2-2	Light Brown & Grey fi Sandy CLAY	73.4	43	26	106.2	17.1	---	---	---	---	---	
LTP-3-1	Light Brown & Grey fi Sandy CLAY	75.9	44	26	104.4	14.3	100.0 (96)	22.0 (7.7)	100.0 (96)	22.0 (7.7)	4.1E-08	
L-3-2	Light Brown & Grey fi Sandy CLAY	82.8	45	27	104.6	18.5	---	---	---	---	---	
LTP-4-1	Light Brown & Grey fi Sandy CLAY	77.3	42	24	106.8	16.5	102.1 (96)	23 (6.5)	102.1 (96)	23 (6.5)	4.6E-08	
L-4-2	Light Brown & Grey fi Sandy CLAY	87.3	45	27	108.0	14.9	---	---	---	---	---	

**PARTICLE SIZE DISTRIBUTION REPORTS**

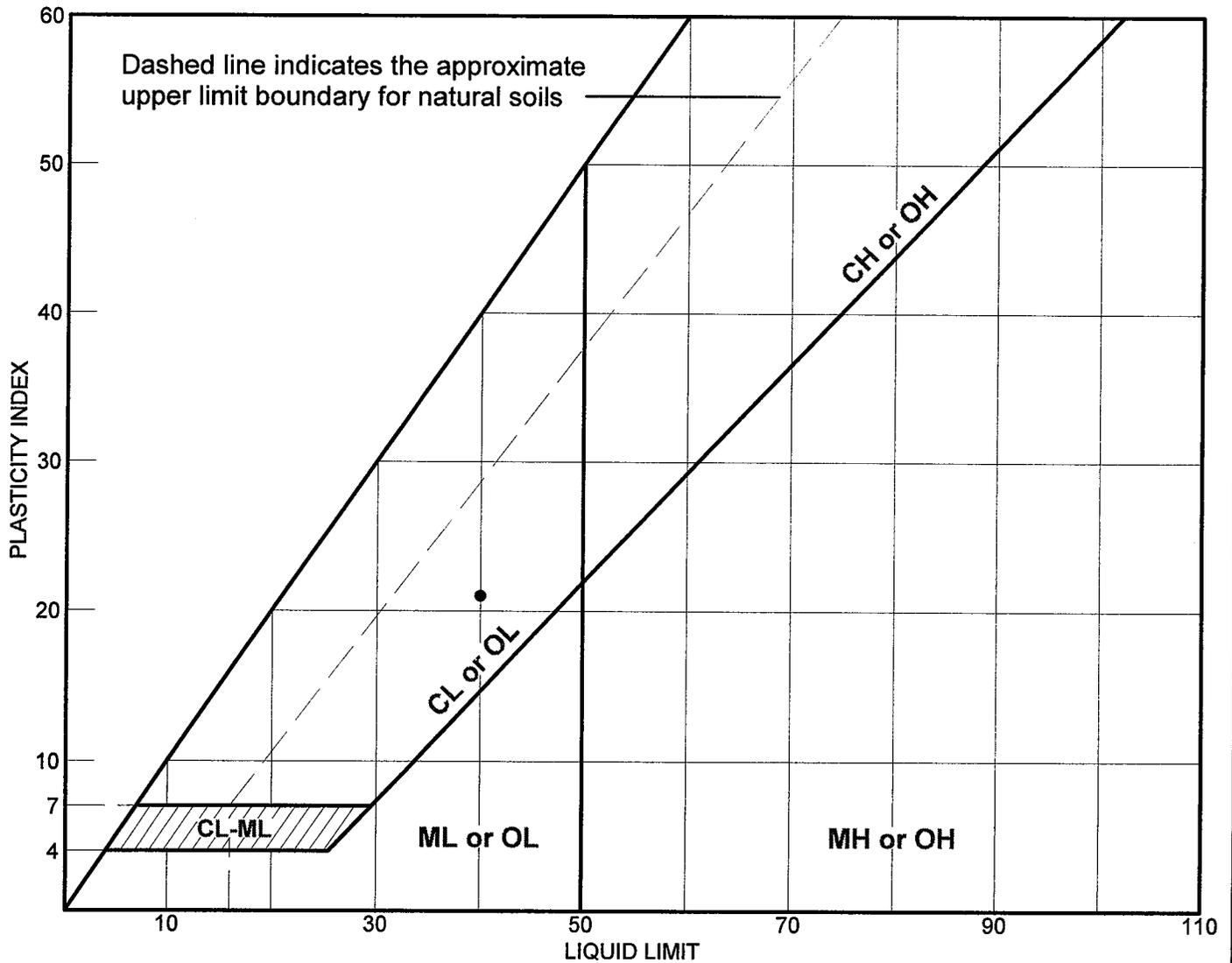






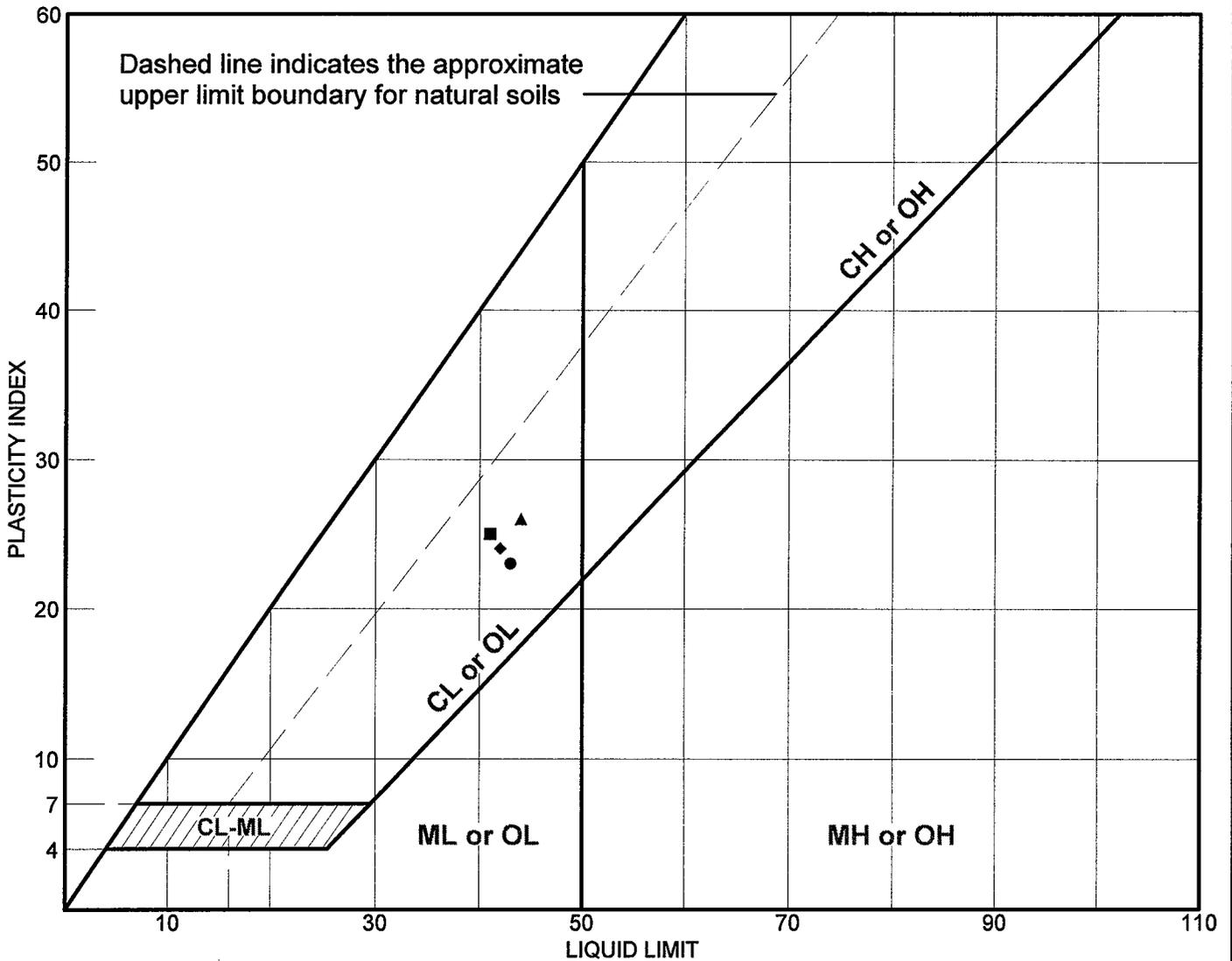
**ATTERBERG LIMITS TEST REPORTS**

# LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	Stockpile	CLSP-1-C12		21.6	19	40	21	

# LIQUID AND PLASTIC LIMITS TEST REPORT



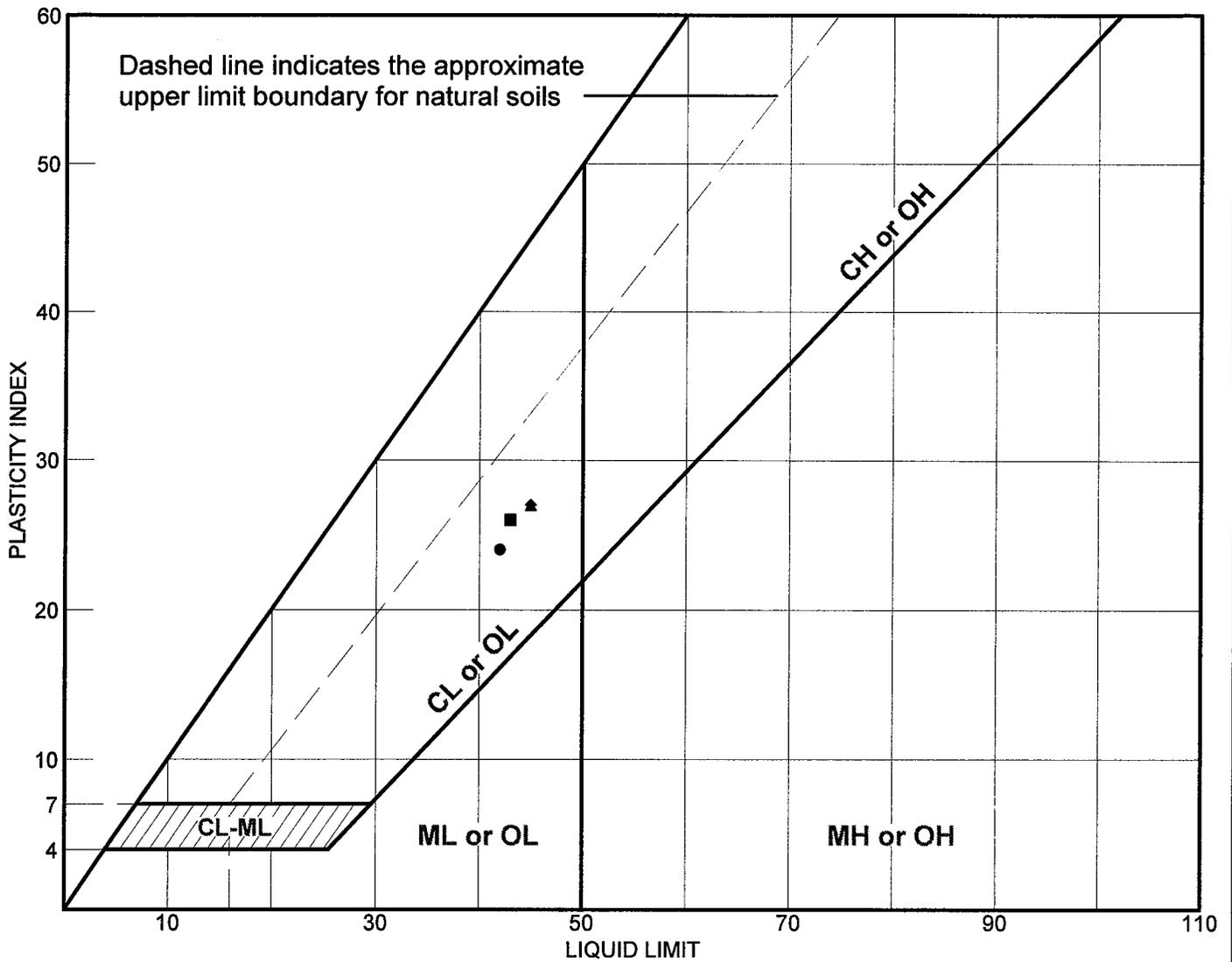
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Test Pad	LTP-1-1		19.4	20	43	23	CL
■	Test Pad	LTP-2-1		22.4	16	41	25	CL
▲	Test Pad	LTP-3-1		20.8	18	44	26	CL
◆	Test Pad	LTP-4-1		23.3	18	42	24	CL

LIQUID AND PLASTIC LIMITS TEST REPORT  
**Bunnell Lammons Engineering, Inc.**  
 Greenville, SC

**Client:** HHNT  
**Project:** East Carolina Landfill  
 Cell 12  
**Project No.:** J07-1001-58

**Plate**

# LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Liner	L-1-2		24.3	18	42	24	CL
■	Liner	L-2-2		23.5	17	43	26	CL
▲	Liner	L-3-2		22.6	18	45	27	CL
◆	Liner	L-4-2		24.8	18	45	27	CL

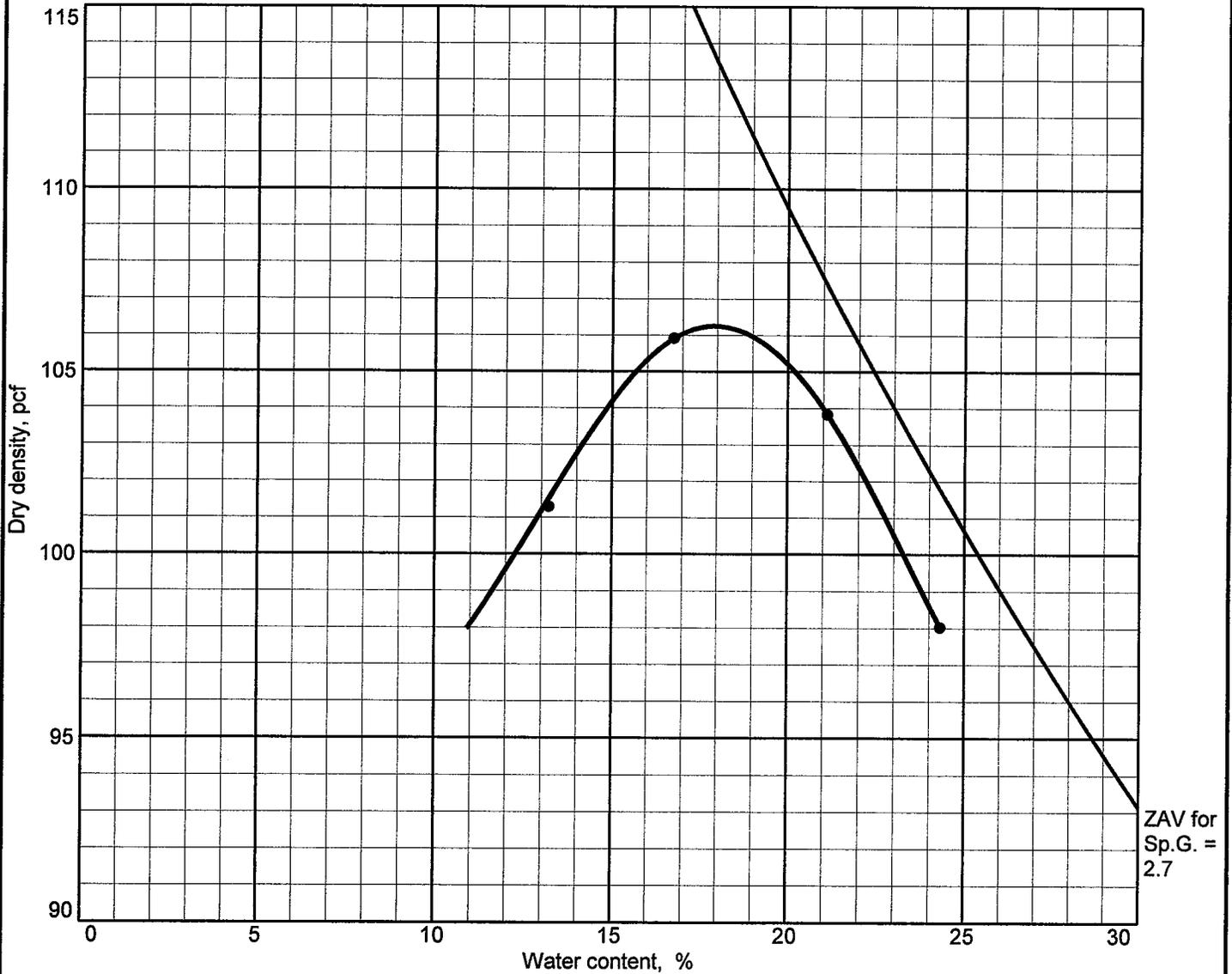
LIQUID AND PLASTIC LIMITS TEST REPORT  
**Bunnell Lammons Engineering, Inc.**  
 Greenville, SC

**Client:** HHNT  
**Project:** East Carolina Landfill  
 Cell 12  
**Project No.:** J07-1001-58

Plate

**STANDARD PROCTOR TEST REPORTS**

# MOISTURE/DENSITY RELATIONSHIP

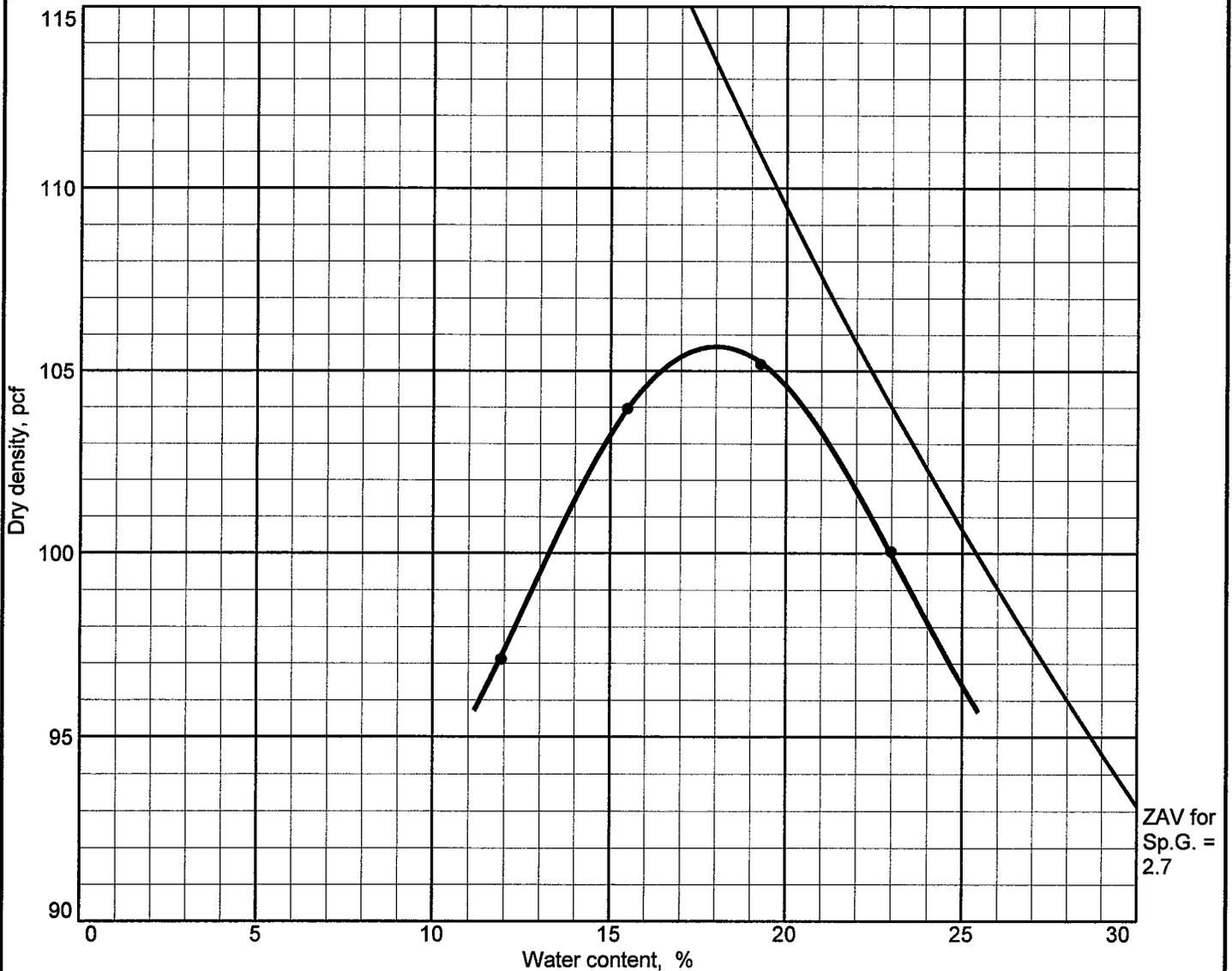


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
			21.6		40	21	0.0	89.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.3 pcf Optimum moisture = 17.9 %	Grey & brown fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-1-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP



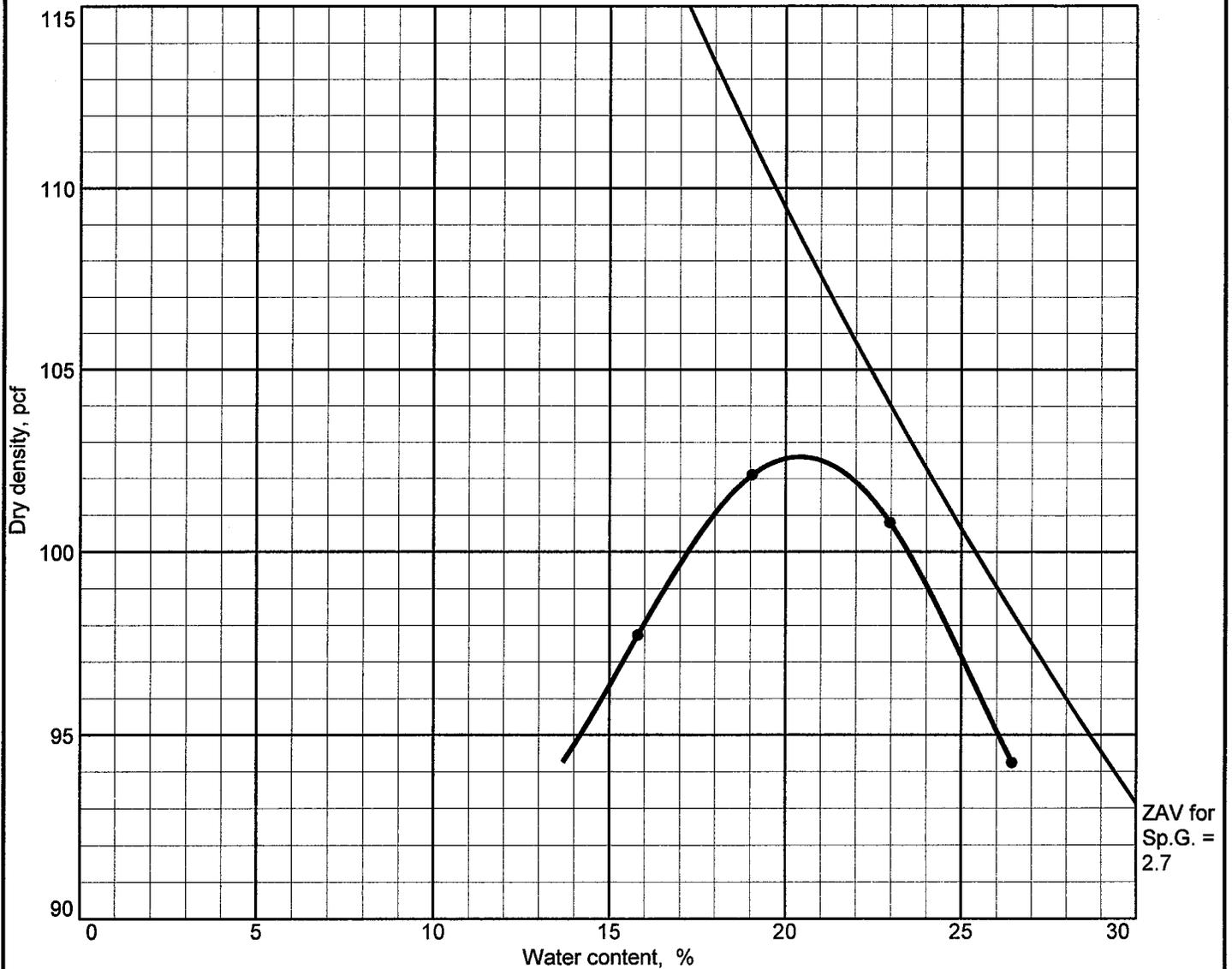
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105.7 pcf Optimum moisture = 18.0 %	Grey & brown fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-2-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



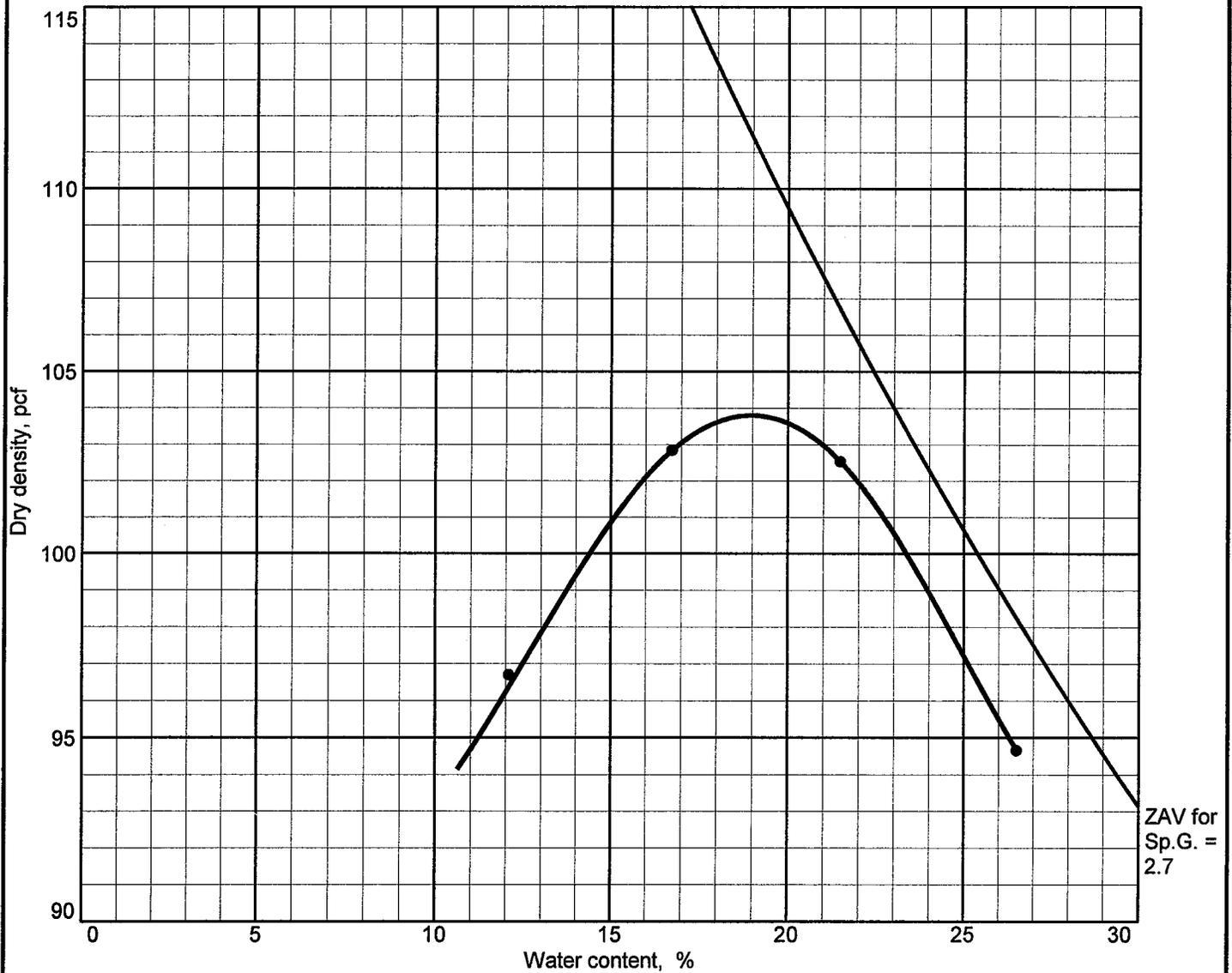
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 102.6 pcf Optimum moisture = 20.4 %	Grey & brown fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-3-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



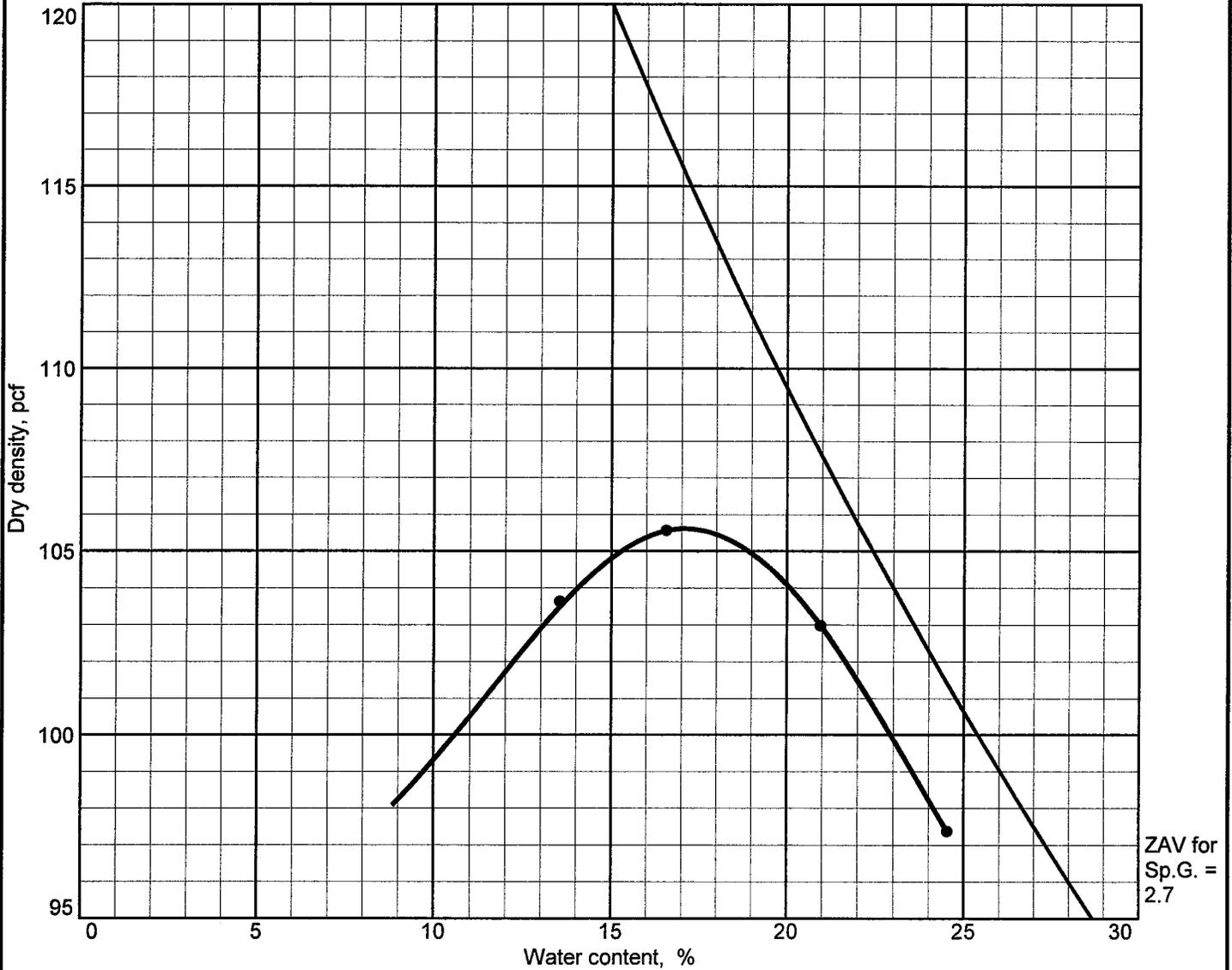
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.8 pcf Optimum moisture = 19.0 %	Light brown fi.-med. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-4-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP

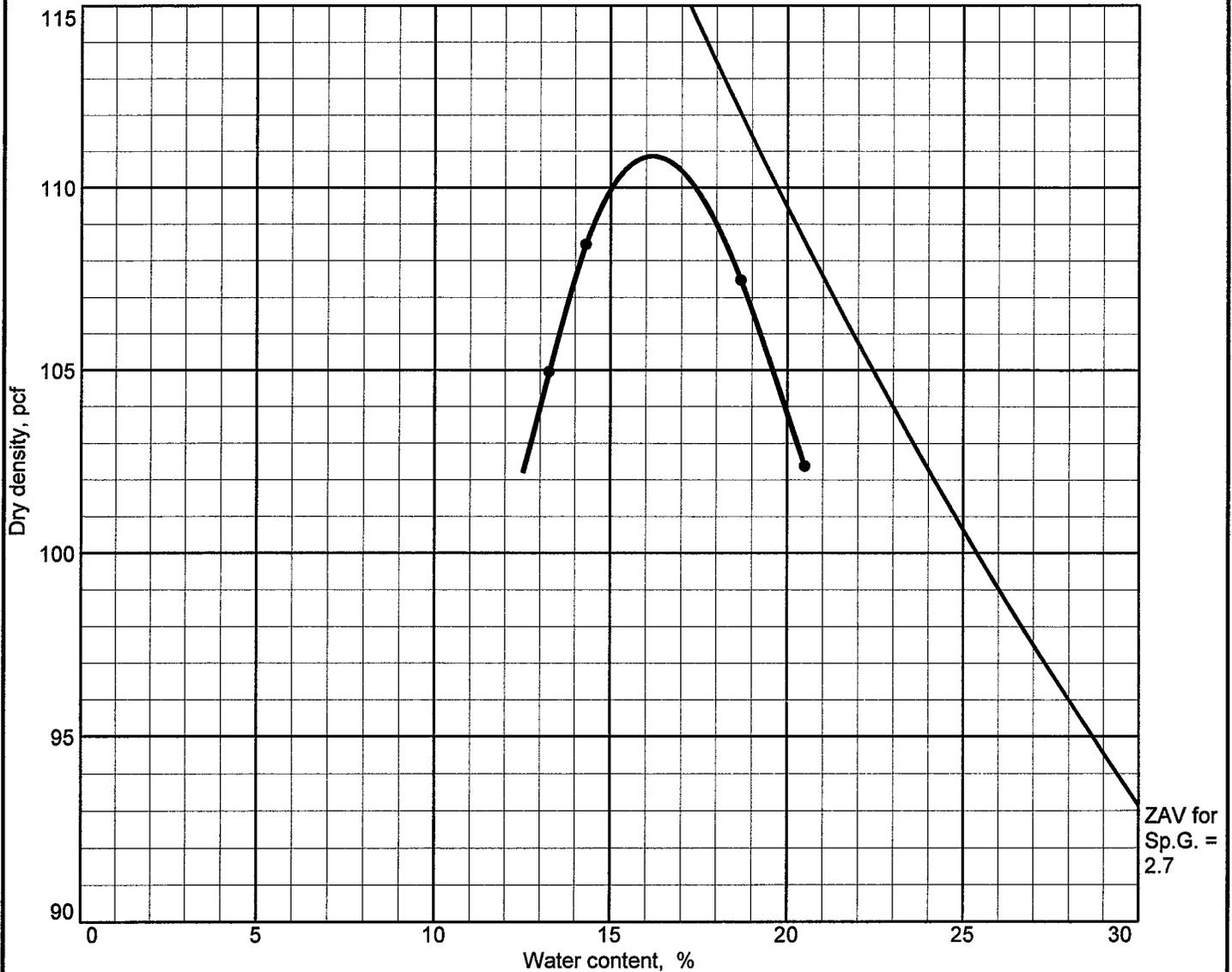


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105.6 pcf Optimum moisture = 17.1 %	Grey & brown fi.-med. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-5</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP



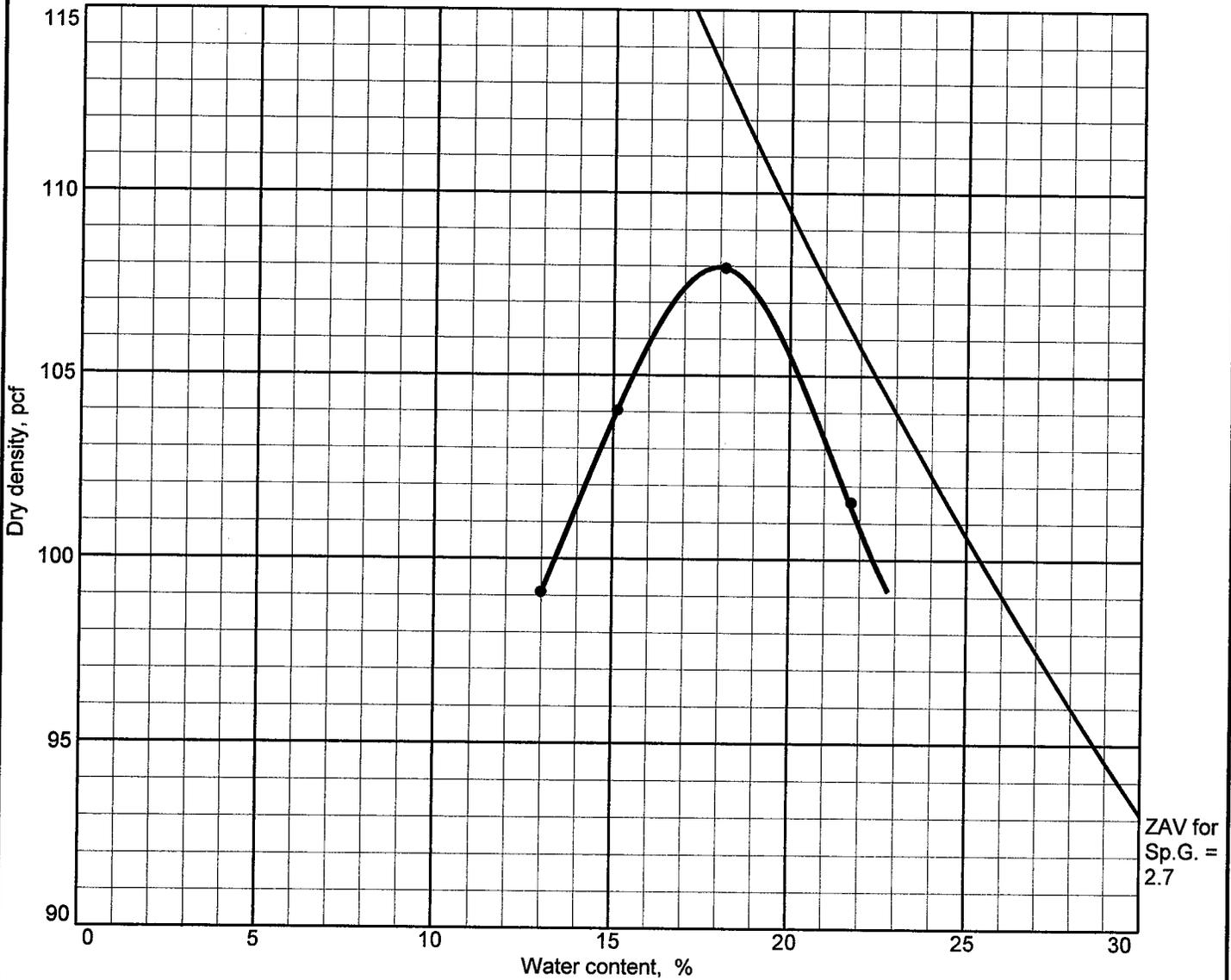
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		19.4		43	23	0.0	80.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 110.9 pcf Optimum moisture = 16.2 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-1-1</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		22.4		41	25	0.0	71.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.0 pcf Optimum moisture = 18.0 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-2-1</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



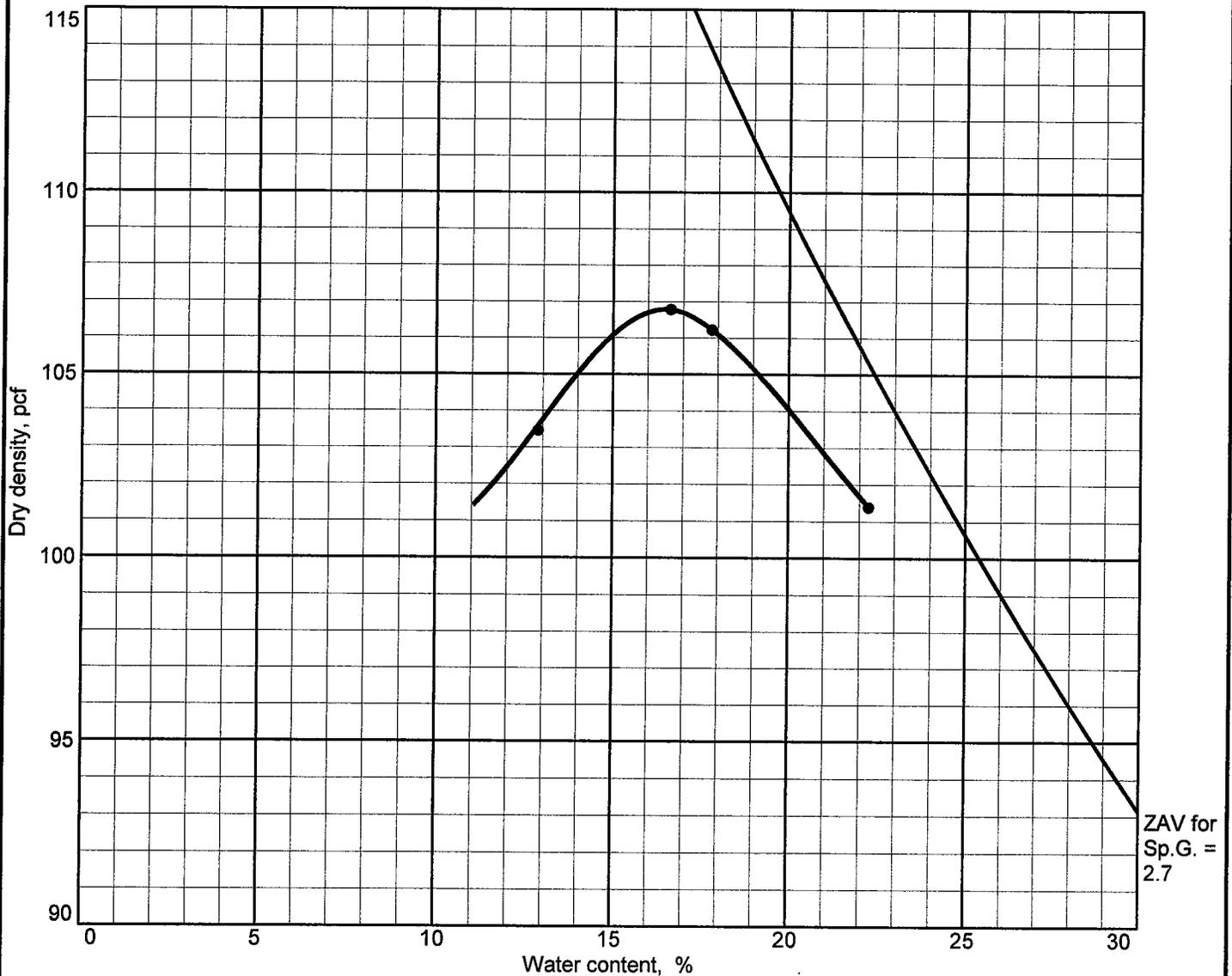
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		20.8		44	26	0.0	75.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.4 pcf Optimum moisture = 14.3 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-3-1</span>	Remarks:
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP

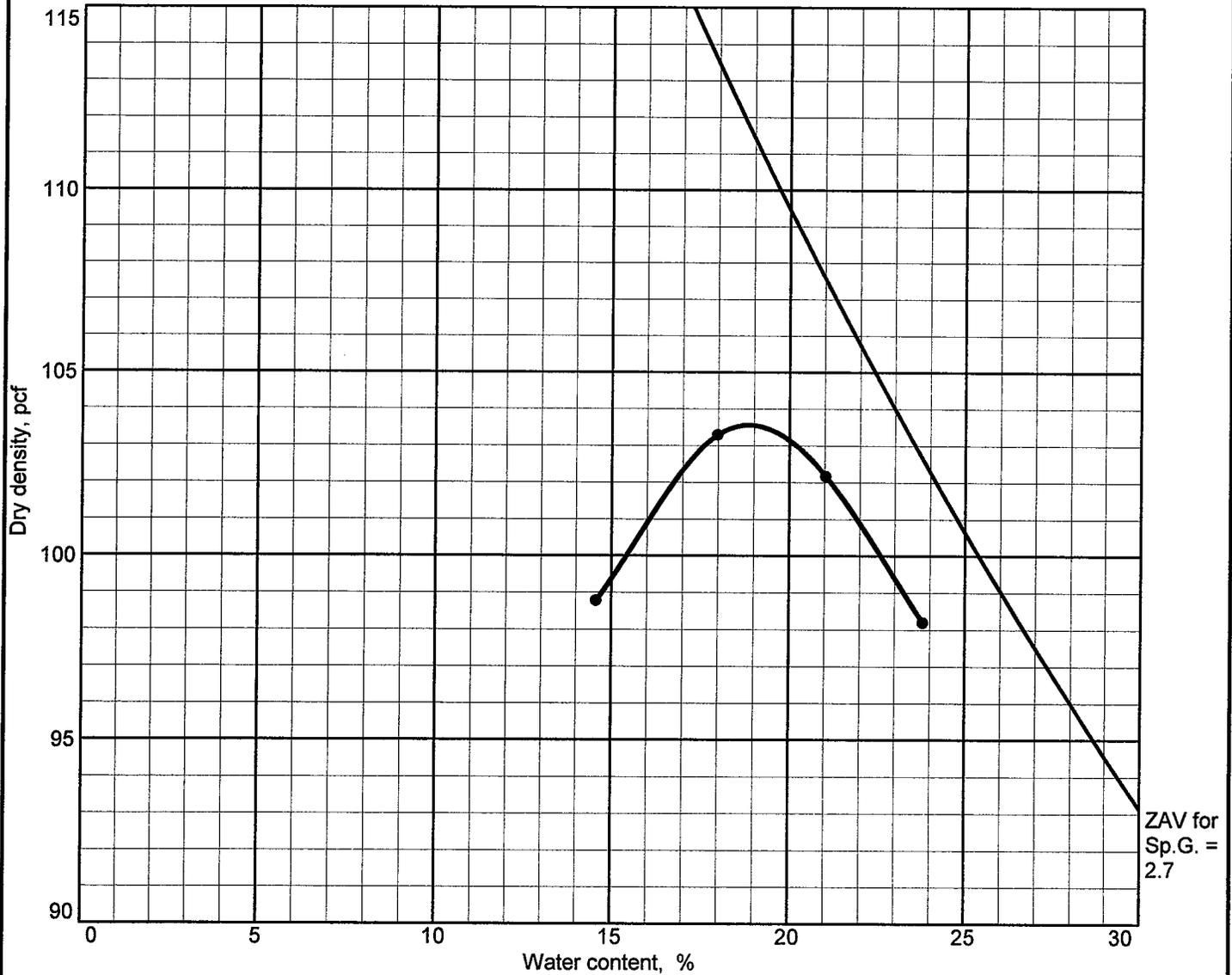


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		23.3		42	24	0.0	77.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.8 pcf Optimum moisture = 16.5 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-4-1</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP

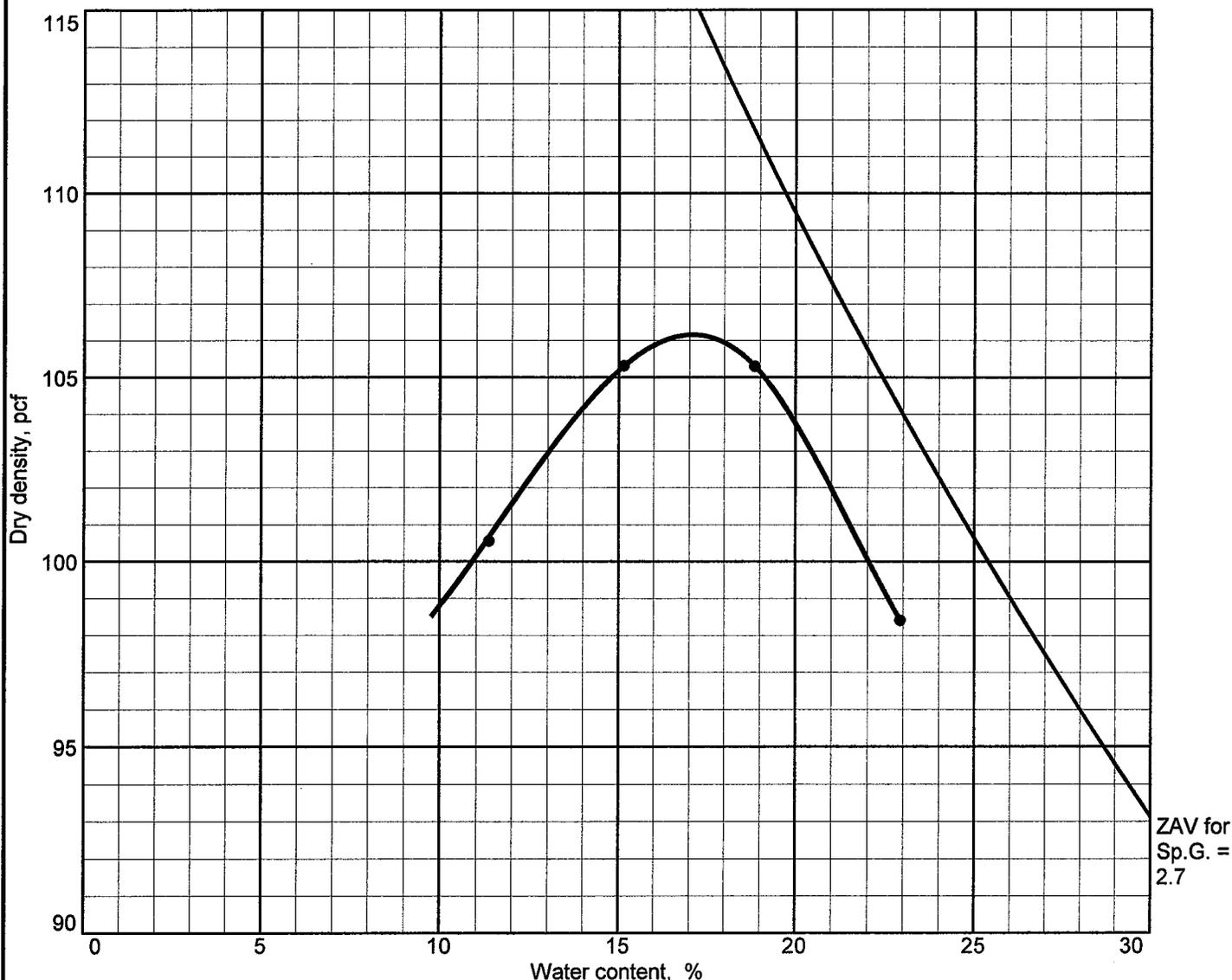


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		24.3		42	24	0.0	87.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.6 pcf Optimum moisture = 18.8 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-1-2</span>	Remarks:
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP

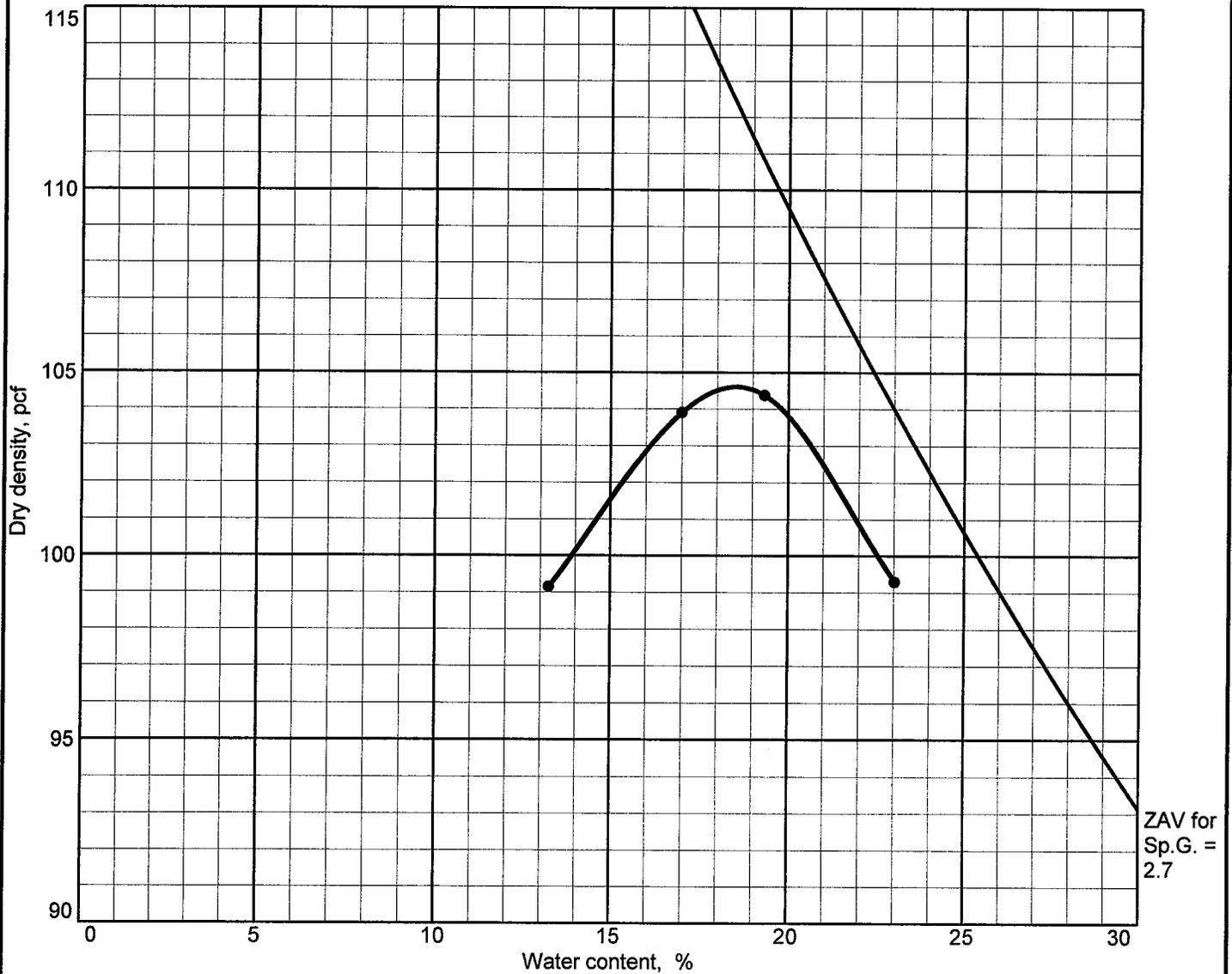


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		23.5		43	26	0.0	73.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.2 pcf Optimum moisture = 17.1 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-2-2</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP



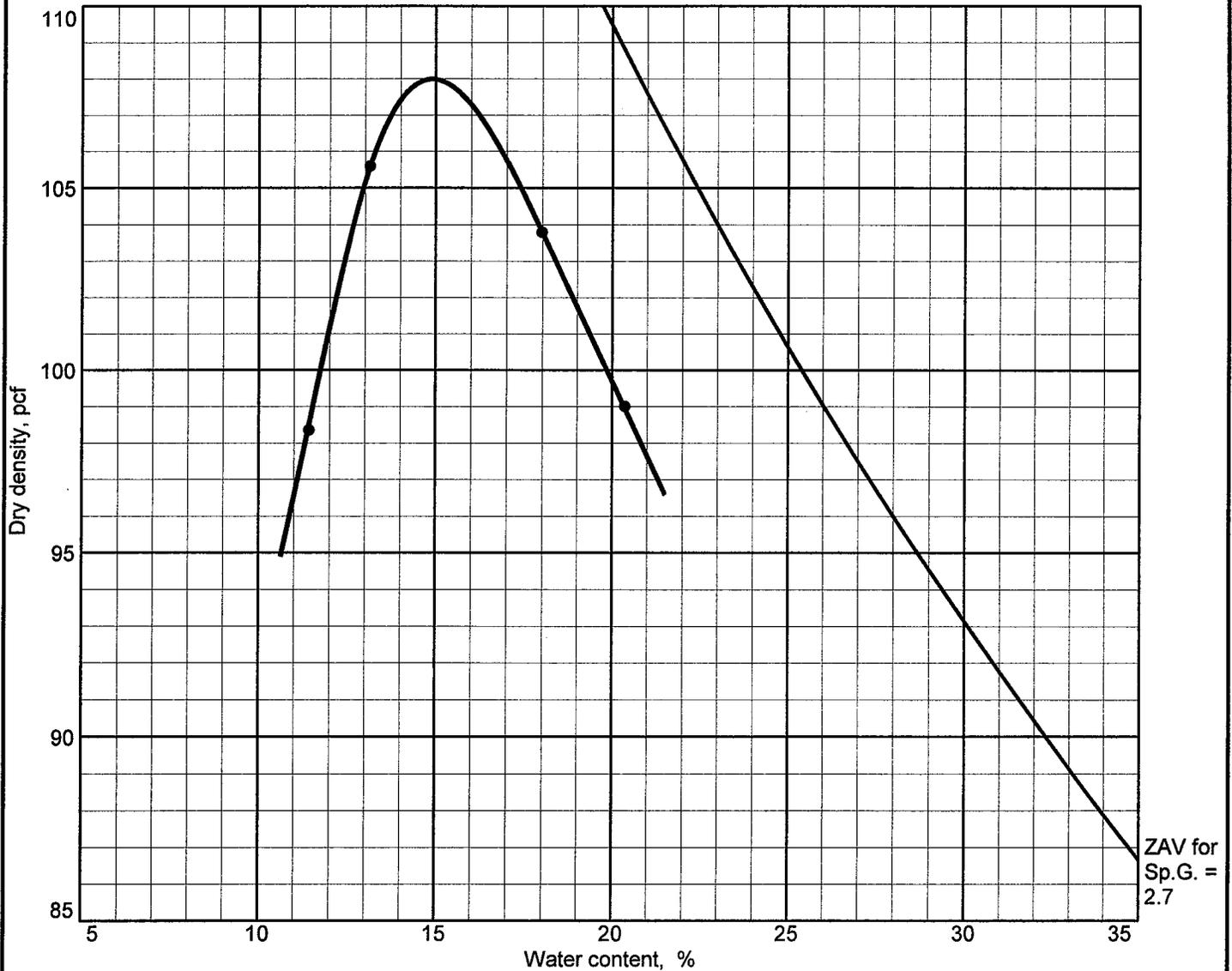
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		22.6		45	27	0.0	82.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.6 pcf Optimum moisture = 18.5 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-3-2</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		24.8		45	27	0.0	87.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.0 pcf Optimum moisture = 14.9 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-4-2</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

**HYDRAULIC CONDUCTIVITY TEST REPORTS**  
**REMOLDED SAMPLES**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 12-31-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>CLSP-1-C12</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.960	7.518
Sample Diameter	2.850	7.239	2.836	7.203
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 114.5    DW= 92.3	24.1	WW= 198.4    DW= 161.4	22.9
Sample Wet Weight (grams)	629.5		627.1	
Wet Density (pcf)	125.3		127.8	
Dry Density (pcf)	101.0		103.9	
Saturation (%)	ASSUMED SG= 2.7	97	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-3-08	1:56:48		7.1	1.69	22	10				
	1-3-08	2:26:14	0:29:26	6.6	1.71	22	9	2.4E-08	0.953	2.2E-08	
	1-3-08	2:32:43	0:35:55	6.5	1.71	22	9	2.3E-08	0.953	2.2E-08	
	1-3-08	2:39:28	0:42:40	6.4	1.72	22	9	2.3E-08	0.953	2.2E-08	
	1-3-08	2:46:53	0:50:05	6.3	1.72	22	9	2.3E-08	0.953	2.2E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.2E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.0

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.2

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 12-31-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>CLSP-2-C12</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.971	7.546
Sample Diameter	2.850	7.239	2.837	7.206
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 166.9    DW= 135.7	23.0	WW= 189.9    DW= 154.3	23.1
Sample Wet Weight (grams)	624.1		624.9	
Wet Density (pcf)	124.2		126.8	
Dry Density (pcf)	101.0		103.0	
Saturation (%)	ASSUMED SG= 2.7	93	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
(PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-3-08	1:57:15		7.5	2.09	22	10				
	1-3-08	2:15:40	0:18:25	7.1	2.10	22	9	3.0E-08	0.953	2.8E-08	
	1-3-08	2:21:26	0:24:11	7.0	2.11	22	9	2.9E-08	0.953	2.7E-08	
	1-3-08	2:27:36	0:30:21	6.9	2.11	22	9	2.8E-08	0.953	2.6E-08	
	1-3-08	2:34:04	0:36:49	6.8	2.12	22	9	2.7E-08	0.953	2.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.7E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +5.0

BLE INC.

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-3-02

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>CLSP-3-C12</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.974	7.554
Sample Diameter	2.850	7.239	2.836	7.203
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 65.2    DW= 51.7	26.1	WW= 201.0    DW= 160.0	25.6
Sample Wet Weight (grams)	617.4		614.7	
Wet Density (pcf)	122.9		124.6	
Dry Density (pcf)	97.4		99.2	
Saturation (%) <small>ASSUMED SG= 2.7</small>	97		99	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	1-7-08	2:28:49		7.5	2.09	21	10			
	1-7-08	3:13:21	0:44:32	6.4	2.13	21	8	3.7E-08	0.976	3.6E-08
	1-7-08	3:18:10	0:49:21	6.3	2.14	21	8	3.7E-08	0.976	3.6E-08
	1-7-08	3:23:29	0:54:40	6.2	2.14	21	8	3.6E-08	0.976	3.5E-08
	1-7-08	3:28:41	0:59:52	6.1	2.14	21	7	3.6E-08	0.976	3.5E-08

**HYDRAULIC CONDUCTIVITY (k)      3.5E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      94.9  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +5.7

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-21-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>CLSP-4-C12</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>LIGHT BROWN FI.-MED. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.958	7.513
Sample Diameter	2.850	7.239	2.844	7.224
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 134.2    DW= 107.4	25.0	WW= 255.0    DW= 206.8	23.3
Sample Wet Weight (grams)	621.9		622.4	
Wet Density (pcf)	123.8		126.2	
Dry Density (pcf)	99.1		102.3	
Saturation (%) <small>ASSUMED SG= 2.7</small>	96		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) 75		Influent Pressure (psi) 60		Effluent Pressure (psi) 60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-27-08	3:40:55		10.2	1.98	22	15			
	2-27-08	4:02:37	0:21:42	9.0	2.03	22	13	5.2E-08	0.953	5.0E-08
	2-27-08	4:04:35	0:23:40	8.9	2.03	22	13	5.2E-08	0.953	5.0E-08
	2-27-08	4:06:40	0:25:45	8.8	2.03	22	12	5.2E-08	0.953	5.0E-08
	2-27-08	4:08:53	0:27:58	8.7	2.04	22	12	5.2E-08	0.953	4.9E-08

**HYDRAULIC CONDUCTIVITY (k)      5.0E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.5

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.0

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>CLSP-5-C12</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL.-MED. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.987	7.587
Sample Diameter	2.850	7.239	2.842	7.219
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 112.2    DW= 90.5	24.0	WW= 232.5    DW= 187.6	23.9
Sample Wet Weight (grams)	629.2		628.9	
Wet Density (pcf)	125.2		126.4	
Dry Density (pcf)	101.0		102.0	
Saturation (%)	ASSUMED SG= 2.7	97	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	4-25-08	2:22:45		7.5	2.09	21	10				
	4-25-08	2:49:17	0:26:32	6.6	2.12	21	8	4.9E-08	0.976	4.8E-08	
	4-25-08	2:52:34	0:29:49	6.5	2.13	21	8	4.9E-08	0.976	4.8E-08	
	4-25-08	2:55:57	0:33:12	6.4	2.13	21	8	4.9E-08	0.976	4.8E-08	
	4-25-08	2:59:26	0:36:41	6.3	2.14	21	8	4.9E-08	0.976	4.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.8E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.9

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHIEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LTP-1-1</u>	SAMPLE LOCATION:	<u>TEST PAD LIFT 1</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>LIGHT BROWN &amp; GREY FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.954	7.503
Sample Diameter	2.850	7.239	2.845	7.226
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 160.6    DW= 133.8	20.0	WW= 225.1    DW= 187.0	20.4
Sample Wet Weight (grams)	639.3		638.8	
Wet Density (pcf)	127.3		129.6	
Dry Density (pcf)	106.0		107.7	
Saturation (%)	ASSUMED SG= 2.7	92	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-19-08	3:52:30		9.8	1.58	22	15				
	2-19-08	4:20:09	0:27:39	9.2	1.60	22	14	2.0E-08	0.953	1.9E-08	
	2-19-08	4:24:45	0:32:15	9.1	1.61	22	14	2.0E-08	0.953	1.9E-08	
	2-19-08	4:30:12	0:37:42	9.0	1.61	22	14	1.9E-08	0.953	1.9E-08	
	2-19-08	4:36:15	0:43:45	8.9	1.61	22	13	1.9E-08	0.953	1.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.9E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +3.8

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LTP-2-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 2</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>LIGHT BROWN &amp; GREY FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.970	7.544
Sample Diameter	2.850	7.239	2.851	7.242
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 164.9    DW= 135.2	22.0	WW= 240.6    DW= 196.1	22.7
Sample Wet Weight (grams)	631.5		633.3	
Wet Density (pcf)	125.7		127.2	
Dry Density (pcf)	103.1		103.7	
Saturation (%)	93		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	8:02:14		9.8	1.58	21	15				
-	2-20-08	8:48:23	0:46:09	9.0	1.61	21	14	1.6E-08	0.976	1.6E-08	
	2-20-08	8:54:03	0:51:49	8.9	1.61	21	13	1.6E-08	0.976	1.6E-08	
	2-20-08	9:00:16	0:58:02	8.8	1.62	21	13	1.6E-08	0.976	1.6E-08	
	2-20-08	9:06:49	1:04:35	8.7	1.62	21	13	1.6E-08	0.976	1.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.6E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.7

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +4.0

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LTP-3-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 3</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>LIGHT BROWN &amp; GREY FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.948	7.488
Sample Diameter	2.850	7.239	2.854	7.249
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 151.5    DW= 124.2	22.0	WW= 216.2    DW= 175.3	23.3
Sample Wet Weight (grams)	613.1		621.6	
Wet Density (pcf)	122.0		125.6	
Dry Density (pcf)	100.0		101.8	
Saturation (%)	87		96	
	ASSUMED SG= 2.7			

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-19-08	3:55:27		10.2	1.98	22	15			
	2-19-08	4:21:34	0:26:07	9.0	2.03	22	13	4.3E-08	0.953	4.1E-08
	2-19-08	4:23:57	0:28:30	8.9	2.03	22	13	4.3E-08	0.953	4.1E-08
	2-19-08	4:26:31	0:31:04	8.8	2.03	22	12	4.3E-08	0.953	4.1E-08
	2-19-08	4:29:14	0:33:47	8.7	2.04	22	12	4.3E-08	0.953	4.1E-08

**HYDRAULIC CONDUCTIVITY (k)      4.1E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.8

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +7.7

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LTP-4-1</u>	SAMPLE LOCATION:	<u>TEST PAD LIFT 4</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>LIGHT BROWN &amp; GREY FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.967	7.536
Sample Diameter	2.850	7.239	2.848	7.234
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 128.0    DW= 104.1	23.0	WW= 236.8    DW= 194.0	22.1
Sample Wet Weight (grams)	630.5		628.1	
Wet Density (pcf)	125.5		126.6	
Dry Density (pcf)	102.1		103.7	
Saturation (%)	ASSUMED SG= 2.7	95	95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	8:02:51		10.2	1.98	21	15				
	2-20-08	8:50:13	0:47:22	8.0	2.07	21	11	4.7E-08	0.976	4.6E-08	
	2-20-08	8:52:42	0:49:51	7.9	2.07	21	11	4.7E-08	0.976	4.6E-08	
	2-20-08	8:55:23	0:52:32	7.8	2.07	21	11	4.7E-08	0.976	4.6E-08	
	2-20-08	8:58:07	0:55:16	7.7	2.08	21	10	4.7E-08	0.976	4.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.6E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.5

**SUMMARY OF UNDISTURBED SAMPLES HYDRAULIC  
CONDUCTIVITY TEST RESULTS**

# SUMMARY OF CLAY LINER HYDRAULIC CONDUCTIVITY TESTING

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BLE Project No. J07-1001-58

Cell No. 12 area = 667,000 sq ft (15.3 Acres) = 48,177 cy Clay Liner

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-1-1	1	CLD-2	22	4.6 E-08	PASS
LP-1-2	1	CLD-7	25	7.5 E-08	PASS
LP-1-3	1	CLD-10	13	4.1 E-08	PASS
LP-1-4	1	CLD-15	29	4.2 E-08	PASS
LP-1-5	1	CLD-20	5	3.6 E-08	PASS
LP-1-6	1	CLD-23	18	3.9 E-08	PASS
LP-1-7	1	CLD-29	42	3.4 E-08	PASS
LP-1-8	1	CLD-32	56	2.1 E-08	PASS
LP-1-9	1	CLD-37	38	2.9 E-08	PASS
LP-1-10	1	CLD-40	52	2.2 E-08	PASS
LP-1-11	1	CLD-43	60	5.0 E-08	PASS
LP-1-12	1	CLD-48	46	1.8 E-08	PASS
LP-1-13	1	CLD-95	33	3.6 E-08	PASS
LP-1-14	1	CLD-97	49	6.4 E-08	PASS
LP-1-15	1	CLD-238	20	3.1 E-08	PASS
LP-1-16	1	CLD-243	51	3.6 E-08	PASS

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-2-1	2	CLD-54	55	5.1 E-08	PASS
LP-2-2	2	CLD-60	41	2.1 E-08	PASS
LP-2-3	2	CLD-62	37	3.6 E-08	PASS
LP-2-4	2	CLD-67	10	3.0 E-08	PASS
LP-2-5	2	CLD-71	12	6.1 E-08	PASS
LP-2-6	2	CLD-121	3	1.7 E-08	PASS
LP-2-7	2	CLD-126	28	3.5 E-08	PASS
LP-2-8	2	CLD-128	59	2.8 E-08	PASS
LP-2-9	2	CLD-133	45	2.5 E-08	PASS
LP-2-10	2	CLD-135	16	3.4 E-08	PASS
LP-2-11	2	CLD-139	31	2.6 E-08	PASS
LP-2-12	2	CLD-142	63	2.5 E-08	PASS
LP-2-13	2	CLD-146	7	2.5 E-08	PASS
LP-2-14	2	CLD-148	64	2.9 E-08	PASS
LP-2-15	2	CLD-157	66	1.7 E-08	PASS
LP-2-16	2	CLD-250	35	2.6 E-08	PASS

Project Specification:  $k < 1 \text{ E-}07 \text{ cm/s}$

(TP): Test Pad Sample

Updated on: 5/30/2008

Updated by: Helvey

# SUMMARY OF CLAY LINER HYDRAULIC CONDUCTIVITY TESTING

CONSTRUCTION OF CELL NO. 12  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA  
 BLE Project No. J07-1001-58

Cell No. 12 area = 667,000 sq ft (15.3 Acres) = 48,177 cy Clay Liner

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-3-1	3	CLD-72	57	2.0 E-08	PASS
LP-3-2	3	CLD-74	53	2.2 E-08	PASS
LP-3-3	3	CLD-76	54	3.3 E-08	PASS
LP-3-4	3	CLD-86	11	3.3 E-08	PASS
LP-3-5	3	CLD-90	10	2.8 E-08	PASS
LP-3-6	3	CLD-159	27	1.8 E-08	PASS
LP-3-7	3	CLD-163	43	2.6 E-08	PASS
LP-3-8	3	CLD-168	15	2.6 E-08	PASS
LP-3-9	3	CLD-176	61	4.6 E-08	PASS
LP-3-10	3	CLD-180	17	1.5 E-08	PASS
LP-3-11	3	CLD-182	1	1.4 E-08	PASS
LP-3-12	3	CLD-186	47	1.3 E-08	PASS
LP-3-13	3	CLD-192	65	4.9 E-08	PASS
LP-3-14	3	CLD-194	19	3.4 E-08	PASS
LP-3-15	3	CLD-255	67	4.7 E-08	PASS
LP-3-16	3	CLD-262	9	2.80E-08	PASS

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-4-1	4	CLD-98	36	2.8 E-08	PASS
LP-4-2	4	CLD-104	26	4.7 E-08	PASS
LP-4-3	4	CLD-106	24	3.5 E-08	PASS
LP-4-4	4	CLD-108	40	2.2 E-08	PASS
LP-4-5	4	CLD-109	39	2.4 E-08	PASS
LP-4-6	4	CLD-201	58	4.7 E-08	PASS
LP-4-7	4	CLD-205	14	2.8 E-08	PASS
LP-4-8	4	CLD-208	44	2.7 E-08	PASS
LP-4-9	4	CLD-214	30	2.0 E-08	PASS
LP-4-10	4	CLD-217	62	4.3 E-08	PASS
LP-4-11	4	CLD-221	6	4.0 E-08	PASS
LP-4-12	4	CLD-225	32	3.9 E-08	PASS
LP-4-13	4	CLD-229	48	2.6 E-08	PASS
LP-4-14	4	CLD-231	19	1.9 E-08	PASS
LP-4-15	4	CLD-266	68	1.80E-08	PASS
LP-4-16	4	CLD-270	21	3.1E-08	PASS

Project Specification:  $k < 1 \text{ E-}07 \text{ cm/s}$

(TP): Test Pad Sample

Updated on: 5/30/2008

Updated by: Helvey

**HYDRAULIC CONDUCTIVITY TEST REPORTS**  
**UNDISTURBED SAMPLES**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-1-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.960	7.518	2.916	7.407
Sample Diameter	2.859	7.262	2.852	7.244
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 132.7    DW= 107.2	23.8	WW= 234.1    DW= 188.4	24.3
Sample Wet Weight (grams)	619.3		617.2	
Wet Density (pcf)	124.2		126.2	
Dry Density (pcf)	100.3		101.6	
Saturation (%)	94		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)

**HYDRAULIC CONDUCTIVITY (k)    4.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-2</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.975	7.557	2.952	7.498
Sample Diameter	2.862	7.269	2.853	7.247
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 159.6    DW= 127.8	24.9	WW= 195.5    DW= 156.4	25.0
Sample Wet Weight (grams)	615.1		614.8	
Wet Density (pcf)	122.4		124.1	
Dry Density (pcf)	98.0		99.3	
Saturation (%)	ASSUMED SG= 2.7	94	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	12:25:00		10.1	1.98	21	15				
	1-30-08	12:49:41	0:24:41	8.2	2.06	21	11	7.6E-08	0.976	7.5E-08	
	1-30-08	12:51:12	0:26:12	8.1	2.06	21	11	7.6E-08	0.976	7.5E-08	
	1-30-08	12:52:44	0:27:44	8.0	2.07	21	11	7.6E-08	0.976	7.5E-08	
	1-30-08	12:54:19	0:29:19	7.9	2.07	21	11	7.6E-08	0.976	7.4E-08	

**HYDRAULIC CONDUCTIVITY (k)      7.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-3</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.957	7.511	2.927	7.435
Sample Diameter	2.860	7.264	2.861	7.267
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 131.8    DW= 108.5	21.5	WW= 205.7    DW= 168.1	22.4
Sample Wet Weight (grams)	623.0		621.5	
Wet Density (pcf)	124.9		125.8	
Dry Density (pcf)	102.8		102.8	
Saturation (%)	ASSUMED SG= 2.7	91	95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	1:09:25		9.7	1.58	21	15				
	1-30-08	1:31:16	0:21:51	8.7	1.62	21	13	4.2E-08	0.976	4.1E-08	
	1-30-08	1:33:49	0:24:24	8.6	1.63	21	13	4.2E-08	0.976	4.1E-08	
	1-30-08	1:36:27	0:27:02	8.5	1.63	21	13	4.2E-08	0.976	4.1E-08	
	1-30-08	1:38:50	0:29:25	8.4	1.63	21	13	4.2E-08	0.976	4.1E-08	

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>4.1E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-4</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.944	7.478	2.916	7.407
Sample Diameter	2.861	7.267	2.851	7.242
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 146.6    DW= 120.7	21.5	WW= 228.6    DW= 187.0	22.2
Sample Wet Weight (grams)	630.5		630.1	
Wet Density (pcf)	126.9		128.9	
Dry Density (pcf)	104.5		105.5	
Saturation (%)	ASSUMED SG= 2.7	95	101	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	1:09:54		10.0	1.98	21	15				
	1-30-08	1:31:38	0:21:44	9.0	2.03	21	13	4.3E-08	0.976	4.2E-08	
	1-30-08	1:34:05	0:24:11	8.9	2.03	21	13	4.3E-08	0.976	4.2E-08	
	1-30-08	1:36:29	0:26:35	8.8	2.03	21	13	4.3E-08	0.976	4.2E-08	
	1-30-08	1:39:03	0:29:09	8.7	2.04	21	12	4.2E-08	0.976	4.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.2E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-5</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.951	7.496	2.930	7.442
Sample Diameter	2.860	7.264	2.858	7.259
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 170.1    DW= 139.5	21.9	WW= 224.4    DW= 183.9	22.0
Sample Wet Weight (grams)	627.7		630.3	
Wet Density (pcf)	126.1		127.7	
Dry Density (pcf)	103.4		104.7	
Saturation (%)	ASSUMED SG= 2.7	94	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	6:11:05		10.1	1.98	21	15				
	1-30-08	6:33:34	0:22:29	9.2	2.02	21	13	3.7E-08	0.976	3.6E-08	
	1-30-08	6:36:15	0:25:10	9.1	2.02	21	13	3.7E-08	0.976	3.6E-08	
	1-30-08	6:39:05	0:28:00	9.0	2.03	21	13	3.6E-08	0.976	3.6E-08	
	1-30-08	6:41:48	0:30:43	8.9	2.03	21	13	3.6E-08	0.976	3.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-6</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.955	7.506	2.928	7.437
Sample Diameter	2.857	7.257	2.860	7.264
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 165.2    DW= 136.8	20.8	WW= 207.5    DW= 169.3	22.6
Sample Wet Weight (grams)	622.1		624.3	
Wet Density (pcf)	125.1		126.4	
Dry Density (pcf)	103.6		103.2	
Saturation (%)	ASSUMED SG= 2.7	89	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	6:14:52		9.7	1.58	21	15				
	1-30-08	6:33:15	0:18:23	8.9	1.61	21	14	4.0E-08	0.976	3.9E-08	
	1-30-08	6:35:41	0:20:49	8.8	1.62	21	13	4.0E-08	0.976	3.9E-08	
	1-30-08	6:38:19	0:23:27	8.7	1.62	21	13	3.9E-08	0.976	3.8E-08	
	1-30-08	6:40:58	0:26:06	8.6	1.63	21	13	3.9E-08	0.976	3.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.9E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-7</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.012	7.650	3.006	7.635
Sample Diameter	2.855	7.252	2.856	7.254
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 145.0	DW= 120.0	20.8	WW= 235.2 DW= 195.2 20.5
Sample Wet Weight (grams)	643.7		647.0	
Wet Density (pcf)	127.2		128.0	
Dry Density (pcf)	105.2		106.2	
Saturation (%)	94		94	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	3:47:53		10.2	1.98	21	15				
	2-4-08	4:14:28	0:26:35	9.2	2.02	21	13	3.5E-08	0.976	3.4E-08	
	2-4-08	4:17:15	0:29:22	9.1	2.02	21	13	3.5E-08	0.976	3.4E-08	
	2-4-08	4:20:08	0:32:15	9.0	2.03	21	13	3.5E-08	0.976	3.4E-08	
	2-4-08	4:23:13	0:35:20	8.9	2.03	21	13	3.5E-08	0.976	3.4E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-8</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.933	7.450	2.929	7.440
Sample Diameter	2.857	7.257	2.861	7.267
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 106.1    DW= 87.2	21.7	WW= 218.9    DW= 179.1	22.2
Sample Wet Weight (grams)	623.7		626.7	
Wet Density (pcf)	126.4		126.8	
Dry Density (pcf)	103.9		103.7	
Saturation (%)	ASSUMED SG= 2.7	94	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	2:20:04		9.6	1.58	21	15				
	2-1-08	2:54:50	0:34:46	8.8	1.62	21	13	2.1E-08	0.976	2.1E-08	
	2-1-08	2:58:47	0:38:43	8.7	1.62	21	13	2.1E-08	0.976	2.1E-08	
	2-1-08	3:03:23	0:43:19	8.6	1.63	21	13	2.1E-08	0.976	2.1E-08	
	2-1-08	3:08:12	0:48:08	8.5	1.63	21	13	2.1E-08	0.976	2.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-9</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.938	7.463	2.911	7.394
Sample Diameter	2.850	7.239	2.851	7.242
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 115.7    DW= 93.3	24.0	WW= 206.2    DW= 166.3	24.0
Sample Wet Weight (grams)	613.4		615.1	
Wet Density (pcf)	124.7		126.1	
Dry Density (pcf)	100.5		101.7	
Saturation (%)	ASSUMED SG= 2.7	96	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-6-08	2:23:20		9.6	1.58	21	15				
	2-6-08	2:58:32	0:35:12	8.5	1.63	21	13	2.9E-08	0.976	2.9E-08	
	2-6-08	3:02:03	0:38:43	8.4	1.63	21	13	2.9E-08	0.976	2.9E-08	
	2-6-08	3:05:41	0:42:21	8.3	1.64	21	12	2.9E-08	0.976	2.9E-08	
	2-6-08	3:09:38	0:46:18	8.2	1.64	21	12	2.9E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.9E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHIEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-10</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.935	7.455	2.923	7.424
Sample Diameter	2.859	7.262	2.863	7.272
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 135.4 DW= 111.8	21.1	WW= 205.2 DW= 169.7	20.9
Sample Wet Weight (grams)	629.6		633.0	
Wet Density (pcf)	127.3		128.1	
Dry Density (pcf)	105.1		106.0	
Saturation (%)	ASSUMED SG= 2.7 95		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	3:14:23		9.6	1.58	21	15				
	2-1-08	3:54:36	0:40:13	8.6	1.63	21	13	2.3E-08	0.976	2.3E-08	
	2-1-08	3:59:03	0:44:40	8.5	1.63	21	13	2.3E-08	0.976	2.2E-08	
	2-1-08	4:03:39	0:49:16	8.4	1.63	21	13	2.3E-08	0.976	2.2E-08	
	2-1-08	4:08:29	0:54:06	8.3	1.64	21	13	2.3E-08	0.976	2.2E-08	

**HYDRAULIC CONDUCTIVITY (k) 2.2E-08 cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-11</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.911	7.394	2.900	7.366
Sample Diameter	2.857	7.257	2.852	7.244
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 111.7    DW= 91.2	22.5	WW= 227.1    DW= 185.7	22.3
Sample Wet Weight (grams)	613.1		615.2	
Wet Density (pcf)	125.2		126.5	
Dry Density (pcf)	102.2		103.4	
Saturation (%)	94		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) <u>75</u>		Influent Pressure (psi) <u>60</u>				Effluent Pressure (psi) <u>60</u>				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-1-08	2:55:10		10.0	1.98	21	15			
	2-1-08	3:21:02	0:25:52	8.6	2.04	21	12	5.1E-08	0.976	5.0E-08
	2-1-08	3:23:19	0:28:09	8.5	2.05	21	12	5.1E-08	0.976	5.0E-08
	2-1-08	3:25:42	0:30:32	8.4	2.05	21	12	5.1E-08	0.976	4.9E-08
	2-1-08	3:27:58	0:32:48	8.3	2.05	21	12	5.0E-08	0.976	4.9E-08

**HYDRAULIC CONDUCTIVITY (k)      5.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-12</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.969	7.541	2.955	7.506
Sample Diameter	2.860	7.264	2.848	7.234
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 153.8    DW= 131.4	17.0	WW= 207.9    DW= 170.9	21.7
Sample Wet Weight (grams)	637.1		638.2	
Wet Density (pcf)	127.2		129.2	
Dry Density (pcf)	108.7		106.2	
Saturation (%)	ASSUMED SG= 2.7	84	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	4:19:11		9.7	1.58	21	15				
	2-1-08	4:33:41	0:14:30	9.4	1.59	21	14	1.8E-08	0.976	1.8E-08	
	2-1-08	4:38:51	0:19:40	9.3	1.60	21	14	1.8E-08	0.976	1.8E-08	
	2-1-08	4:44:05	0:24:54	9.2	1.60	21	14	1.8E-08	0.976	1.8E-08	
	2-1-08	4:49:29	0:30:18	9.1	1.61	21	14	1.8E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-13</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.930	7.442	2.909	7.389
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 120.8    DW= 93.1	29.8	WW= 165.7    DW= 132.0	25.5
Sample Wet Weight (grams)	604.4		602.5	
Wet Density (pcf)	122.4		123.4	
Dry Density (pcf)	94.3		98.3	
Saturation (%)	ASSUMED SG= 2.7	102	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)    75		Influent Pressure (psi)    60				Effluent Pressure (psi)    60				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	2:20:42		10.0	1.98	21	15			
	2-6-08	2:45:15	0:24:33	9.0	2.03	21	13	3.8E-08	0.976	3.7E-08
	2-6-08	2:48:05	0:27:23	8.9	2.03	21	13	3.8E-08	0.976	3.7E-08
	2-6-08	2:51:08	0:30:26	8.8	2.03	21	13	3.7E-08	0.976	3.6E-08
	2-6-08	2:54:17	0:33:35	8.7	2.04	21	13	3.7E-08	0.976	3.6E-08

**HYDRAULIC CONDUCTIVITY (k)    3.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-14</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.936	7.457	2.876	7.305
Sample Diameter	2.862	7.269	2.842	7.219
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 130.0 DW= 102.8	26.5	WW= 203.0 DW= 160.2	26.7
Sample Wet Weight (grams)	585.4		579.1	
Wet Density (pcf)	118.1		120.9	
Dry Density (pcf)	93.4		95.4	
Saturation (%)	ASSUMED SG= 2.7	89	94	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	3:11:10		9.6	1.58	21	15			
	2-6-08	3:34:43	0:23:33	8.0	1.65	21	12	6.6E-08	0.976	6.4E-08
	2-6-08	3:36:38	0:25:28	7.9	1.65	21	12	6.5E-08	0.976	6.4E-08
	2-6-08	3:38:30	0:27:20	7.8	1.66	21	12	6.5E-08	0.976	6.3E-08
	2-6-08	3:40:26	0:29:16	7.7	1.66	21	11	6.5E-08	0.976	6.3E-08

**HYDRAULIC CONDUCTIVITY (k)      6.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-1-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.939	7.465	2.903	7.374
Sample Diameter	2.850	7.239	2.844	7.224
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 127.6    DW= 102.9	24.0	WW= 232.4    DW= 186.8	24.4
Sample Wet Weight (grams)	619.9		616.2	
Wet Density (pcf)	126.0		127.3	
Dry Density (pcf)	101.6		102.3	
Saturation (%)	ASSUMED SG= 2.7    98		102	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-4-08	1:01:45		9.6	1.58	22	15				
	3-4-08	1:23:53	0:22:08	8.8	1.62	22	13	3.3E-08	0.953	3.2E-08	
	3-4-08	1:26:58	0:25:13	8.7	1.62	22	13	3.3E-08	0.953	3.2E-08	
	3-4-08	1:30:17	0:28:32	8.6	1.63	22	13	3.3E-08	0.953	3.1E-08	
	3-4-08	1:33:39	0:31:54	8.5	1.63	22	13	3.3E-08	0.953	3.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-1-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-16</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.920	7.417	2.894	7.351
Sample Diameter	2.858	7.259	2.841	7.216
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 185.8    DW= 150.9	23.1	WW= 201.7    DW= 164.9	22.3
Sample Wet Weight (grams)	616.2		613.2	
Wet Density (pcf)	125.3		127.3	
Dry Density (pcf)	101.8		104.1	
Saturation (%)	ASSUMED SG= 2.7    95		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-4-08	1:01:05		10.0	1.98	22	15				
	3-4-08	1:20:14	0:19:09	9.2	2.02	22	14	3.8E-08	0.953	3.6E-08	
	3-4-08	1:22:51	0:21:46	9.1	2.02	22	13	3.8E-08	0.953	3.6E-08	
	3-4-08	1:25:29	0:24:24	9.0	2.03	22	13	3.8E-08	0.953	3.6E-08	
	3-4-08	1:28:15	0:27:10	8.9	2.03	22	13	3.8E-08	0.953	3.6E-08	

**HYDRAULIC CONDUCTIVITY (k)    3.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-2-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.010	7.645	2.969	7.541
Sample Diameter	2.855	7.252	2.851	7.242
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 130.3    DW= 105.9	23.0	WW= 200.3    DW= 163.6	22.4
Sample Wet Weight (grams)	631.7		633.6	
Wet Density (pcf)	124.9		127.3	
Dry Density (pcf)	101.5		104.0	
Saturation (%)	94		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	4:18:50		10.2	1.98	21	15				
	2-1-08	4:34:44	0:15:54	9.3	2.01	21	13	5.2E-08	0.976	5.1E-08	
	2-1-08	4:36:35	0:17:45	9.2	2.02	21	13	5.2E-08	0.976	5.1E-08	
	2-1-08	4:38:28	0:19:38	9.1	2.02	21	13	5.2E-08	0.976	5.1E-08	
	2-1-08	4:40:31	0:21:41	9.0	2.03	21	13	5.2E-08	0.976	5.1E-08	

**HYDRAULIC CONDUCTIVITY (k)    5.1E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-2</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.874	7.300	2.859	7.262
Sample Diameter	2.859	7.262	2.850	7.239
Length/Diameter Ratio		1.01		
Moisture Content (%)	WW= 155.0 DW= 127.8	21.3	WW= 219.6 DW= 181.1	21.3
Sample Wet Weight (grams)	610.5		614.9	
Wet Density (pcf)	126.1		128.4	
Dry Density (pcf)	103.9		105.9	
Saturation (%)	ASSUMED SG= 2.7	93	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-1-08	9:26:58		9.5	1.59	21	15			
	2-1-08	9:47:13	0:20:15	9.0	1.61	21	14	2.2E-08	0.976	2.1E-08
	2-1-08	9:51:25	0:24:27	8.9	1.61	21	14	2.2E-08	0.976	2.1E-08
	2-1-08	9:55:39	0:28:41	8.8	1.62	21	14	2.2E-08	0.976	2.1E-08
	2-1-08	10:00:21	0:33:23	8.7	1.62	21	14	2.2E-08	0.976	2.1E-08

**HYDRAULIC CONDUCTIVITY (k)      2.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-3</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.930	7.442	2.901	7.369
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 93.2    DW= 76.5	21.8	WW= 186.5    DW= 152.2	22.5
Sample Wet Weight (grams)	612.6		614.7	
Wet Density (pcf)	124.1		126.3	
Dry Density (pcf)	101.8		103.0	
Saturation (%)	ASSUMED SG= 2.7	90	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	10:23:57		10.0	1.98	21	15				
	2-1-08	10:41:10	0:17:13	9.3	2.01	21	14	3.7E-08	0.976	3.6E-08	
	2-1-08	10:43:48	0:19:51	9.2	2.02	21	13	3.7E-08	0.976	3.6E-08	
	2-1-08	10:46:32	0:22:35	9.1	2.02	21	13	3.7E-08	0.976	3.6E-08	
	2-1-08	10:49:26	0:25:29	9.0	2.03	21	13	3.6E-08	0.976	3.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-4</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.922	7.422	2.906	7.381
Sample Diameter	2.862	7.269	2.861	7.267
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 138.0    DW= 112.8	22.3	WW= 209.1    DW= 171.5	21.9
Sample Wet Weight (grams)	626.4		627.4	
Wet Density (pcf)	126.9		127.9	
Dry Density (pcf)	103.8		104.9	
Saturation (%)	ASSUMED SG= 2.7	97	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	3:35:07		9.6	1.58	21	15				
	2-4-08	4:06:58	0:31:51	8.6	1.63	21	13	2.9E-08	0.976	2.8E-08	
	2-4-08	4:07:10	0:32:03	8.5	1.63	21	13	3.2E-08	0.976	3.1E-08	
	2-4-08	4:10:29	0:35:22	8.4	1.63	21	13	3.2E-08	0.976	3.1E-08	
	2-4-08	4:13:51	0:38:44	8.3	1.64	21	13	3.2E-08	0.976	3.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-5</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.924	7.427	2.915	7.404
Sample Diameter	2.859	7.262	2.844	7.224
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 168.2 DW= 141.7	18.7	WW= 220.2 DW= 172.6	27.6
Sample Wet Weight (grams)	605.0		610.2	
Wet Density (pcf)	122.8		125.5	
Dry Density (pcf)	103.4		98.4	
Saturation (%)	ASSUMED SG= 2.7 80		105	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	11:15:29		10.0	1.98	21	15				
	2-4-08	11:40:11	0:24:42	8.4	2.05	21	12	6.3E-08	0.976	6.1E-08	
	2-4-08	11:41:55	0:26:26	8.3	2.05	21	12	6.3E-08	0.976	6.1E-08	
	2-4-08	11:43:48	0:28:19	8.2	2.06	21	12	6.3E-08	0.976	6.1E-08	
	2-4-08	11:45:45	0:30:16	8.1	2.06	21	11	6.2E-08	0.976	6.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      6.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-6</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.924	7.427	2.889	7.338
Sample Diameter	2.860	7.264	2.854	7.249
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 173.2    DW= 142.8	21.3	WW= 202.1    DW= 165.1	22.4
Sample Wet Weight (grams)	621.7		623.0	
Wet Density (pcf)	126.1		128.4	
Dry Density (pcf)	104.0		104.9	
Saturation (%)	ASSUMED SG= 2.7	93	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	2:48:34		9.6	1.58	21	15				
	2-8-08	3:14:17	0:25:43	9.1	1.61	21	14	1.7E-08	0.976	1.7E-08	
	2-8-08	3:19:30	0:30:56	9.0	1.61	21	14	1.7E-08	0.976	1.7E-08	
	2-8-08	3:24:56	0:36:22	8.9	1.61	21	14	1.7E-08	0.976	1.7E-08	
	2-8-08	3:30:39	0:42:05	8.8	1.62	21	14	1.7E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.7E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-7</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.941	7.470	2.919	7.414
Sample Diameter	2.858	7.259	2.852	7.244
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 139.1 DW= 112.0	24.2	WW= 183.7 DW= 148.2	24.0
Sample Wet Weight (grams)	612.7		615.2	
Wet Density (pcf)	123.7		125.7	
Dry Density (pcf)	99.6		101.4	
Saturation (%)	ASSUMED SG= 2.7 94		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) <b>85</b>		Influent Pressure (psi) <b>70</b>			Effluent Pressure (psi) <b>70</b>					
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	2:40:11		10.0	1.98	21	15			
	2-8-08	3:05:12	0:25:01	9.0	2.03	21	13	3.7E-08	0.976	3.6E-08
	2-8-08	3:08:26	0:28:15	8.9	2.03	21	13	3.7E-08	0.976	3.6E-08
	2-8-08	3:11:47	0:31:36	8.8	2.03	21	13	3.6E-08	0.976	3.5E-08
	2-8-08	3:15:06	0:34:55	8.7	2.04	21	12	3.5E-08	0.976	3.5E-08

**HYDRAULIC CONDUCTIVITY (k)      3.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-8</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.986	7.584	2.949	7.490
Sample Diameter	2.854	7.249	2.841	7.216
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 130.4	DW= 106.5	22.4	WW= 214.5 DW= 175.7 22.1
Sample Wet Weight (grams)	628.7		627.4	
Wet Density (pcf)	125.4		127.9	
Dry Density (pcf)	102.4		104.7	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	3:33:36		9.8	1.58	21	15				
	2-8-08	3:59:27	0:25:51	9.0	1.61	21	14	2.8E-08	0.976	2.7E-08	
	2-8-08	4:02:41	0:29:05	8.9	1.61	21	13	2.8E-08	0.976	2.8E-08	
	2-8-08	4:06:04	0:32:28	8.8	1.62	21	13	2.8E-08	0.976	2.8E-08	
	2-8-08	4:09:44	0:36:08	8.7	1.62	21	13	2.8E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-9</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.967	7.536	2.927	7.435
Sample Diameter	2.861	7.267	2.852	7.244
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 129.8 DW= 104.8	23.9	WW= 203.5 DW= 164.4	23.8
Sample Wet Weight (grams)	617.9		618.8	
Wet Density (pcf)	123.4		126.1	
Dry Density (pcf)	99.6		101.8	
Saturation (%)	ASSUMED SG= 2.7 93		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	3:19:40		10.1	1.98	21	15				
	2-8-08	3:48:05	0:28:25	9.3	2.01	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	3:51:27	0:31:47	9.2	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	3:55:11	0:35:31	9.1	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	3:59:26	0:39:46	9.0	2.03	21	13	2.6E-08	0.976	2.5E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-10</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.873	7.297	2.843	7.221
Sample Diameter	2.855	7.252	2.852	7.244
Length/Diameter Ratio		1.01		
Moisture Content (%)	WW= 179.2    DW= 148.3	20.8	WW= 210.6    DW= 172.4	22.2
Sample Wet Weight (grams)	605.5		604.4	
Wet Density (pcf)	125.4		126.8	
Dry Density (pcf)	103.8		103.8	
Saturation (%)	ASSUMED SG= 2.7	90	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	4:16:17		9.4	1.59	21	15			
	2-8-08	4:29:11	0:12:54	8.9	1.61	21	14	3.5E-08	0.976	3.4E-08
	2-8-08	4:31:51	0:15:34	8.8	1.62	21	14	3.5E-08	0.976	3.4E-08
	2-8-08	4:34:45	0:18:28	8.7	1.62	21	14	3.5E-08	0.976	3.4E-08
	2-8-08	4:37:39	0:21:22	8.6	1.63	21	13	3.5E-08	0.976	3.4E-08

**HYDRAULIC CONDUCTIVITY (k)      3.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-11</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.015	7.658	2.973	7.551
Sample Diameter	2.860	7.264	2.845	7.226
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 135.9 DW= 109.9	23.7	WW= 204.1 DW= 164.5	24.1
Sample Wet Weight (grams)	630.3		629.6	
Wet Density (pcf)	124.0		126.9	
Dry Density (pcf)	100.3		102.3	
Saturation (%)	ASSUMED SG= 2.7	94	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	4:01:37		10.2	1.98	21	15			
	2-8-08	4:29:13	0:27:36	9.4	2.01	21	13	2.7E-08	0.976	2.6E-08
	2-8-08	4:32:23	0:30:46	9.3	2.01	21	13	2.7E-08	0.976	2.6E-08
	2-8-08	4:35:56	0:34:19	9.2	2.02	21	13	2.7E-08	0.976	2.6E-08
	2-8-08	4:39:29	0:37:52	9.1	2.02	21	13	2.7E-08	0.976	2.6E-08

**HYDRAULIC CONDUCTIVITY (k)      2.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-12</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.916	7.407	2.879	7.313
Sample Diameter	2.861	7.267	2.853	7.247
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 142.6 DW= 115.2	23.8	WW= 235.4 DW= 191.0	23.2
Sample Wet Weight (grams)	611.4		611.4	
Wet Density (pcf)	124.2		126.5	
Dry Density (pcf)	100.4		102.7	
Saturation (%)	ASSUMED SG= 2.7	95	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) 85		Influent Pressure (psi) 70				Effluent Pressure (psi) 70				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	4:42:33		9.6	1.58	21	15			
	2-8-08	5:17:51	0:35:18	8.6	1.63	21	13	2.6E-08	0.976	2.5E-08
	2-8-08	5:21:45	0:39:12	8.5	1.63	21	13	2.6E-08	0.976	2.5E-08
	2-8-08	5:25:58	0:43:25	8.4	1.63	21	13	2.6E-08	0.976	2.5E-08
	2-8-08	5:30:26	0:47:53	8.3	1.64	21	13	2.6E-08	0.976	2.5E-08

**HYDRAULIC CONDUCTIVITY (k) 2.5E-08 cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-13</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.992	7.600	2.962	7.523
Sample Diameter	2.856	7.254	2.847	7.231
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 109.9    DW= 87.5	25.6	WW= 193.4    DW= 159.1	21.6
Sample Wet Weight (grams)	633.4		633.3	
Wet Density (pcf)	125.9		127.9	
Dry Density (pcf)	100.2		105.3	
Saturation (%)	ASSUMED SG= 2.7	102	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	4:42:15		10.2	1.98	21	15				
	2-8-08	5:18:23	0:36:08	9.2	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	5:21:53	0:39:38	9.1	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	5:25:19	0:43:04	9.0	2.03	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	5:29:22	0:47:07	8.9	2.03	21	13	2.6E-08	0.976	2.5E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-8-08

TESTED BY: JOHN MATHIEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-14</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.914	7.402	2.846	7.229
Sample Diameter	2.862	7.269	2.854	7.249
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 141.1    DW= 114.3	23.4	WW= 227.6    DW= 184.4	23.4
Sample Wet Weight (grams)	612.8		614.0	
Wet Density (pcf)	124.5		128.5	
Dry Density (pcf)	100.9		104.1	
Saturation (%)	ASSUMED SG= 2.7    94		102	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-11-08	1:42:48		9.6	1.58	22	15				
	2-11-08	2:13:07	0:30:19	8.6	1.63	22	13	3.0E-08	0.953	2.9E-08	
	2-11-08	2:16:24	0:33:36	8.5	1.63	22	13	3.0E-08	0.953	2.9E-08	
	2-11-08	2:19:50	0:37:02	8.4	1.63	22	13	3.0E-08	0.953	2.9E-08	
	2-11-08	2:23:38	0:40:50	8.3	1.64	22	13	3.0E-08	0.953	2.9E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.9E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-8-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.978	7.564	2.959	7.516
Sample Diameter	2.862	7.269	2.849	7.236
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 143.2    DW= 116.5	22.9	WW= 209.5    DW= 170.2	23.1
Sample Wet Weight (grams)	625.5		627.4	
Wet Density (pcf)	124.4		126.7	
Dry Density (pcf)	101.2		102.9	
Saturation (%)	ASSUMED SG= 2.7    93		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-12-08	12:32:44		9.7	1.58	21	15				
	2-12-08	13:09:08	0:36:24	9.0	1.61	21	14	1.7E-08	0.976	1.7E-08	
	2-12-08	13:14:37	0:41:53	8.9	1.61	21	13	1.7E-08	0.976	1.7E-08	
	2-12-08	13:20:13	0:47:29	8.8	1.62	21	13	1.7E-08	0.976	1.7E-08	
	2-12-08	13:26:09	0:53:25	8.7	1.62	21	13	1.7E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.7E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-1-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-16</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.907	7.384	2.887	7.333
Sample Diameter	2.859	7.262	2.842	7.219
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 116.4    DW= 95.0	22.5	WW= 254.9    DW= 208.6	22.2
Sample Wet Weight (grams)	608.6		606.4	
Wet Density (pcf)	124.2		126.1	
Dry Density (pcf)	101.4		103.2	
Saturation (%)	ASSUMED SG= 2.7    92		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-4-08	1:39:24		9.9	1.99	22	15				
	3-4-08	1:59:37	0:20:13	9.3	2.01	22	14	2.7E-08	0.953	2.6E-08	
	3-4-08	2:02:56	0:23:32	9.2	2.02	22	14	2.7E-08	0.953	2.6E-08	
	3-4-08	2:06:19	0:26:55	9.1	2.02	22	13	2.7E-08	0.953	2.6E-08	
	3-4-08	2:10:06	0:30:42	9.0	2.03	22	13	2.7E-08	0.953	2.6E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-3-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.952	7.498	2.944	7.478
Sample Diameter	2.860	7.264	2.841	7.216
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 123.5    DW= 101.9	21.2	WW= 240.0    DW= 197.8	21.3
Sample Wet Weight (grams)	635.6		636.7	
Wet Density (pcf)	127.7		130.0	
Dry Density (pcf)	105.3		107.1	
Saturation (%)	96		101	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	2:50:33		9.7	1.58	21	15				
	2-4-08	3:21:42	0:31:09	9.0	1.61	21	14	2.0E-08	0.976	2.0E-08	
	2-4-08	3:26:10	0:35:37	8.9	1.61	21	14	2.0E-08	0.976	2.0E-08	
	2-4-08	3:31:55	0:41:22	8.8	1.62	21	13	2.0E-08	0.976	1.9E-08	
	2-4-08	3:37:40	0:47:07	8.7	1.62	21	13	2.0E-08	0.976	1.9E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-2</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.987	7.587	2.982	7.574
Sample Diameter	2.861	7.267	2.854	7.249
Length/Diameter Ratio	1.04			
Moisture Content (%)	WW= 102.5    DW= 83.6	22.6	WW= 216.1    DW= 173.3	24.7
Sample Wet Weight (grams)	624.5		628.4	
Wet Density (pcf)	123.9		125.5	
Dry Density (pcf)	101.0		100.6	
Saturation (%)	ASSUMED SG= 2.7	91	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-4-08	4:30:12		10.2	1.98	21	15			
	2-4-08	5:06:31	0:36:19	9.3	2.01	21	13	2.3E-08	0.976	2.2E-08
	2-4-08	5:10:39	0:40:27	9.2	2.02	21	13	2.3E-08	0.976	2.2E-08
	2-4-08	5:14:55	0:44:43	9.1	2.02	21	13	2.3E-08	0.976	2.2E-08
	2-4-08	5:19:27	0:49:15	9.0	2.03	21	13	2.3E-08	0.976	2.2E-08

**HYDRAULIC CONDUCTIVITY (k)      2.2E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-3</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.988	7.590	2.975	7.557
Sample Diameter	2.861	7.267	2.860	7.264
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 114.3    DW= 93.5	22.2	WW= 207.1    DW= 168.5	22.9
Sample Wet Weight (grams)	631.4		635.4	
Wet Density (pcf)	125.2		126.7	
Dry Density (pcf)	102.4		103.0	
Saturation (%)	ASSUMED SG= 2.7	93	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	4:55:33		9.8	1.58	21	15				
	2-4-08	5:29:16	0:33:43	8.6	1.63	21	13	3.3E-08	0.976	3.2E-08	
	2-4-08	5:31:30	0:35:57	8.5	1.63	21	13	3.4E-08	0.976	3.3E-08	
	2-4-08	5:34:51	0:39:18	8.4	1.63	21	12	3.4E-08	0.976	3.3E-08	
	2-4-08	5:38:09	0:42:36	8.3	1.64	21	12	3.4E-08	0.976	3.3E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.3E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-4</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.967	7.536	2.944	7.478
Sample Diameter	2.860	7.264	2.857	7.257
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 166.9    DW= 135.7	23.0	WW= 206.0    DW= 164.6	25.2
Sample Wet Weight (grams)	614.1		616.9	
Wet Density (pcf)	122.7		124.5	
Dry Density (pcf)	99.8		99.5	
Saturation (%)	ASSUMED SG= 2.7    90		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	2:49:47		10.1	1.98	21	15				
	2-4-08	3:09:12	0:19:25	9.3	2.01	21	13	3.8E-08	0.976	3.7E-08	
	2-4-08	3:11:53	0:22:06	9.3	2.01	21	13	3.3E-08	0.976	3.2E-08	
	2-4-08	3:14:45	0:24:58	9.2	2.02	21	13	3.3E-08	0.976	3.2E-08	
	2-4-08	3:17:48	0:28:01	9.1	2.02	21	13	3.3E-08	0.976	3.2E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.3E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-5</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.945	7.480	2.933	7.450
Sample Diameter	2.861	7.267	2.861	7.267
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 145.3    DW= 117.2	24.0	WW= 234.7    DW= 189.6	23.8
Sample Wet Weight (grams)	615.8		620.5	
Wet Density (pcf)	123.9		125.4	
Dry Density (pcf)	99.9		101.3	
Saturation (%)	ASSUMED SG= 2.7	94	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-5-08	8:19:13		10.0	1.98	21	15				
	2-5-08	8:51:03	0:31:50	9.0	2.03	21	13	2.9E-08	0.976	2.9E-08	
	2-5-08	8:54:33	0:35:20	8.9	2.03	21	13	2.9E-08	0.976	2.8E-08	
	2-5-08	8:58:05	0:38:52	8.8	2.03	21	13	2.9E-08	0.976	2.8E-08	
	2-5-08	9:01:42	0:42:29	8.7	2.04	21	12	2.9E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-6</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.716	6.899	2.696	6.848
Sample Diameter	2.853	7.247	2.859	7.262
Length/Diameter Ratio		0.95		
Moisture Content (%)	WW= 134.5    DW= 112.6	19.4	WW= 218.4    DW= 181.0	20.7
Sample Wet Weight (grams)	568.5		574.4	
Wet Density (pcf)	124.7		126.4	
Dry Density (pcf)	104.4		104.8	
Saturation (%)	ASSUMED SG= 2.7    86		92	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**(PERMOMETER)**

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-13-08	1:58:03		9.0	1.61	21	15				
	2-13-08	2:27:18	0:29:15	8.4	1.63	21	14	1.9E-08	0.976	1.8E-08	
	2-13-08	2:32:54	0:34:51	8.3	1.64	21	14	1.8E-08	0.976	1.8E-08	
	2-13-08	2:38:49	0:40:46	8.2	1.64	21	13	1.8E-08	0.976	1.8E-08	
	2-13-08	2:45:27	0:47:24	8.1	1.65	21	13	1.8E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-7</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.959	7.516	2.960	7.518
Sample Diameter	2.842	7.219	2.861	7.267
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 149.2    DW= 123.9	20.4	WW= 238.4    DW= 196.9	21.1
Sample Wet Weight (grams)	635.0		640.1	
Wet Density (pcf)	128.9		128.1	
Dry Density (pcf)	107.0		105.8	
Saturation (%)	96		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	2:27:00		10.1	1.98	21	15			
	2-13-08	3:01:56	0:34:56	9.1	2.02	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:05:31	0:38:31	9.0	2.03	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:09:28	0:42:28	8.9	2.03	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:13:45	0:46:45	8.8	2.03	21	13	2.7E-08	0.976	2.6E-08

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>2.6E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-8</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.930	7.442
Sample Diameter	2.860	7.264	2.864	7.275
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 115.4    DW= 93.9	22.9	WW= 228.7    DW= 185.8	23.1
Sample Wet Weight (grams)	628.1		630.5	
Wet Density (pcf)	126.9		127.2	
Dry Density (pcf)	103.3		103.4	
Saturation (%)	ASSUMED SG= 2.7	98	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	2:47:17		9.6	1.58	21	15			
	2-13-08	3:25:26	0:38:09	8.5	1.63	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:29:18	0:42:01	8.4	1.63	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:33:47	0:46:30	8.3	1.64	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:38:24	0:51:07	8.2	1.64	21	12	2.6E-08	0.976	2.6E-08

**HYDRAULIC CONDUCTIVITY (k)      2.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-9</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.992	7.600	2.996	7.610
Sample Diameter	2.853	7.247	2.855	7.252
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 99.9    DW= 83.1	20.2	WW= 227.4    DW= 187.5	21.3
Sample Wet Weight (grams)	634.7		637.7	
Wet Density (pcf)	126.4		126.7	
Dry Density (pcf)	105.2		104.4	
Saturation (%)	ASSUMED SG= 2.7	91	94	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85	Influent Pressure (psi)		70	Effluent Pressure (psi)		70			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-13-08	3:24:51		10.2	1.98	21	15				
	2-13-08	4:02:10	0:37:19	8.4	2.05	21	12	4.7E-08	0.976	4.6E-08	
	2-13-08	4:04:56	0:40:05	8.3	2.05	21	12	4.7E-08	0.976	4.6E-08	
	2-13-08	4:07:48	0:42:57	8.2	2.06	21	11	4.6E-08	0.976	4.5E-08	
	2-13-08	4:10:55	0:46:04	8.1	2.06	21	11	4.6E-08	0.976	4.5E-08	

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>4.6E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-10</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.965	7.531	2.944	7.478
Sample Diameter	2.861	7.267	2.861	7.267
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 133.9    DW= 108.6	23.3	WW= 248.4    DW= 200.9	23.6
Sample Wet Weight (grams)	630.4		632.4	
Wet Density (pcf)	126.0		127.3	
Dry Density (pcf)	102.2		103.0	
Saturation (%)	ASSUMED SG= 2.7 97		100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**(PERMOMETER)**

Confining Pressure (psi) <b>85</b>		Influent Pressure (psi) <b>70</b>				Effluent Pressure (psi) <b>70</b>				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	3:50:31		9.7	1.58	21	15			
	2-13-08	4:18:44	0:28:13	9.2	1.60	21	14	1.6E-08	0.976	1.5E-08
	2-13-08	4:24:35	0:34:04	9.1	1.61	21	14	1.6E-08	0.976	1.5E-08
	2-13-08	4:30:54	0:40:23	9.0	1.61	21	14	1.6E-08	0.976	1.5E-08
	2-13-08	4:37:17	0:46:46	8.9	1.61	21	14	1.6E-08	0.976	1.5E-08

**HYDRAULIC CONDUCTIVITY (k)      1.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-11</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.955	7.506	2.927	7.435
Sample Diameter	2.859	7.262	2.848	7.234
Length/Diameter Ratio	1.03			
Moisture Content (%)	WW= 130.3    DW= 106.8	22.0	WW= 220.7    DW= 178.8	23.4
Sample Wet Weight (grams)	617.3		618.0	
Wet Density (pcf)	124.0		126.3	
Dry Density (pcf)	101.6		102.3	
Saturation (%)	ASSUMED SG= 2.7	90	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-13-08	12:51:08		10.1	1.98	21	15				
	2-13-08	13:21:23	0:30:15	9.6	2.00	21	14	1.5E-08	0.976	1.4E-08	
	2-13-08	13:27:42	0:36:34	9.5	2.01	21	14	1.5E-08	0.976	1.4E-08	
	2-13-08	13:34:05	0:42:57	9.4	2.01	21	14	1.5E-08	0.976	1.4E-08	
	2-13-08	13:40:58	0:49:50	9.3	2.01	21	14	1.5E-08	0.976	1.4E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-12</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.950	7.493	2.924	7.427
Sample Diameter	2.858	7.259	2.852	7.244
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 178.8    DW= 143.7	24.4	WW= 247.7    DW= 202.1	22.6
Sample Wet Weight (grams)	615.5		616.5	
Wet Density (pcf)	123.9		125.7	
Dry Density (pcf)	99.6		102.6	
Saturation (%)	ASSUMED SG= 2.7    95		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**(PERMOMETER)**

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	12:51:52		9.7	1.58	21	15			
	2-13-08	13:32:15	0:40:23	9.1	1.61	21	14	1.3E-08	0.976	1.3E-08
	2-13-08	13:38:56	0:47:04	9.0	1.61	21	14	1.3E-08	0.976	1.3E-08
	2-13-08	13:46:25	0:54:33	8.9	1.61	21	14	1.3E-08	0.976	1.3E-08
	2-13-08	13:55:18	1:03:26	8.8	1.62	21	13	1.3E-08	0.976	1.3E-08

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>1.3E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-13</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.982	7.574	2.986	7.584
Sample Diameter	2.856	7.254	2.854	7.249
Length/Diameter Ratio	1.04			
Moisture Content (%)	WW= 132.5    DW= 108.1	22.6	WW= 276.8    DW= 227.7	21.6
Sample Wet Weight (grams)	636.5		641.0	
Wet Density (pcf)	126.9		127.8	
Dry Density (pcf)	103.6		105.2	
Saturation (%)	ASSUMED SG= 2.7	97	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-14-08	2:00:28		9.7	1.58	21	15				
	2-14-08	2:16:48	0:16:20	8.8	1.62	21	13	5.1E-08	0.976	5.0E-08	
	2-14-08	2:18:50	0:18:22	8.7	1.62	21	13	5.1E-08	0.976	5.0E-08	
	2-14-08	2:20:55	0:20:27	8.6	1.63	21	13	5.1E-08	0.976	4.9E-08	
	2-14-08	2:23:02	0:22:34	8.5	1.63	21	13	5.0E-08	0.976	4.9E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.9E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-14</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.975	7.557	2.975	7.557
Sample Diameter	2.853	7.247	2.848	7.234
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 131.5    DW= 107.8	22.0	WW= 245.4    DW= 198.2	23.8
Sample Wet Weight (grams)	626.1		629.9	
Wet Density (pcf)	125.4		126.6	
Dry Density (pcf)	102.8		102.3	
Saturation (%)	ASSUMED SG= 2.7    93		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	1:22:08		9.7	1.58	22	15				
	2-20-08	1:42:18	0:20:10	8.9	1.61	22	13	3.6E-08	0.953	3.5E-08	
	2-20-08	1:45:20	0:23:12	8.8	1.62	22	13	3.6E-08	0.953	3.4E-08	
	2-20-08	1:47:49	0:25:41	8.7	1.62	22	13	3.6E-08	0.953	3.5E-08	
	2-20-08	1:50:43	0:28:35	8.6	1.63	22	13	3.6E-08	0.953	3.4E-08	

**HYDRAULIC CONDUCTIVITY (k)    3.4E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-4-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.986	7.584	2.941	7.470
Sample Diameter	2.871	7.292	2.855	7.252
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 109.3    DW= 88.6	23.4	WW= 237.2    DW= 191.0	24.2
Sample Wet Weight (grams)	613.2		612.3	
Wet Density (pcf)	120.8		123.9	
Dry Density (pcf)	98.0		99.8	
Saturation (%)	ASSUMED SG= 2.7    88		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
(PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-5-08	3:02:47		9.8	1.58	22	15				
	3-5-08	3:17:23	0:14:36	9.0	1.61	22	14	4.9E-08	0.953	4.7E-08	
	3-5-08	3:19:21	0:16:34	8.9	1.61	22	13	4.9E-08	0.953	4.7E-08	
	3-5-08	3:21:29	0:18:42	8.8	1.62	22	13	4.9E-08	0.953	4.6E-08	
	3-5-08	3:23:41	0:20:54	8.7	1.62	22	13	4.8E-08	0.953	4.6E-08	

**HYDRAULIC CONDUCTIVITY (k)    4.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-16</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.919	7.414
Sample Diameter	2.851	7.242	2.856	7.254
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 138.0    DW= 109.3	26.3	WW= 213.3    DW= 168.4	26.7
Sample Wet Weight (grams)	596.5		601.4	
Wet Density (pcf)	121.3		122.5	
Dry Density (pcf)	96.1		96.7	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-18-08	3:31:54		10.0	1.98	22	15				
	3-18-08	3:53:35	0:21:41	9.3	2.01	22	14	2.9E-08	0.953	2.8E-08	
	3-18-08	3:56:41	0:24:47	9.2	2.02	22	13	3.0E-08	0.953	2.8E-08	
	3-18-08	4:00:13	0:28:19	9.1	2.02	22	13	2.9E-08	0.953	2.8E-08	
	3-18-08	4:03:56	0:32:02	9.0	2.03	22	13	2.9E-08	0.953	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-4-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.937	7.460	2.909	7.389
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 138.5    DW= 112.4	23.2	WW= 235.5    DW= 191.7	22.8
Sample Wet Weight (grams)	616.3		616.5	
Wet Density (pcf)	124.5		126.3	
Dry Density (pcf)	101.1		102.8	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-6-08	2:59:03		10.0	1.98	21	15				
	2-6-08	3:24:35	0:25:32	9.2	2.02	21	13	2.9E-08	0.976	2.8E-08	
	2-6-08	3:27:48	0:28:45	9.1	2.02	21	13	2.9E-08	0.976	2.8E-08	
	2-6-08	3:31:05	0:32:02	9.0	2.03	21	13	2.9E-08	0.976	2.8E-08	
	2-6-08	3:34:28	0:35:25	8.9	2.03	21	13	2.9E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.8E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-2</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.940	7.468	2.912	7.396
Sample Diameter	2.861	7.267	2.852	7.244
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 130.5    DW= 105.4	23.8	WW= 204.9    DW= 165.5	23.8
Sample Wet Weight (grams)	614.7		616.5	
Wet Density (pcf)	123.9		126.2	
Dry Density (pcf)	100.1		102.0	
Saturation (%)	94		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) <b>75</b>		Influent Pressure (psi) <b>60</b>				Effluent Pressure (psi) <b>60</b>				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	3:43:16		9.6	1.58	21	15			
	2-6-08	4:06:37	0:23:21	8.4	1.63	21	13	4.8E-08	0.976	4.7E-08
	2-6-08	4:08:53	0:25:37	8.3	1.64	21	12	4.8E-08	0.976	4.7E-08
	2-6-08	4:11:19	0:28:03	8.2	1.64	21	12	4.8E-08	0.976	4.7E-08
	2-6-08	4:13:36	0:30:20	8.1	1.65	21	12	4.8E-08	0.976	4.7E-08

**HYDRAULIC CONDUCTIVITY (k)      4.7E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-3</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.011	7.648	2.912	7.396
Sample Diameter	2.859	7.262	2.852	7.244
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 160.5    DW= 131.0	22.5	WW= 221.9    DW= 180.4	23.0
Sample Wet Weight (grams)	636.7		636.7	
Wet Density (pcf)	125.5		130.4	
Dry Density (pcf)	102.4		106.0	
Saturation (%)	ASSUMED SG= 2.7	94	105	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)    75		Influent Pressure (psi)    60				Effluent Pressure (psi)    60				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	3:40:10		10.2	1.98	21	15			
	2-6-08	3:57:38	0:17:28	9.5	2.01	21	14	3.6E-08	0.976	3.6E-08
	2-6-08	4:00:15	0:20:05	9.4	2.01	21	13	3.6E-08	0.976	3.6E-08
	2-6-08	4:03:02	0:22:52	9.3	2.01	21	13	3.6E-08	0.976	3.5E-08
	2-6-08	4:05:58	0:25:48	9.2	2.02	21	13	3.6E-08	0.976	3.5E-08

**HYDRAULIC CONDUCTIVITY (k)    3.5E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-4</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.939	7.465	2.891	7.343
Sample Diameter	2.861	7.267	2.857	7.257
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 144.4    DW= 118.6	21.8	WW= 191.9    DW= 156.1	22.9
Sample Wet Weight (grams)	619.8		615.7	
Wet Density (pcf)	125.0		126.6	
Dry Density (pcf)	102.6		102.9	
Saturation (%)	92		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-6-08	9:57:40		9.6	1.58	21	15				
	2-6-08	10:21:13	0:23:33	9.0	1.61	21	14	2.3E-08	0.976	2.2E-08	
	2-6-08	10:25:34	0:27:54	8.9	1.61	21	14	2.3E-08	0.976	2.2E-08	
	2-6-08	10:30:06	0:32:26	8.8	1.62	21	13	2.3E-08	0.976	2.2E-08	
	2-6-08	10:34:51	0:37:11	8.7	1.62	21	13	2.2E-08	0.976	2.2E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.2E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-5</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.980	7.569	2.915	7.404
Sample Diameter	2.855	7.252	2.847	7.231
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 165.7    DW= 133.3	24.3	WW= 203.0    DW= 164.9	23.1
Sample Wet Weight (grams)	622.5		620.6	
Wet Density (pcf)	124.3		127.4	
Dry Density (pcf)	100.0		103.5	
Saturation (%)	ASSUMED SG= 2.7 96		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	9:57:04		10.1	1.98	21	15			
	2-6-08	10:18:56	0:21:52	9.5	2.01	21	14	2.5E-08	0.976	2.4E-08
	2-6-08	10:22:39	0:25:35	9.4	2.01	21	14	2.5E-08	0.976	2.4E-08
	2-6-08	10:26:35	0:29:31	9.3	2.01	21	13	2.5E-08	0.976	2.4E-08
	2-6-08	10:30:47	0:33:43	9.2	2.02	21	13	2.5E-08	0.976	2.4E-08

**HYDRAULIC CONDUCTIVITY (k)      2.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-6</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.939	7.465	2.900	7.366
Sample Diameter	2.870	7.290	2.858	7.259
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 133.8    DW= 107.8	24.1	WW= 257.0    DW= 207.0	24.2
Sample Wet Weight (grams)	608.9		604.5	
Wet Density (pcf)	122.0		123.8	
Dry Density (pcf)	98.3		99.7	
Saturation (%)	ASSUMED SG= 2.7    91		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-20-08	1:24:12		10.0	1.98	22	15			
	2-20-08	1:44:26	0:20:14	8.9	2.03	22	13	5.1E-08	0.953	4.8E-08
	2-20-08	1:46:41	0:22:29	8.8	2.03	22	13	5.0E-08	0.953	4.8E-08
	2-20-08	1:48:57	0:24:45	8.7	2.04	22	12	5.0E-08	0.953	4.7E-08
	2-20-08	1:51:22	0:27:10	8.6	2.04	22	12	4.9E-08	0.953	4.7E-08

**HYDRAULIC CONDUCTIVITY (k)    4.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-7</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.947	7.485	2.861	7.267
Sample Diameter	2.869	7.287	2.854	7.249
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 126.6    DW= 100.1	26.5	WW= 243.6    DW= 193.4	26.0
Sample Wet Weight (grams)	600.3		596.3	
Wet Density (pcf)	120.0		124.1	
Dry Density (pcf)	94.9		98.5	
Saturation (%)	ASSUMED SG= 2.7    92		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:06:56		9.6	1.58	22	15				
	2-20-08	2:28:34	0:21:38	8.9	1.61	22	14	2.9E-08	0.953	2.8E-08	
	2-20-08	2:31:51	0:24:55	8.8	1.62	22	13	2.9E-08	0.953	2.8E-08	
	2-20-08	2:35:19	0:28:23	8.7	1.62	22	13	2.9E-08	0.953	2.8E-08	
	2-20-08	2:38:52	0:31:56	8.6	1.63	22	13	2.9E-08	0.953	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.8E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-8</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.925	7.430	2.840	7.214
Sample Diameter	2.860	7.264	2.846	7.229
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 146.9    DW= 115.1	27.6	WW= 253.2    DW= 201.4	25.7
Sample Wet Weight (grams)	590.3		583.9	
Wet Density (pcf)	119.7		123.1	
Dry Density (pcf)	93.8		97.9	
Saturation (%)	ASSUMED SG= 2.7    94		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:09:46		10.0	1.98	22	15				
	2-20-08	2:42:29	0:32:43	9.0	2.03	22	13	2.8E-08	0.953	2.7E-08	
	2-20-08	2:45:06	0:35:20	8.9	2.03	22	13	2.9E-08	0.953	2.8E-08	
	2-20-08	2:48:53	0:39:07	8.8	2.03	22	13	2.9E-08	0.953	2.7E-08	
	2-20-08	2:52:45	0:42:59	8.7	2.04	22	13	2.9E-08	0.953	2.7E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-9</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.854	7.249
Sample Diameter	2.858	7.259	2.847	7.231
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 133.5    DW= 105.1	27.0	WW= 197.9    DW= 157.5	25.7
Sample Wet Weight (grams)	585.2		580.0	
Wet Density (pcf)	118.4		121.6	
Dry Density (pcf)	93.2		96.8	
Saturation (%) <small>ASSUMED SG= 2.7</small>	90		93	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)							
	75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:46:01		9.6	1.58	22	15				
	2-20-08	3:11:28	0:25:27	9.0	1.61	22	14	2.1E-08	0.953	2.0E-08	
	2-20-08	3:15:58	0:29:57	8.9	1.61	22	14	2.1E-08	0.953	2.0E-08	
	2-20-08	3:21:06	0:35:05	8.8	1.62	22	13	2.1E-08	0.953	2.0E-08	
	2-20-08	3:26:33	0:40:32	8.7	1.62	22	13	2.0E-08	0.953	2.0E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-10</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.940	7.468	2.869	7.287
Sample Diameter	2.863	7.272	2.848	7.234
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 136.9    DW= 108.7	25.9	WW= 205.9    DW= 159.7	28.9
Sample Wet Weight (grams)	590.7		586.3	
Wet Density (pcf)	118.9		122.2	
Dry Density (pcf)	94.4		94.8	
Saturation (%)	ASSUMED SG= 2.7    89		100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:58:29		10.0	1.98	22	15				
	2-20-08	3:19:17	0:20:48	9.0	2.03	22	13	4.5E-08	0.953	4.3E-08	
	2-20-08	3:21:25	0:22:56	8.9	2.03	22	13	4.5E-08	0.953	4.3E-08	
	2-20-08	3:23:42	0:25:13	8.8	2.03	22	13	4.5E-08	0.953	4.3E-08	
	2-20-08	3:26:09	0:27:40	8.7	2.04	22	12	4.5E-08	0.953	4.2E-08	

**HYDRAULIC CONDUCTIVITY (k)    4.3E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-11</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.898	7.361	2.830	7.188
Sample Diameter	2.859	7.262	2.849	7.236
Length/Diameter Ratio		1.01		
Moisture Content (%)	WW= 108.6    DW= 88.5	22.7	WW= 213.3    DW= 173.0	23.3
Sample Wet Weight (grams)	595.7		592.5	
Wet Density (pcf)	122.0		125.1	
Dry Density (pcf)	99.4		101.5	
Saturation (%)	ASSUMED SG= 2.7    88		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-20-08	3:32:30		9.5	1.59	22	15			
	2-20-08	3:47:23	0:14:53	8.8	1.62	22	14	4.3E-08	0.953	4.1E-08
	2-20-08	3:49:45	0:17:15	8.7	1.62	22	13	4.2E-08	0.953	4.1E-08
	2-20-08	3:52:11	0:19:41	8.6	1.63	22	13	4.2E-08	0.953	4.0E-08
	2-20-08	3:54:37	0:22:07	8.5	1.63	22	13	4.2E-08	0.953	4.0E-08

**HYDRAULIC CONDUCTIVITY (k)      4.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-12</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.870	7.290
Sample Diameter	2.859	7.262	2.846	7.229
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 153.9    DW= 124.4	23.7	WW= 228.3    DW= 180.3	26.6
Sample Wet Weight (grams)	594.3		589.5	
Wet Density (pcf)	120.2		123.0	
Dry Density (pcf)	97.2		97.1	
Saturation (%)	ASSUMED SG= 2.7    87		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-20-08	3:32:54		10.0	1.98	22	15			
	2-20-08	3:48:15	0:15:21	9.3	2.01	22	14	4.1E-08	0.953	3.9E-08
	2-20-08	3:50:36	0:17:42	9.2	2.02	22	13	4.1E-08	0.953	3.9E-08
	2-20-08	3:52:58	0:20:04	9.1	2.02	22	13	4.1E-08	0.953	3.9E-08
	2-20-08	3:55:27	0:22:33	9.0	2.03	22	13	4.1E-08	0.953	3.9E-08

**HYDRAULIC CONDUCTIVITY (k)    3.9E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. LP-4-13      SAMPLE LOCATION: LINER LIFT 4

TYPE UNDISTURBED      SAMPLE DESCRIPTION: GREY & BROWN FL. SANDY CLAY

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.976	7.559	2.937	7.460
Sample Diameter	2.857	7.257	2.856	7.254
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 121.1    DW= 97.3	24.5	WW= 246.4    DW= 197.0	25.1
Sample Wet Weight (grams)	616.4		612.9	
Wet Density (pcf)	123.1		124.1	
Dry Density (pcf)	98.9		99.2	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	4:02:33		10.1	1.98	22	15				
	2-20-08	4:22:30	0:19:57	9.5	2.01	22	14	2.7E-08	0.953	2.6E-08	
	2-20-08	4:25:46	0:23:13	9.4	2.01	22	14	2.7E-08	0.953	2.6E-08	
	2-20-08	4:29:12	0:26:39	9.3	2.01	22	13	2.8E-08	0.953	2.6E-08	
	2-20-08	4:33:05	0:30:32	9.2	2.02	22	13	2.7E-08	0.953	2.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-14</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.977	7.562	2.920	7.417
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 122.0 DW= 99.3	22.9	WW= 234.3 DW= 191.7	22.2
Sample Wet Weight (grams)	615.6		610.9	
Wet Density (pcf)	122.7		124.7	
Dry Density (pcf)	99.9		102.0	
Saturation (%)	ASSUMED SG= 2.7 90		92	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	4:03:00		9.7	1.58	22	15				
	2-20-08	4:25:16	0:22:16	9.2	1.60	22	14	2.0E-08	0.953	1.9E-08	
	2-20-08	4:30:22	0:27:22	9.1	1.61	22	14	2.0E-08	0.953	1.9E-08	
	2-20-08	4:35:54	0:32:54	9.0	1.61	22	14	1.9E-08	0.953	1.8E-08	
	2-20-08	4:41:26	0:38:26	8.9	1.61	22	13	1.9E-08	0.953	1.8E-08	

**HYDRAULIC CONDUCTIVITY (k) 1.9E-08 cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.928	7.437
Sample Diameter	2.850	7.239	2.850	7.239
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 150.8    DW= 120.0	25.7	WW= 210.1    DW= 167.1	25.7
Sample Wet Weight (grams)	605.8		602.4	
Wet Density (pcf)	123.3		122.9	
Dry Density (pcf)	98.1		97.7	
Saturation (%)	ASSUMED SG= 2.7    97		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-18-08	3:31:53		9.6	1.58	22	15				
	3-18-08	3:55:10	0:23:17	9.1	1.61	22	14	1.9E-08	0.953	1.8E-08	
	3-18-08	4:00:39	0:28:46	9.0	1.61	22	14	1.9E-08	0.953	1.8E-08	
	3-18-08	4:06:08	0:34:15	8.9	1.61	22	14	1.9E-08	0.953	1.8E-08	
	3-18-08	4:12:47	0:40:54	8.8	1.62	22	13	1.8E-08	0.953	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)    1.8E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-4-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-16</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.927	7.435	2.887	7.333
Sample Diameter	2.859	7.262	2.850	7.239
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 167.6    DW= 136.3	23.0	WW= 218.8    DW= 180.3	21.4
Sample Wet Weight (grams)	621.4		619.9	
Wet Density (pcf)	126.0		128.2	
Dry Density (pcf)	102.5		105.7	
Saturation (%)	ASSUMED SG= 2.7    96		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)    75		Influent Pressure (psi)    60				Effluent Pressure (psi)    60				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	3-5-08	3:07:01		10.0	1.98	22	15			
	3-5-08	3:23:15	0:16:14	9.4	2.01	22	14	3.3E-08	0.953	3.2E-08
	3-5-08	3:26:08	0:19:07	9.3	2.01	22	14	3.3E-08	0.953	3.2E-08
	3-5-08	3:29:13	0:22:12	9.2	2.02	22	13	3.3E-08	0.953	3.1E-08
	3-5-08	3:32:29	0:25:28	9.1	2.02	22	13	3.2E-08	0.953	3.1E-08

**HYDRAULIC CONDUCTIVITY (k)    3.1E-08    cm/sec**

**SUMMARY OF TEST RESULTS**  
**NATIVE SOIL PROTECTIVE COVER**

**SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS  
NATIVE PROTECTIVE COVER SAND**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 [667,000 sq ft ( 15.3 Acres)]: 42,100 cy native protective cover sand

SAMPLE NO.	MATERIAL DESCRIPTION	HYDRAULIC CONDUCTIVITY (ASTM D 2434)  (Dense) cm/s
PCBW-1-C12	Yellow & brown fi.-med. SAND	4.6E-03
PCBW-2-C12	Yellow & brown fi.-med. SAND	7.9E-03
PCBW-3-C12	Yellow & brown fi.-med. SAND	1.3E-02
PCBW-4-C12	Yellow & brown fi.-med. SAND	2.6E-03
PCBW-5-C12	Yellow & brown fi.-med. SAND	1.5E-02
PCBW-6-C12	Yellow & brown fi.-med. SAND	7.8E-03
PCBW-7-C12	Yellow & brown fi.-med. SAND	8.2E-03
PCBW-8-C12	Yellow & brown fi.-med. SAND	8.0E-03
PCBW-9-C12	Yellow & brown fi.-med. SAND	6.1E-03
PCBW-10-C12	Yellow & brown fi.-med. SAND	9.3 E-03
PCBW-11-C12	Yellow & brown fi.-med. SAND	6.5 E-03
PCBW-12-C12	Yellow & brown fi.-med. SAND	1.3 E-02
PCBW-13-C12	Yellow & brown fi.-med. SAND	2.1 E-03
PCBW-14-C12	Yellow & brown fi.-med. SAND	5.8E-03
PCBW-15-C12	Yellow & brown fi.-med. SAND	4.3E-03

PROJECT REQUIREMENTS:	k ≥ 1 E-03 cm/s
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-1</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.0	DW= 96.0	14.6
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1350		
Unused Wet Weight, W <sub>2</sub> (grams)	101.6		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1248.4		
Wet Density (pcf)	117.8		
Dry Density (pcf)	102.8		
Void Ratio, e	ASSUMED SG= 2.70	0.64	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
1-27-08	1	120	55.9	44.2	11.7	34	14	4.0E-03	1.165	4.7E-03
1-27-08	2	60	46.0	19.9	26.1	37	14	3.9E-03	1.165	4.6E-03
1-27-08	3	60	39.0	2.1	36.9	53	14	4.0E-03	1.165	4.6E-03

**HYDRAULIC CONDUCTIVITY                      4.6E-03                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-2</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 150.0	DW= 132.4	13.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)		1300	
Unused Wet Weight, W <sub>2</sub> (grams)		63.8	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1236.2	
Wet Density (pcf)		116.6	
Dry Density (pcf)		102.9	
Void Ratio, e	ASSUMED SG= 2.70	0.64	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-6-08	1	70	59.2	43.7	15.5	44	14	6.7E-03	1.165	7.9E-03
2-6-08	2	60	50.6	17.3	33.3	81	14	6.7E-03	1.165	7.9E-03
2-6-08	3	60	50.0	13.0	37.0	90	14	6.7E-03	1.165	7.9E-03

**HYDRAULIC CONDUCTIVITY                      7.9E-03                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

**EAST CAROLINA**  
 PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-8-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-3</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 121.3	DW= 110.3	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1200		
Unused Wet Weight, W <sub>2</sub> (grams)	115.6		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1084.4		
Wet Density (pcf)	102.3		
Dry Density (pcf)	93.0		
Void Ratio, e	0.81		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-9-08	1	60	61.2	53.7	7.5	33	16	1.2E-02	1.106	1.3E-02
4-9-08	2	60	52.2	32.8	19.4	85	16	1.2E-02	1.106	1.3E-02
4-9-08	3	48	45.7	18.0	27.7	95	16	1.2E-02	1.106	1.3E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>1.3E-02</b>	<b>cm/sec</b>
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-8-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-4</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 118.0	DW= 105.2	12.2
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1250		
Unused Wet Weight, W <sub>2</sub> (grams)	92.7		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1157.3		
Wet Density (pcf)	109.2		
Dry Density (pcf)	97.3		
Void Ratio, e	ASSUMED SG= 2.70	0.73	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-9-08	1	120	57.9	46.0	11.9	20	16	2.3E-03	1.106	2.6E-03
4-9-08	2	60	51.5	22.1	29.4	25	16	2.4E-03	1.106	2.6E-03
4-9-08	3	60	47.1	4.9	42.2	36	16	2.4E-03	1.106	2.6E-03

**HYDRAULIC CONDUCTIVITY                      2.6E-03                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-5</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 148.8	DW= 135.0	10.2
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.433		1.100
Height, H <sub>1</sub> -H <sub>2</sub>	5.693		14.460
Wet Weight, W <sub>1</sub> (grams)	1300		
Unused Wet Weight, W <sub>2</sub> (grams)	182.2		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1117.8		
Wet Density (pcf)	105.4		
Dry Density (pcf)	95.6		
Void Ratio, e	ASSUMED SG= 2.70		0.76

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-15-08	1	60	56.9	46.3	10.6	52	16	1.4E-02	1.106	1.5E-02
4-15-08	2	45	44.7	21.7	23.0	84	16	1.4E-02	1.106	1.5E-02
4-15-08	3	30	37.3	5.8	31.5	75	16	1.3E-02	1.106	1.5E-02

**HYDRAULIC CONDUCTIVITY                      1.5E-02                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-6</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM			
			inches
			centimeters
Sample Length Between Manometer Outlets			3.000
Sample Diameter			3.006
Moisture Content (%)	WW= 127.7	DW= 114.3	11.7
Height, H <sub>1</sub>			6.126
Height, H <sub>2</sub>			0.437
Height, H <sub>1</sub> -H <sub>2</sub>			5.689
Wet Weight, W <sub>1</sub> (grams)			1250
Unused Wet Weight, W <sub>2</sub> (grams)			181.3
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)			1068.7
Wet Density (pcf)			100.8
Dry Density (pcf)			90.2
Void Ratio, e	ASSUMED SG= 2.70		0.87

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-15-08	1	60	61.6	52.5	9.1	23	16	7.0E-03	1.106	7.8E-03
4-15-08	2	60	52.9	30.8	22.1	56	16	7.0E-03	1.106	7.8E-03
4-15-08	3	60	47.8	17.5	30.3	77	16	7.0E-03	1.106	7.8E-03

**HYDRAULIC CONDUCTIVITY                      7.8E-03                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-7</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches	centimeters
Sample Length Between Manometer Outlets	3.000	7.620
Sample Diameter	3.006	7.635
Moisture Content (%)	WW= 110.0      DW= 98.9	11.2
Height, H <sub>1</sub>	6.126	15.560
Height, H <sub>2</sub>	0.437	1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689	14.450
Wet Weight, W <sub>1</sub> (grams)	1300	
Unused Wet Weight, W <sub>2</sub> (grams)	173.9	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1126.1	
Wet Density (pcf)	106.2	
Dry Density (pcf)	95.5	
Void Ratio, e	0.76	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-15-08	1	60	60.7	52.5	8.2	22	16	7.4E-03	1.106	8.2E-03
4-15-08	2	60	48.8	24.5	24.3	65	16	7.4E-03	1.106	8.2E-03
4-15-08	3	60	43.2	10.5	32.7	86	16	7.3E-03	1.106	8.1E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>8.2E-03</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-8</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 136.2	DW= 124.5	9.4
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1299.8		
Unused Wet Weight, W <sub>2</sub> (grams)	184.7		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1115.1		
Wet Density (pcf)	105.2		
Dry Density (pcf)	96.1		
Void Ratio, e	0.75		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-17-08	1	60	57.9	45.8	12.1	32	16	7.3E-03	1.106	8.1E-03
4-17-08	2	60	46.8	19.1	27.7	72	16	7.2E-03	1.106	8.0E-03
4-17-08	3	60	40.4	2.6	37.8	98	16	7.2E-03	1.106	8.0E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>8.0E-03</b>	<b>cm/sec</b>
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-9</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 100.0	DW= 91.8	8.9
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1300		
Unused Wet Weight, W <sub>2</sub> (grams)	161.3		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1138.7		
Wet Density (pcf)	107.4		
Dry Density (pcf)	98.6		
Void Ratio, e	ASSUMED SG= 2.70	0.71	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-21-08	1	60	57.7	47.1	10.6	22	17	5.8E-03	1.077	6.2E-03
4-21-08	2	60	46.9	22.0	24.9	51	17	5.7E-03	1.077	6.1E-03
4-21-08	3	60	39.5	5.2	34.3	70	17	5.7E-03	1.077	6.1E-03

**HYDRAULIC CONDUCTIVITY                      6.1E-03                      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT HEAD METHOD (ASTM D 2434)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
PROJECT NO.: J07-1001-58  
DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-10</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FI.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 100.0	DW= 93.0	7.5
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)		1300	
Unused Wet Weight, W <sub>2</sub> (grams)		145.1	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1154.9	
Wet Density (pcf)		108.9	
Dry Density (pcf)		101.3	
Void Ratio, e	ASSUMED SG= 2.70	0.66	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-21-08	1	60	52.4	44.6	7.8	24	17	8.5E-03	1.077	9.2E-03
4-21-08	2	60	34.4	15.8	18.6	58	17	8.6E-03	1.077	9.3E-03
4-21-08	3	60	27.0	3.3	23.7	74	17	8.7E-03	1.077	9.3E-03

**HYDRAULIC CONDUCTIVITY                      9.3E-03                      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT HEAD METHOD (ASTM D 2434)**

**EAST CAROLINA**  
 PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-11</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 146.0	DW= 132.2	10.4
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1298.7		
Unused Wet Weight, W <sub>2</sub> (grams)	108		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1190.7		
Wet Density (pcf)	112.3		
Dry Density (pcf)	101.7		
Void Ratio, e	ASSUMED SG= 2.70		0.66

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-22-08	1	60	56.7	49.4	7.3	16	17	6.1E-03	1.077	6.5E-03
4-22-08	2	60	44.1	26.7	17.4	38	17	6.1E-03	1.077	6.5E-03
4-22-08	3	60	34.4	8.4	26.0	56	17	6.0E-03	1.077	6.4E-03

**HYDRAULIC CONDUCTIVITY      6.5E-03      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-12</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FI-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 123.3	DW= 111.0	11.1
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)		1227.8	
Unused Wet Weight, W <sub>2</sub> (grams)		95.7	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1132.1	
Wet Density (pcf)		106.8	
Dry Density (pcf)		96.1	
Void Ratio, e	ASSUMED SG= 2.70	0.75	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-22-08	1	60	55.4	45.4	10.0	45	17	1.2E-02	1.077	1.3E-02
4-22-08	2	60	44.3	22.8	21.5	92	17	1.2E-02	1.077	1.3E-02
4-22-08	3	40	37.2	6.8	30.4	83	17	1.1E-02	1.077	1.2E-02

**HYDRAULIC CONDUCTIVITY                      1.3E-02                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-13</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 202.0	DW= 183.1	10.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.531		1.350
Height, H <sub>1</sub> -H <sub>2</sub>	5.595		14.210
Wet Weight, W <sub>1</sub> (grams)	1537.5		
Unused Wet Weight, W <sub>2</sub> (grams)	299.8		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1237.7		
Wet Density (pcf)	118.7		
Dry Density (pcf)	107.6		
Void Ratio, e	ASSUMED SG= 2.70	0.57	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
5-1-08	1	120	60.0	51.5	8.5	12	17	2.0E-03	1.077	2.1E-03
5-1-08	2	120	59.8	50.4	9.4	14	17	2.1E-03	1.077	2.2E-03
5-1-08	3	120	59.5	48.8	10.7	15	17	1.9E-03	1.077	2.1E-03

**HYDRAULIC CONDUCTIVITY                      2.1E-03                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

### EAST CAROLINA

PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-14</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 123.9	DW= 113.1	9.5
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1299.3		
Unused Wet Weight, W <sub>2</sub> (grams)	135		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1164.3		
Wet Density (pcf)	109.8		
Dry Density (pcf)	100.2		
Void Ratio, e	ASSUMED SG= 2.70		0.68

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-23-08	1	60	54.6	44.4	10.2	21	17	5.7E-03	1.077	6.2E-03
4-23-08	2	60	40.0	16.5	23.5	45	17	5.3E-03	1.077	5.7E-03
4-23-08	3	60	31.3	0.3	31.0	58	17	5.2E-03	1.077	5.6E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>5.8E-03</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

**EAST CAROLINA**  
 PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-15</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 185.1	DW= 167.1	10.8
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.594		1.510
Height, H <sub>1</sub> -H <sub>2</sub>	5.532		14.050
Wet Weight, W <sub>1</sub> (grams)	1935.5		
Unused Wet Weight, W <sub>2</sub> (grams)	814.3		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1121.2		
Wet Density (pcf)	108.8		
Dry Density (pcf)	98.2		
Void Ratio, e	ASSUMED SG= 2.70		0.72

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-30-08	1	60	56.4	35.7	20.7	30	17	4.0E-03	1.077	4.3E-03
4-30-08	2	60	50.7	20.4	30.3	45	17	4.1E-03	1.077	4.4E-03
4-30-08	3	60	48.4	13.9	34.5	49	17	3.9E-03	1.077	4.2E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>4.3E-03</b>	<b>cm/sec</b>
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**SUMMARY OF TEST RESULTS**  
**WASHED SAND PROTECTIVE COVER**

**SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS  
WASHED SAND PROTECTIVE COVER**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 [667,000 sq ft ( 15.3 Acres)]: 6,100 cy washed sand protective cover

SAMPLE NO.	MATERIAL DESCRIPTION	HYDRAULIC CONDUCTIVITY (ASTM D 2434)  (Dense)  cm/s	PERCENT FINES (<#200 seive)  %
PCSP-1-C12	Washed Sand	3.3 E-02	0.8
PCSP-2-C12	Washed Sand	2.5 E-02	2.8
PCSP-3-C12	Washed Sand	4.1 E-02	0.7
PCSP-4-C12	Washed Sand	5.1 E-02	0.8
PCSP-5-C12	Washed Sand	2.9E-02	1.0
PCSP-6-C12	Washed Sand	5.6E-02	0.5
PCSP-7-C12	Washed Sand	2.5E-02	1.0
PCSP-8-C12	Washed Sand	3.3E-02	0.9
PCSP-9-C12	Washed Sand	3.6E-02	—

PROJECT REQUIREMENTS:	k ≥ 1 E-02 cm/s	≤ 5%
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 11-19-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-1</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 113.8	DW= 103.5	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)	1300		
Unused Wet Weight, W <sub>2</sub> (grams)	182.2		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1117.8		
Wet Density (pcf)	106.6		
Dry Density (pcf)	97.0		
Void Ratio, e	ASSUMED SG= 2.70		0.74

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
11-21-07	1	40	59.0	48.2	10.8	81	17	3.1E-02	1.077	3.4E-02
11-21-07	2	24	50.8	30.0	20.8	94	17	3.1E-02	1.077	3.4E-02
11-21-07	3	15	45.4	17.6	27.8	76	17	3.0E-02	1.077	3.3E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>3.3E-02</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 11-21-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-2</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 118.4	DW= 107.6	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)		1250.7	
Unused Wet Weight, W <sub>2</sub> (grams)		70.4	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1180.3	
Wet Density (pcf)		112.6	
Dry Density (pcf)		102.3	
Void Ratio, e	ASSUMED SG= 2.70	0.65	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
11-30-07	1	50	59.4	52.4	7.0	48	16	2.3E-02	1.106	2.5E-02
11-30-07	2	40	50.6	35.4	15.2	81	16	2.2E-02	1.106	2.5E-02
11-30-07	3	35	44.2	23.2	21.0	97	16	2.2E-02	1.106	2.4E-02

**HYDRAULIC CONDUCTIVITY                      2.5E-02                      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 11-21-07

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-3</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMODELED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.3	DW= 100.3	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)	1329		
Unused Wet Weight, W <sub>2</sub> (grams)	200.7		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1128.3		
Wet Density (pcf)	107.6		
Dry Density (pcf)	97.9		
Void Ratio, e	ASSUMED SG= 2.70		0.72

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
11-30-07	1	45	58.3	50.0	8.3	84	16	3.7E-02	1.106	4.1E-02
11-30-07	2	20	48.2	30.1	18.1	81	16	3.7E-02	1.106	4.1E-02
11-30-07	3	15	41.6	17.4	24.2	80	16	3.7E-02	1.106	4.1E-02

**HYDRAULIC CONDUCTIVITY                      4.1E-02                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-4</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.5	DW= 100.7	9.7
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1270.8		
Unused Wet Weight, W <sub>2</sub> (grams)	75.5		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1195.3		
Wet Density (pcf)	112.7		
Dry Density (pcf)	102.7		
Void Ratio, e	ASSUMED SG= 2.70		0.64

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-2-08	1	30	58.7	50.8	7.9	63	14	4.4E-02	1.165	5.2E-02
2-2-08	2	20	49.1	31.0	18.1	95	14	4.4E-02	1.165	5.1E-02
2-2-08	3	12	36.7	9.4	27.3	86	14	4.4E-02	1.165	5.1E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>5.1E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-5</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 190.0	DW= 172.3	10.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)	1350		
Unused Wet Weight, W <sub>2</sub> (grams)	175.6		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1174.4		
Wet Density (pcf)	112.0		
Dry Density (pcf)	101.6		
Void Ratio, e	ASSUMED SG= 2.70		0.66

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
1-27-08	1	60	60.5	53.7	6.8	64	14	2.6E-02	1.165	3.0E-02
1-27-08	2	30	51.2	33.2	18.0	80	14	2.5E-02	1.165	2.9E-02
1-27-08	3	20	45.3	19.9	25.4	75	14	2.5E-02	1.165	2.9E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>2.9E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-6</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 200.0	DW= 179.7	11.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.563		1.430
Height, H <sub>1</sub> -H <sub>2</sub>	5.563		14.130
Wet Weight, W <sub>1</sub> (grams)	1350		
Unused Wet Weight, W <sub>2</sub> (grams)	183.8		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1166.2		
Wet Density (pcf)	112.5		
Dry Density (pcf)	101.1		
Void Ratio, e	0.67		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
1-27-08	1	30	54.1	45.0	9.1	79	14	4.8E-02	1.165	5.6E-02
1-27-08	2	20	42.9	25.8	17.1	98	14	4.8E-02	1.165	5.6E-02
1-27-08	3	15	36.5	14.5	22.0	95	14	4.8E-02	1.165	5.6E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>5.6E-02</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT HEAD METHOD (ASTM D 2434)**

**EAST CAROLINA**

PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 2-15-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-7</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.7	DW= 101.6	9.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)		1200	
Unused Wet Weight, W <sub>2</sub> (grams)		23.5	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1176.5	
Wet Density (pcf)		111.0	
Dry Density (pcf)		101.8	
Void Ratio, e	ASSUMED SG= 2.70	0.65	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**RIGID WALL PERMEAMETER**

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-19-08	1	60	61.8	54.2	7.6	60	14	2.2E-02	1.165	2.6E-02
2-19-08	2	35	54.8	36.4	18.4	84	14	2.2E-02	1.165	2.5E-02
2-19-08	3	25	49.8	23.9	25.9	82	14	2.1E-02	1.165	2.5E-02

**HYDRAULIC CONDUCTIVITY      2.5E-02      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 2-15-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-8</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches	centimeters
	Sample Length Between Manometer Outlets	3.000
Sample Diameter	3.006	7.635
Moisture Content (%)	WW= 118.1      DW= 108.3	9.0
Height, H <sub>1</sub>	6.126	15.560
Height, H <sub>2</sub>	0.437	1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689	14.450
Wet Weight, W <sub>1</sub> (grams)	1250	
Unused Wet Weight, W <sub>2</sub> (grams)	89.2	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1160.8	
Wet Density (pcf)	109.5	
Dry Density (pcf)	100.4	
Void Ratio, e	0.68	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-19-08	1	60	61.5	54.7	6.8	71	14	2.9E-02	1.165	3.4E-02
2-19-08	2	30	52.2	33.7	18.5	94	14	2.8E-02	1.165	3.3E-02
2-19-08	3	20	46.8	21.3	25.5	86	14	2.8E-02	1.165	3.3E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>3.3E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-9</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 150.0	DW= 137.6	9.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1200.8		
Unused Wet Weight, W <sub>2</sub> (grams)	45		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1155.8		
Wet Density (pcf)	109.0		
Dry Density (pcf)	100.0		
Void Ratio, e	0.68		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
3-27-08	1	60	60.8	54.4	6.4	76	16	3.3E-02	1.106	3.6E-02
3-27-08	2	25	49.3	30.6	18.7	91	16	3.2E-02	1.106	3.6E-02
3-27-08	3	15	42.5	16.6	25.9	73	16	3.1E-02	1.106	3.5E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>3.6E-02</b>	<b>cm/sec</b>
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# **APPENDIX D**

## **LABORATORY TEST RESULTS**

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- **HYDRAULIC CONDUCTIVITY TEST REPORTS – UNDISTURBED SAMPLES**

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**SUMMARY OF TEST RESULTS – WASHED SAND PROTECTIVE COVER**

- **PARTICLE SIZE DISTRIBUTION REPORTS**
- **HYDRAULIC CONDUCTIVITY TEST REPORTS – REMOLDED SAMPLES**

**SUMMARY OF TRIPP PROPERTY BORROW AREA TEST RESULTS (PERFORMED IN 2005)**

**SUMMARY OF PROCTORS - STRUCTURAL FILL  
CONSTRUCTION OF CELL NO. 12**

**CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58**

SAMPLE DESIGNATION	STANDARD PROCTOR PARAMETERS (ASTM D 698)	
	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
SF-1-C11	114.5	14.5
SF-2-C11	108.7	17.3
SF-4-C11	111.5	11.1
P-4-4	104.9	19.5
TP-5-C9	99.2	21.5
CLSP-2-C12	105.7	18.0

**SUMMARY OF PROCTORS - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

**CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58**

<b>SAMPLE DESIGNATION</b>	<b>STANDARD PROCTOR PARAMETERS (ASTM D 698)</b>	
	<b>MAXIMUM DRY DENSITY (PCF)</b>	<b>OPTIMUM MOISTURE CONTENT (%)</b>
<b>TP-5</b>	<b>100.1</b>	<b>19.9</b>
<b>CLSP-2-C12</b>	<b>105.7</b>	<b>18.0</b>
<b>CLSP-3-C12</b>	<b>102.6</b>	<b>20.4</b>

**SUMMARY OF CQA CONFORMANCE TESTING - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-59

Cell No. 12 = 651,000 sq ft (15 Acres) = 48,177 cy Clay Liner

TEST METHOD	REQUIRED FREQUENCY	REQUIRED NUMBER OF TESTS	NUMBER OF TESTS PERFORMED*
<b>FIELD TEST</b>			
DENSITY	ASTM D 2922 or D 2937	1/10,000sf/lift	272
MATERIAL GRAIN SIZE	< 3-INCH SIEVE FOR LOWER 18 INCHES (100% avg) < 1-INCH SIEVE FOR UPPER 6 INCHES (95% avg all tests & 100% avg 3-INCH SIEVE)	1/20,000sf/lift	136
<b>LABORATORY TEST</b>			
CLAY LINER STOCKPILE SAMPLES (BEFORE PLACEMENT)			
MOISTURE-DENSITY (PROCTOR)	ASTM D 698	1 / 10,000 cy	5
REMOLED PERMEABILITY	ASTM D 5084	1 / 10,000 cy	5
GRAIN SIZE	ASTM D 422	1	1
MOISTURE CONTENT	ASTM D 2216	1	1
ATTERBERG LIMITS	ASTM D 4318	1	1
UNDISTURBED SAMPLES (DURING PLACEMENT):			
PERMEABILITY	ASTM D 5084	1 / acre / lift	64
DRY DENSITY	ASTM D 2922	1 / acre / lift	64
MOISTURE CONTENT	ASTM D 2216	1 / acre / lift	64
BULK SAMPLES (DURING PLACEMENT):			
MOISTURE-DENSITY (PROCTOR)	ASTM D 698	2/lift	8
GRAIN SIZE	ASTM D 422	2/lift	8
MOISTURE CONTENT	ASTM D 2216	2/lift	8
ATTERBERG LIMITS	ASTM D 4318	2/lift	8

**SUMMARY OF STOCKPILE & BULK SAMPLE TEST DATA  
COMPACTED CLAY LINER**

**SUMMARY OF CQA BORROW AND BULK SAMPLE CONFORMANCE TESTING - COMPACTED CLAY LINER  
CONSTRUCTION OF CELL NO. 12**

CONSTRUCTION QUALITY ASSURANCE  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-38

Cell No. 12 = 651,000 sq ft (15 Acres) = 48,177 cy Clay Liner

	MATERIAL DESCRIPTION	PERCENT FINES (<#200 sieve) %	ATTERBERG LIMITS			PROCTOR PARAMETERS			REMOLD PARAMETERS			REMOLDED HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s
			LIQUID LIMIT %	PLASTICITY INDEX %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	DRY DENSITY (% COMP.) %	MOISTURE CONTENT (% WET OF OPT.) %	DRY DENSITY (% COMP.) %	MOISTURE CONTENT (% WET OF OPT.) %		
CLSP-1-C12	Light Brown & Grey fi Sandy CLAY	89.8	40.0	21.0	106.3	17.9	101.0 (95)	24.1 (6.2)	101.0 (95)	24.1 (6.2)	2.2E-08	
CLSP-2-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	105.7	18.0	101.0 (96)	23.0 (5.0)	101.0 (96)	23.0 (5.0)	2.7E-08	
CLSP-3-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	102.6	20.4	97.4 (95)	26.1 (5.7)	97.4 (95)	26.1 (5.7)	3.6E-08	
CLSP-4-C12	Light Brown & Grey fi Sandy CLAY	---	---	---	103.8	19.0	99.1 (96)	25.0 (6.0)	101.0 (96)	24.0 (6.9)	5.0E-08	
CLSP-5-C12	Grey & brown fi.-med. Sandy CLAY	---	---	---	105.6	17.1	101.0 (96)	24.0 (6.9)	101.0 (96)	24.0 (6.9)	4.3E-08	
LTP-1-1	Light Brown & Grey fi Sandy CLAY	80.8	43	23	110.9	16.2	106 (96)	20 (3.8)	106 (96)	20 (3.8)	1.9E-08	
L-1-2	Light Brown & Grey fi Sandy CLAY	87.0	42	24	103.6	18.8	---	---	---	---	---	
LTP-2-1	Light Brown & Grey fi Sandy CLAY	71.4	41	25	108.0	18.0	103.1 (96)	22.0 (4.0)	103.1 (96)	22.0 (4.0)	1.6E-08	
L-2-2	Light Brown & Grey fi Sandy CLAY	73.4	43	26	106.2	17.1	---	---	---	---	---	
LTP-3-1	Light Brown & Grey fi Sandy CLAY	75.9	44	26	104.4	14.3	100.0 (96)	22.0 (7.7)	100.0 (96)	22.0 (7.7)	4.1E-08	
L-3-2	Light Brown & Grey fi Sandy CLAY	82.8	45	27	104.6	18.5	---	---	---	---	---	
LTP-4-1	Light Brown & Grey fi Sandy CLAY	77.3	42	24	106.8	16.5	102.1 (96)	23 (6.5)	102.1 (96)	23 (6.5)	4.6E-08	
L-4-2	Light Brown & Grey fi Sandy CLAY	87.3	45	27	108.0	14.9	---	---	---	---	---	

**PARTICLE SIZE DISTRIBUTION REPORTS**

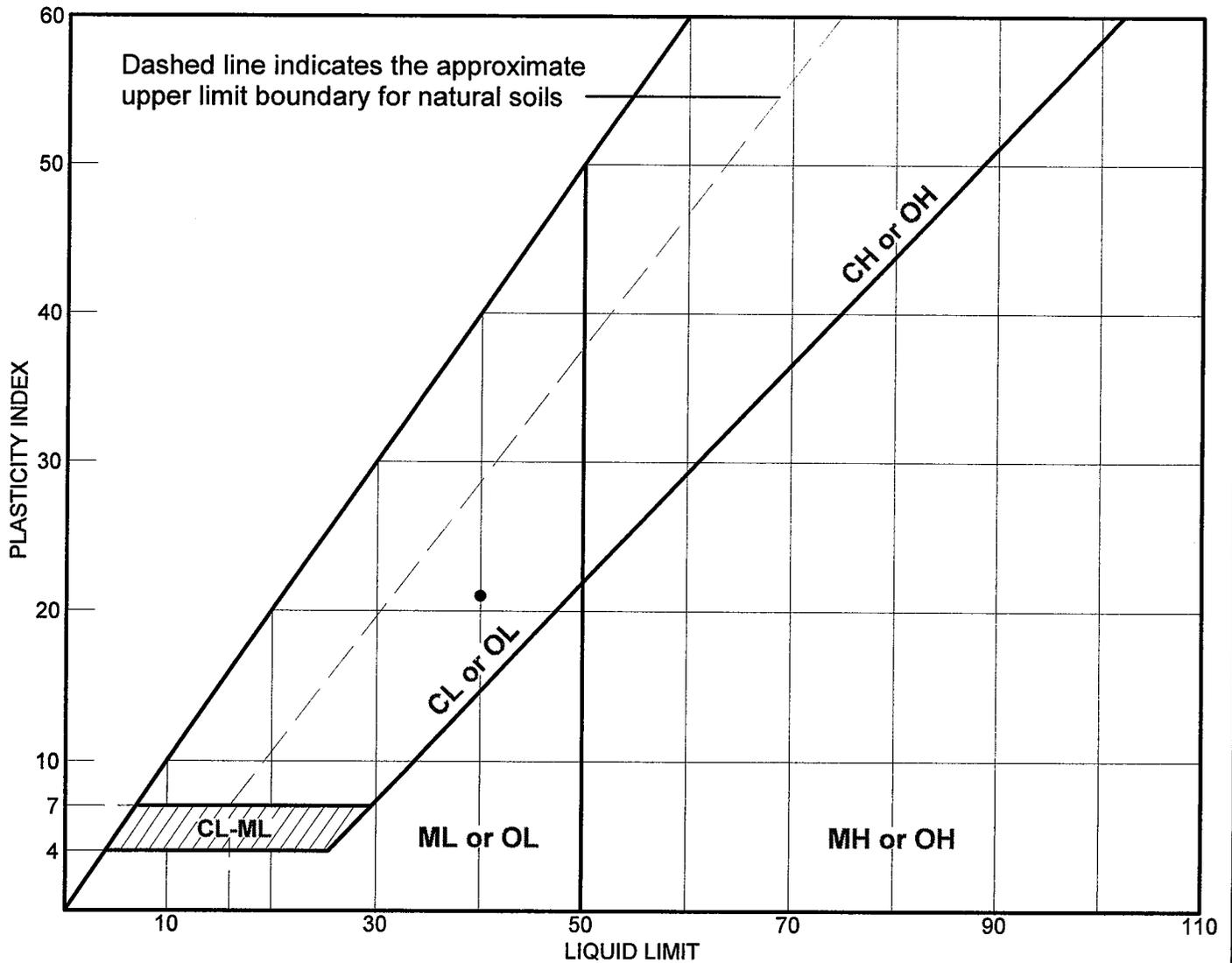






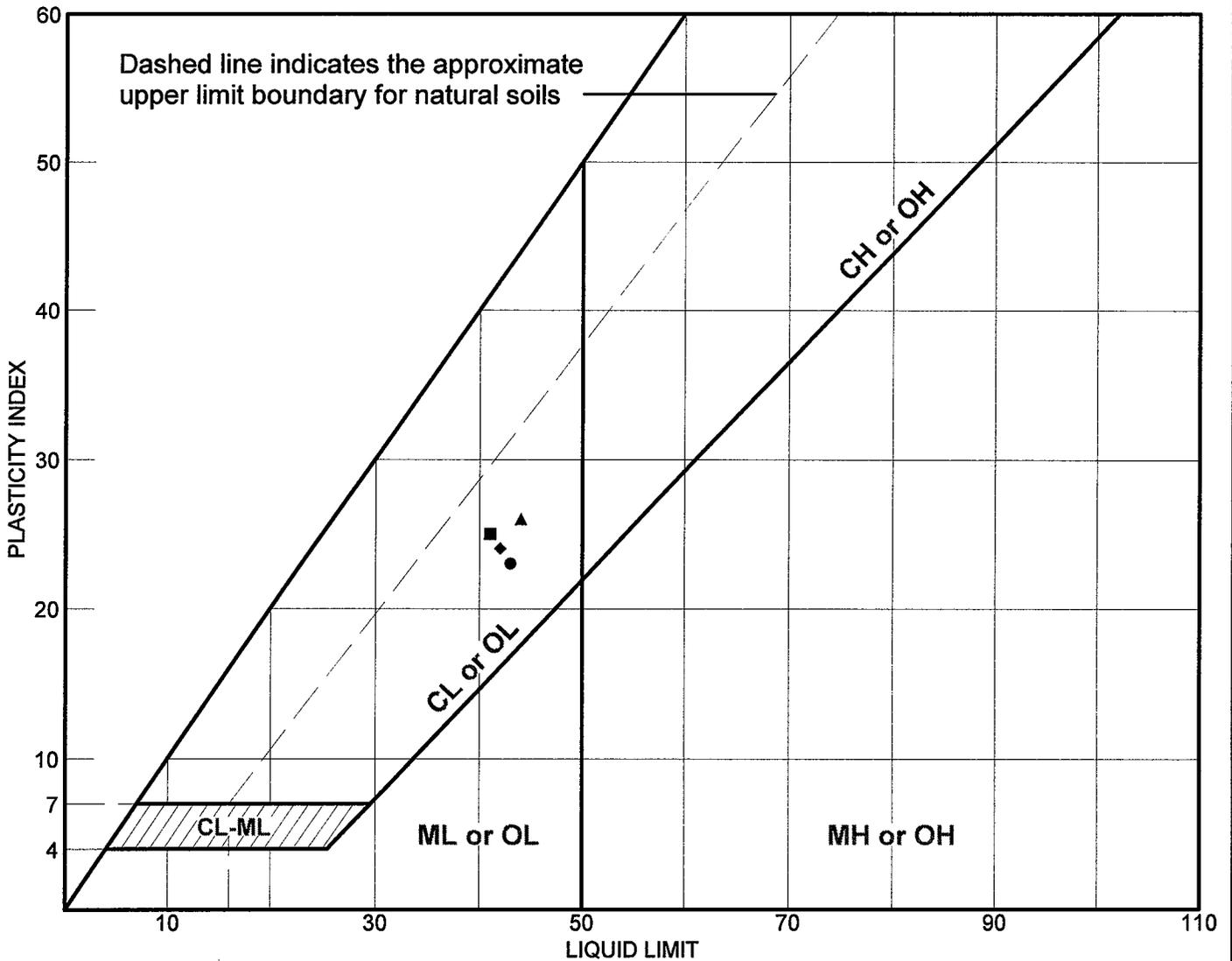
**ATTERBERG LIMITS TEST REPORTS**

# LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	Stockpile	CLSP-1-C12		21.6	19	40	21	

# LIQUID AND PLASTIC LIMITS TEST REPORT



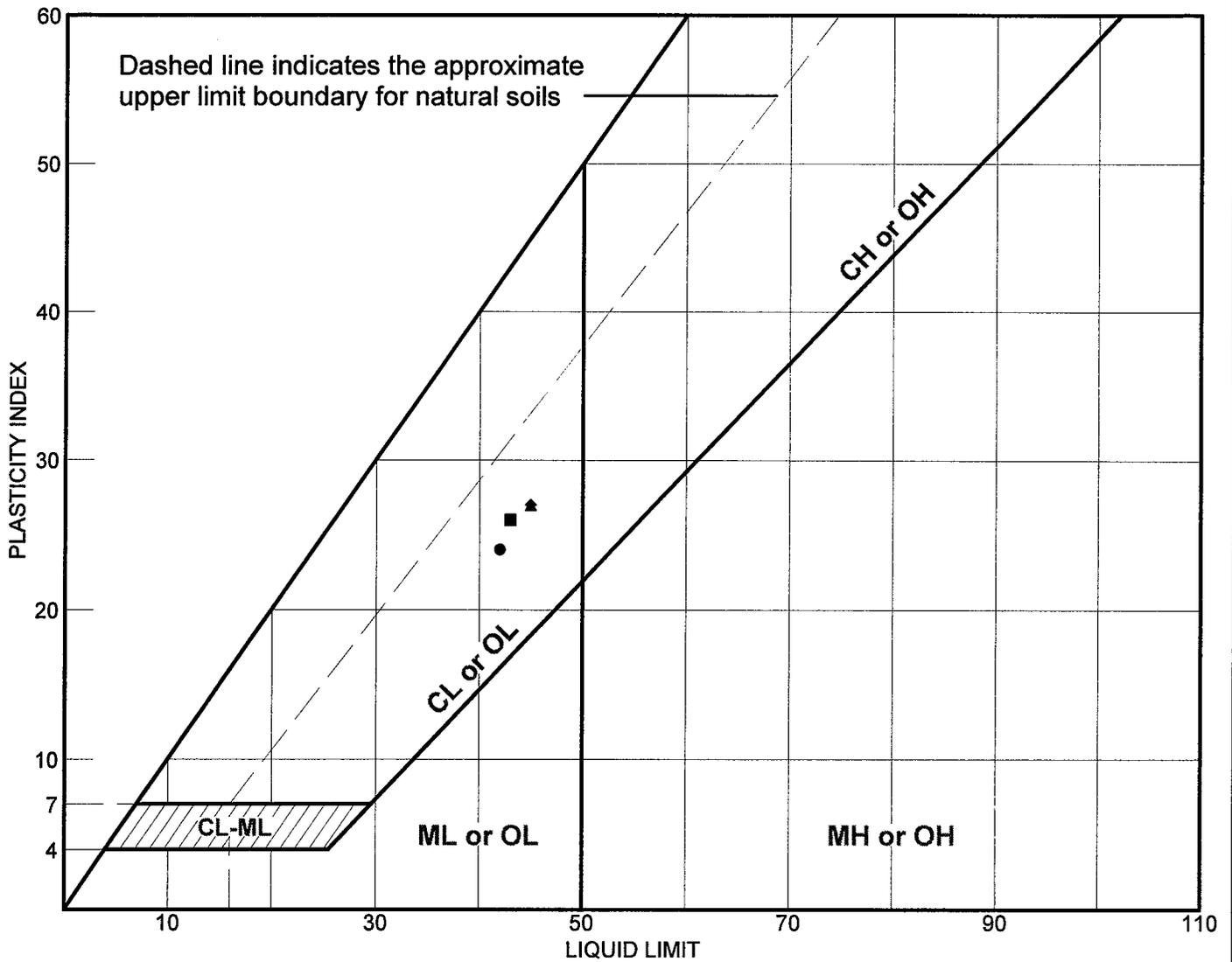
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Test Pad	LTP-1-1		19.4	20	43	23	CL
■	Test Pad	LTP-2-1		22.4	16	41	25	CL
▲	Test Pad	LTP-3-1		20.8	18	44	26	CL
◆	Test Pad	LTP-4-1		23.3	18	42	24	CL

LIQUID AND PLASTIC LIMITS TEST REPORT  
**Bunnell Lammons Engineering, Inc.**  
 Greenville, SC

**Client:** HHNT  
**Project:** East Carolina Landfill  
 Cell 12  
**Project No.:** J07-1001-58

**Plate**

# LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Liner	L-1-2		24.3	18	42	24	CL
■	Liner	L-2-2		23.5	17	43	26	CL
▲	Liner	L-3-2		22.6	18	45	27	CL
◆	Liner	L-4-2		24.8	18	45	27	CL

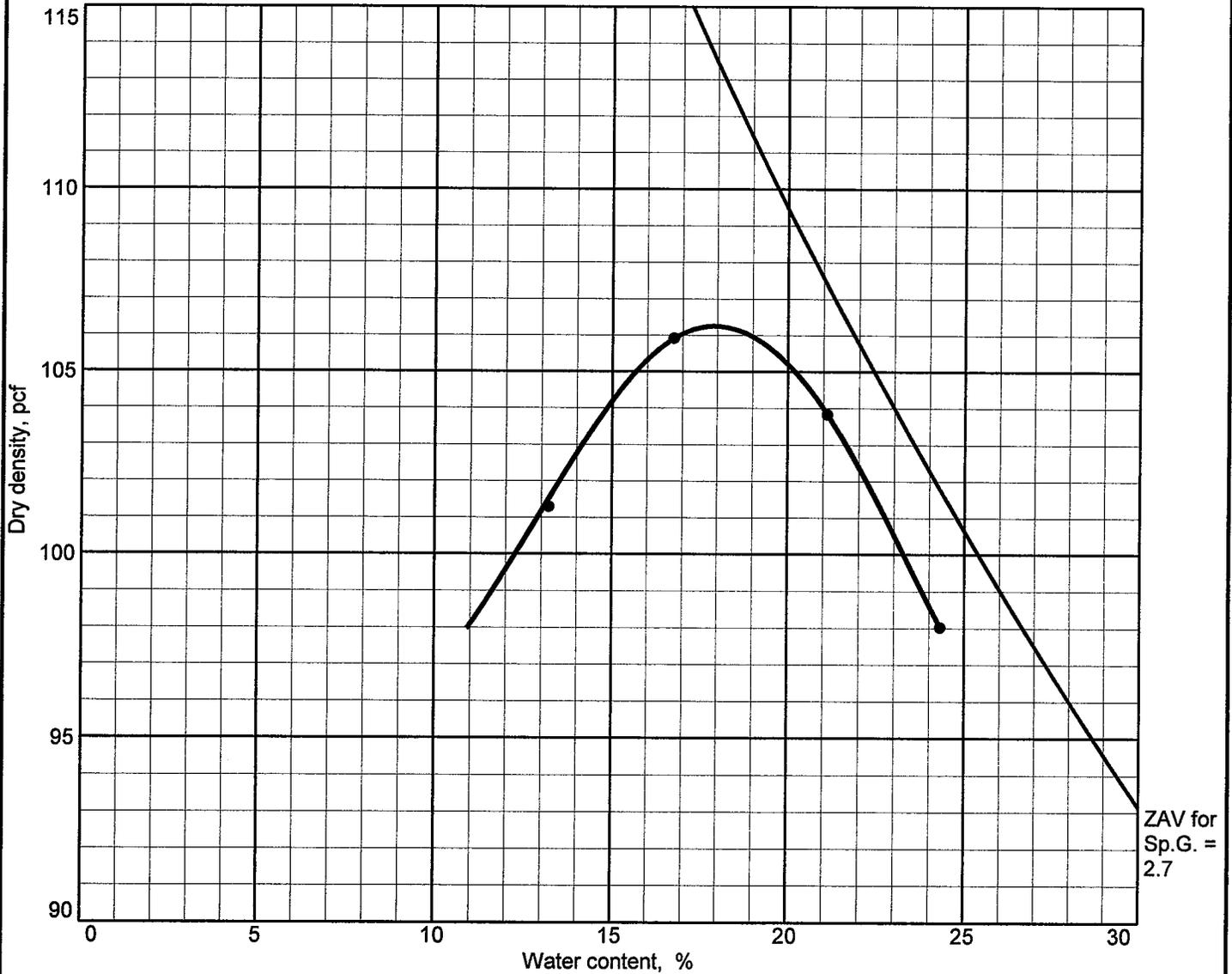
LIQUID AND PLASTIC LIMITS TEST REPORT  
**Bunnell Lammons Engineering, Inc.**  
 Greenville, SC

Client: HHNT  
 Project: East Carolina Landfill  
 Cell 12  
 Project No.: J07-1001-58

Plate

**STANDARD PROCTOR TEST REPORTS**

# MOISTURE/DENSITY RELATIONSHIP



ZAV for  
Sp.G. =  
2.7

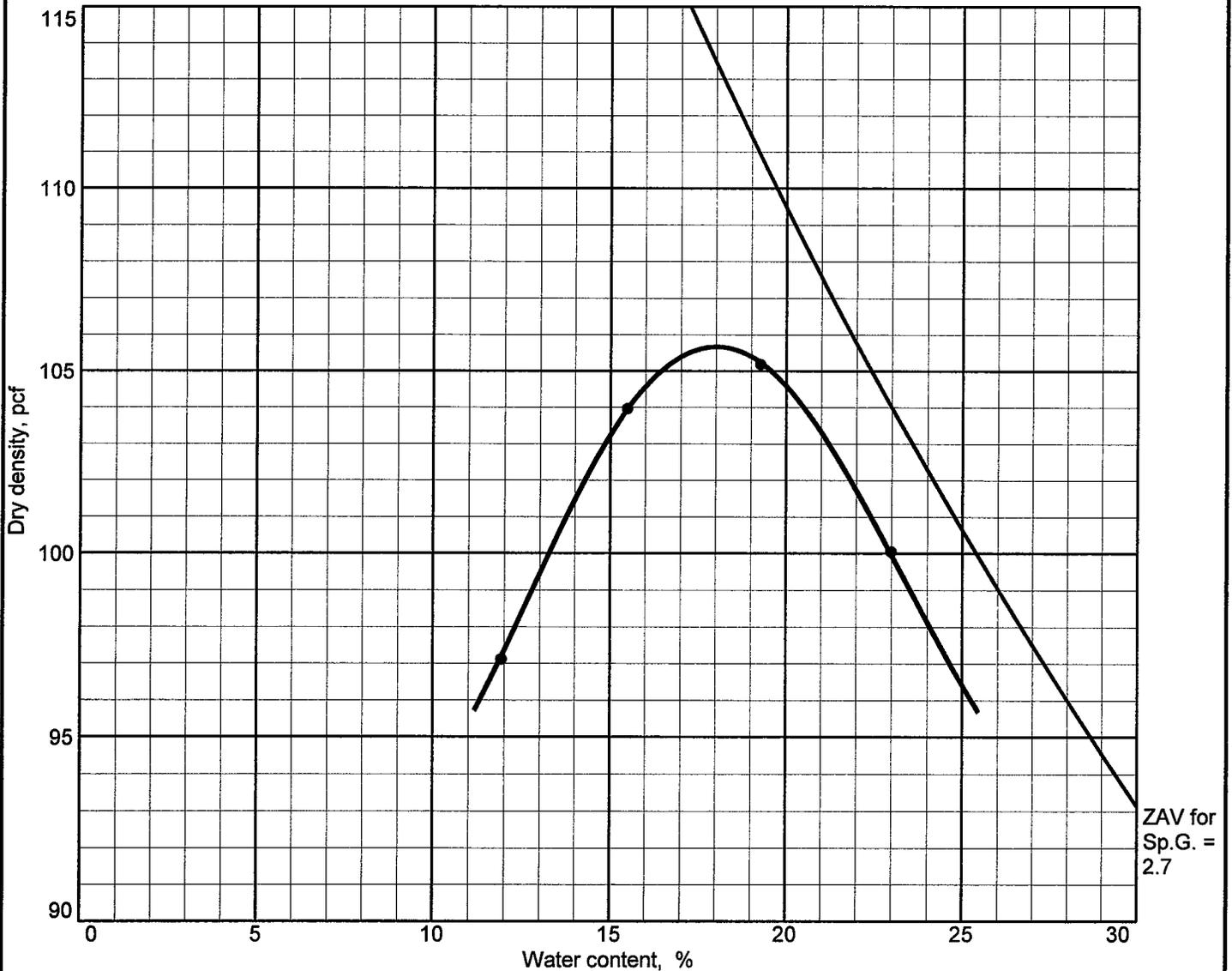
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
			21.6		40	21	0.0	89.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.3 pcf Optimum moisture = 17.9 %	Grey & brown fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-1-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



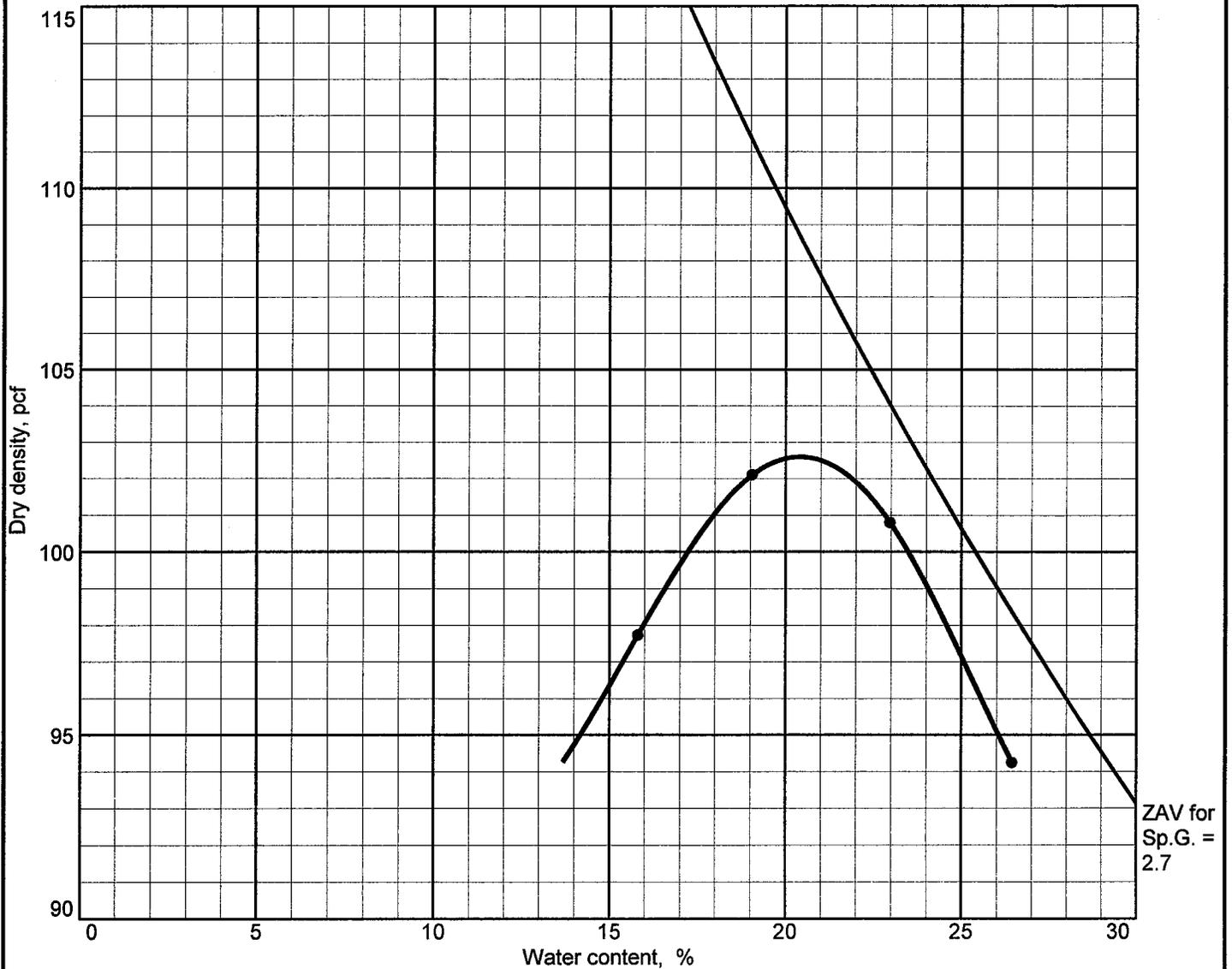
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105.7 pcf Optimum moisture = 18.0 %	Grey & brown fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-2-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP

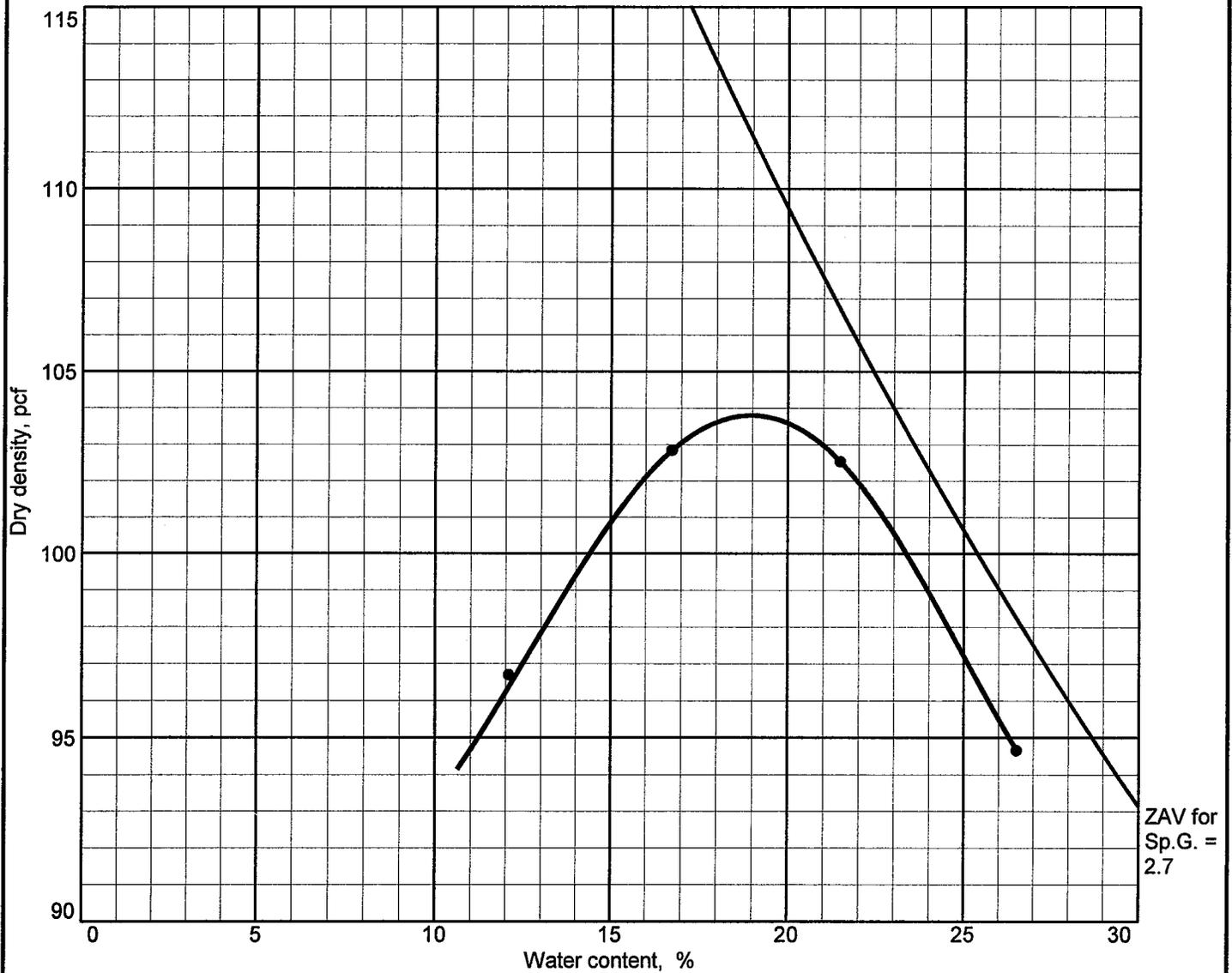


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 102.6 pcf Optimum moisture = 20.4 %	Grey & brown fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-3-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP

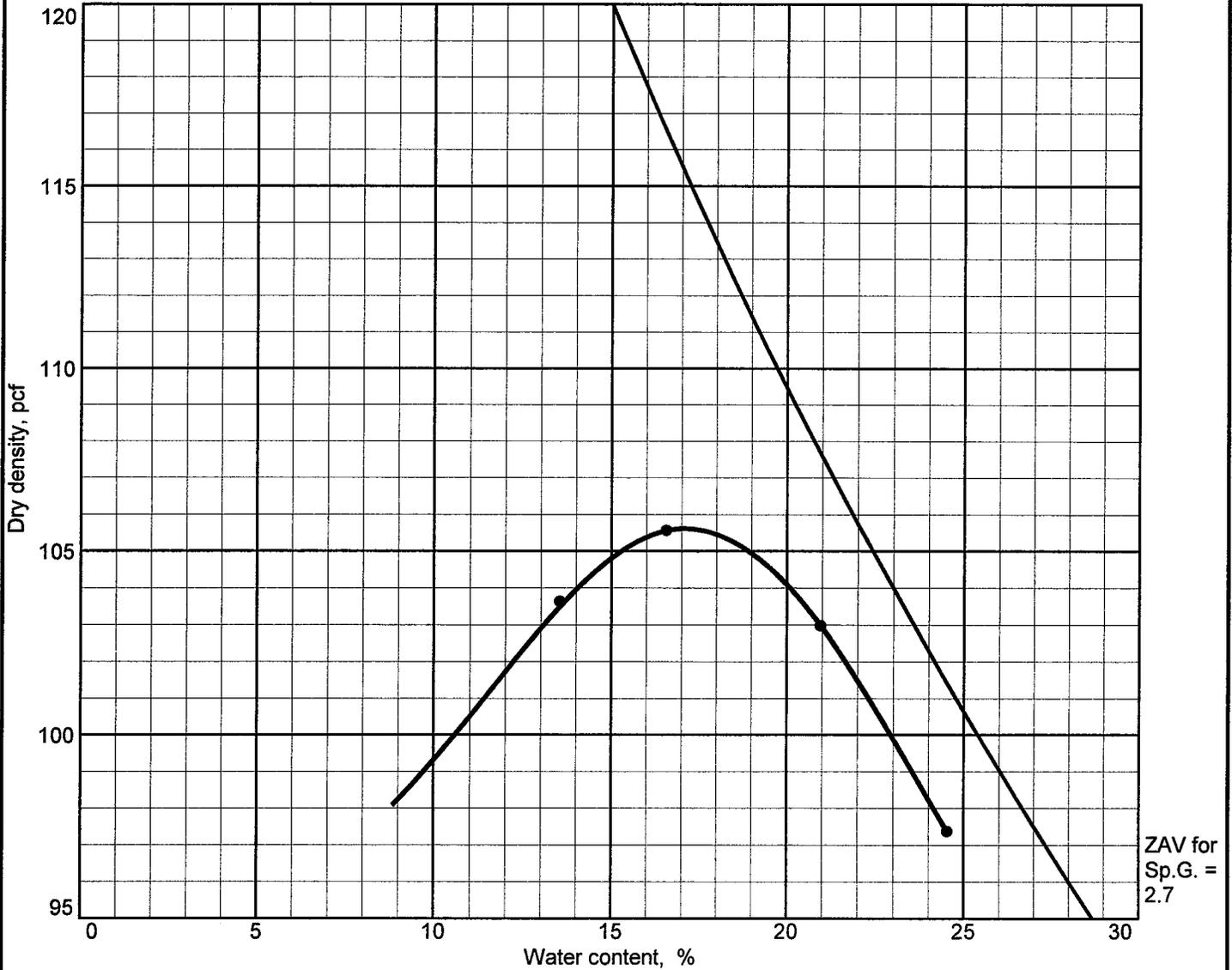


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.8 pcf Optimum moisture = 19.0 %	Light brown fi.-med. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-4-C12</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP

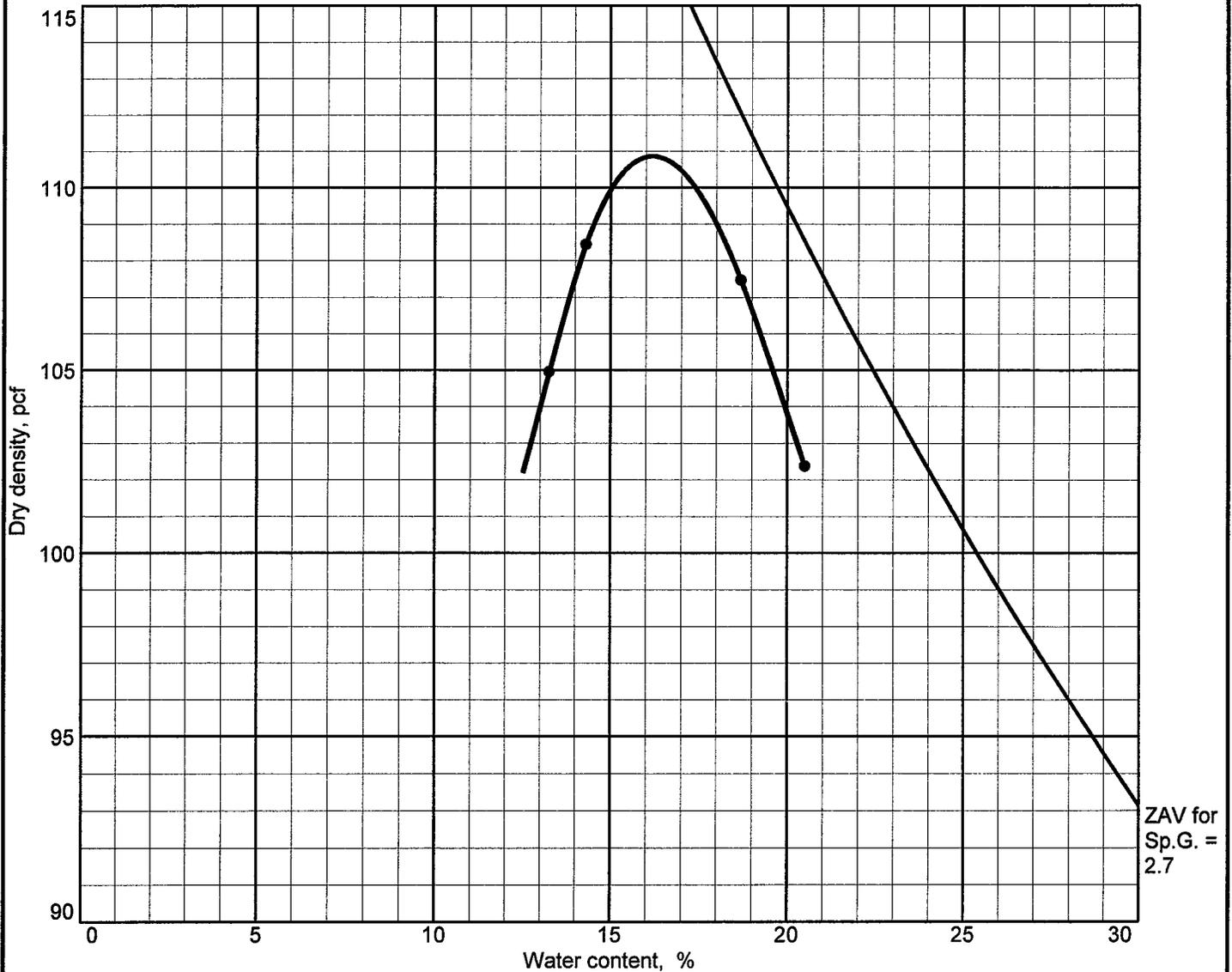


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 105.6 pcf Optimum moisture = 17.1 %	Grey & brown fi.-med. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Stockpile <span style="float: right;"><b>Sample No.:</b> CLSP-5</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP



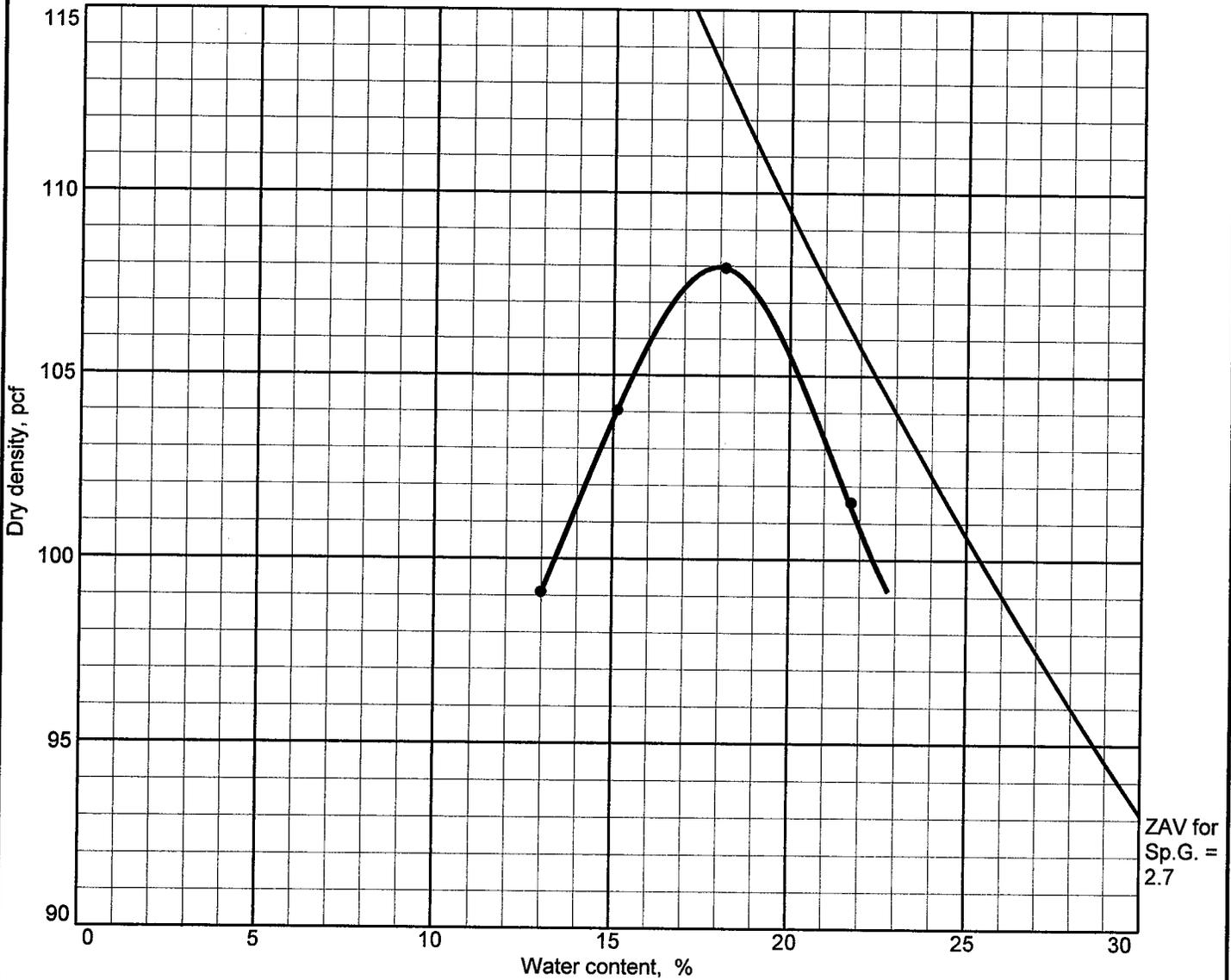
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		19.4		43	23	0.0	80.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 110.9 pcf Optimum moisture = 16.2 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-1-1</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



ZAV for  
Sp.G. =  
2.7

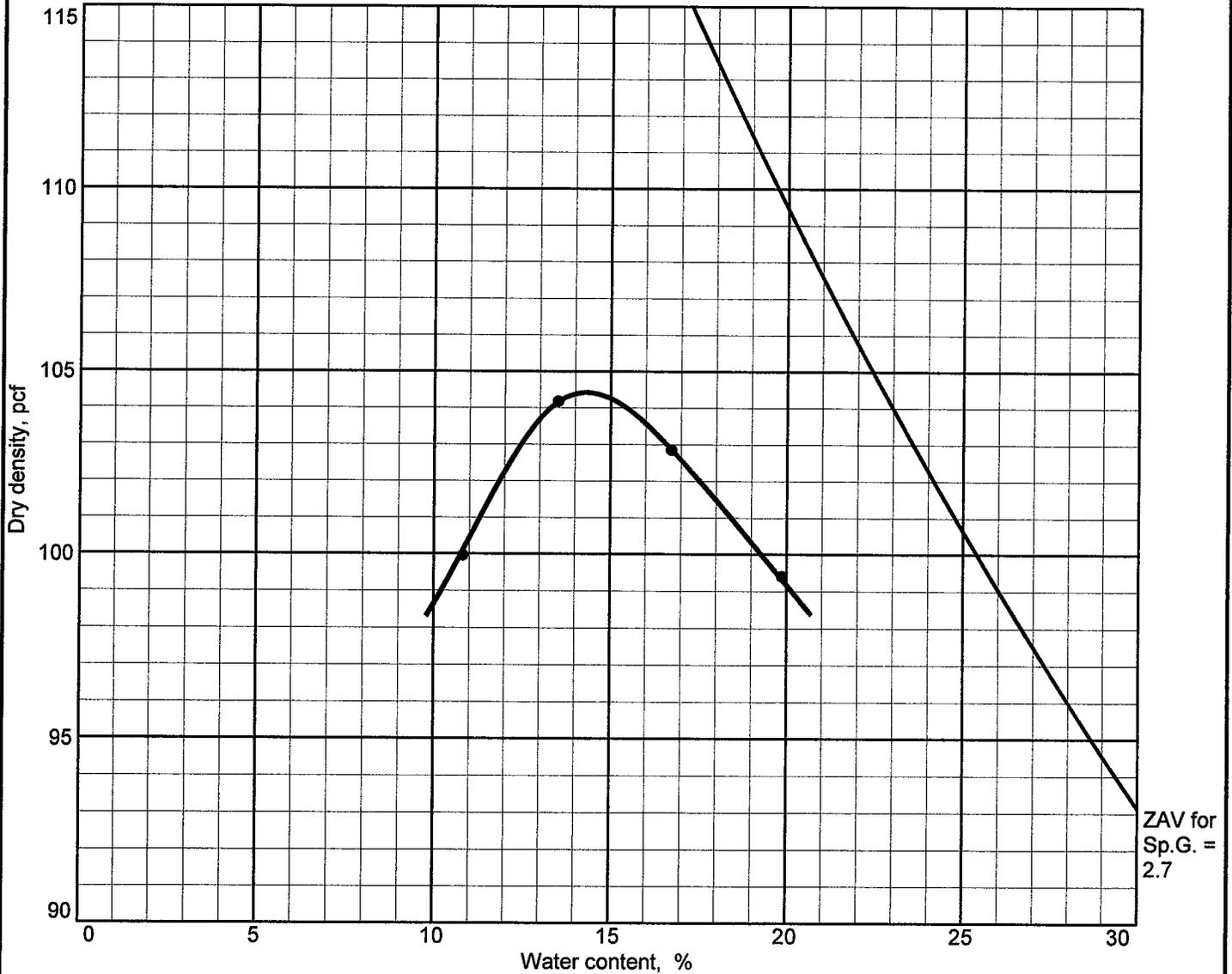
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		22.4		41	25	0.0	71.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.0 pcf Optimum moisture = 18.0 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-2-1</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



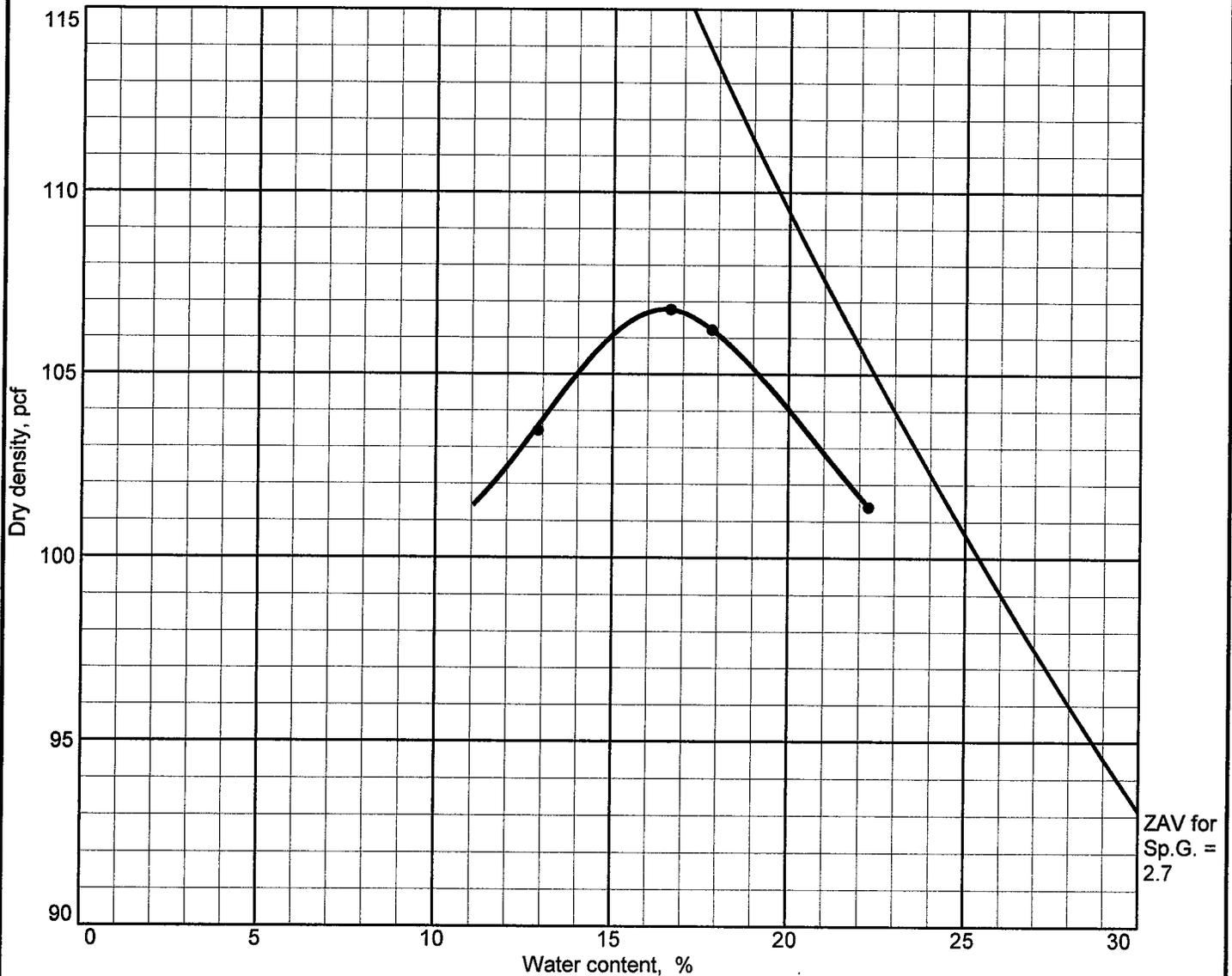
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		20.8		44	26	0.0	75.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.4 pcf Optimum moisture = 14.3 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Test Pad <span style="float: right;"><b>Sample No.:</b> LTP-3-1</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP

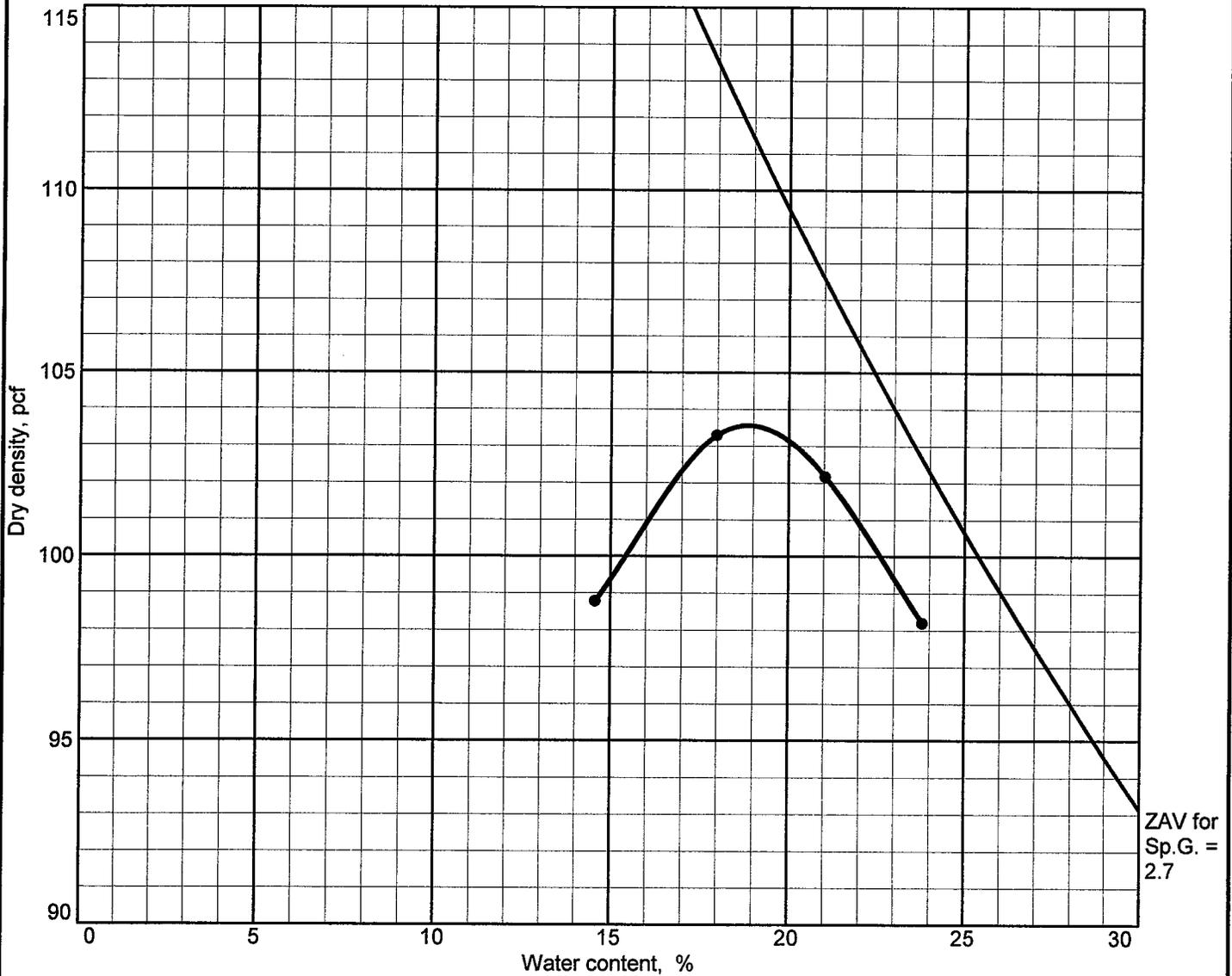


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		23.3		42	24	0.0	77.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.8 pcf Optimum moisture = 16.5 %	Light brown & grey fi. sandy CLAY
Project No. J07-1001-58 Client: HHNT Project: East Carolina Landfill Cell 12 ● Source: Test Pad Sample No.: LTP-4-1	Remarks:
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP



ZAV for Sp.G. = 2.7

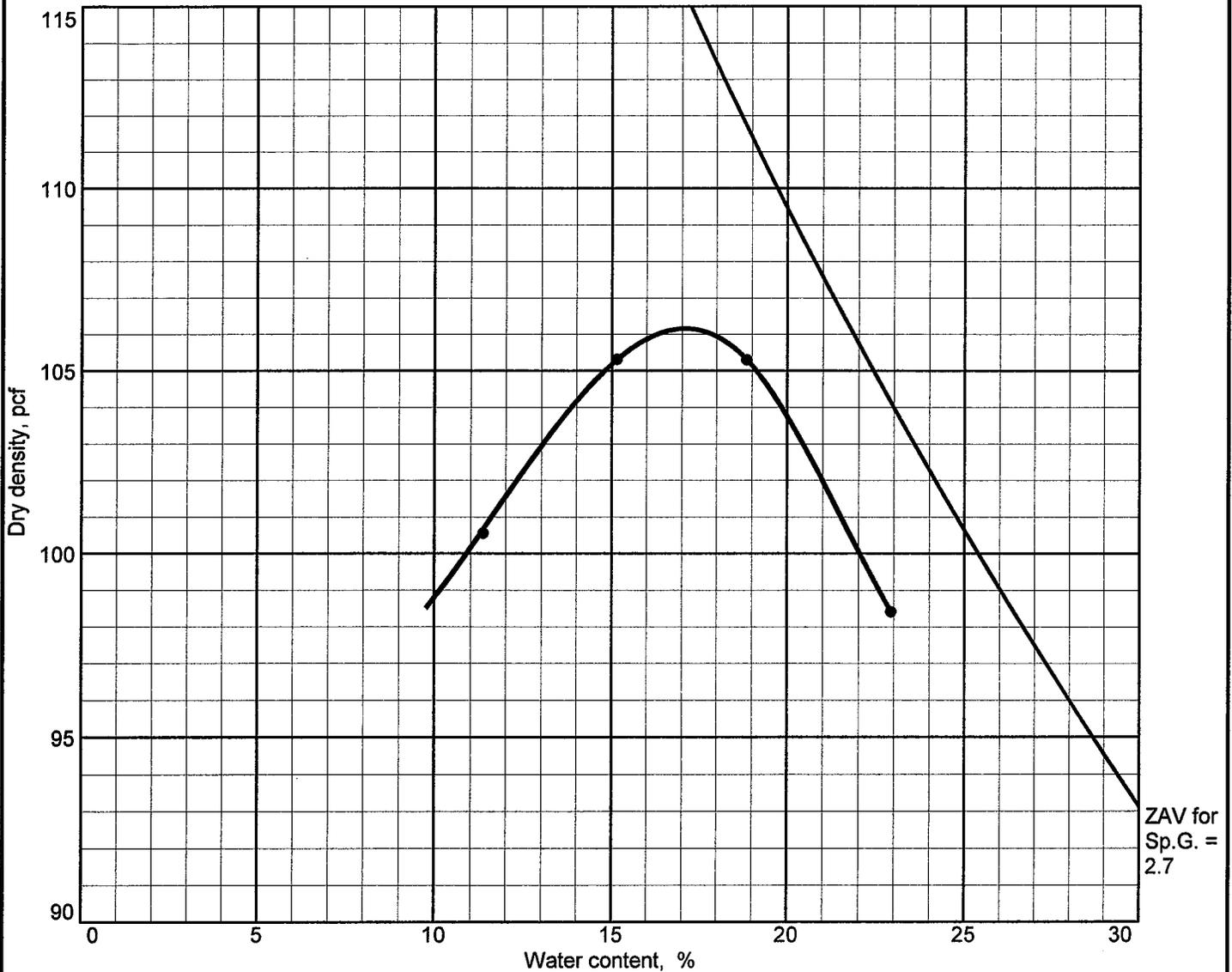
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		24.3		42	24	0.0	87.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.6 pcf Optimum moisture = 18.8 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-1-2</span>	Remarks:
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP

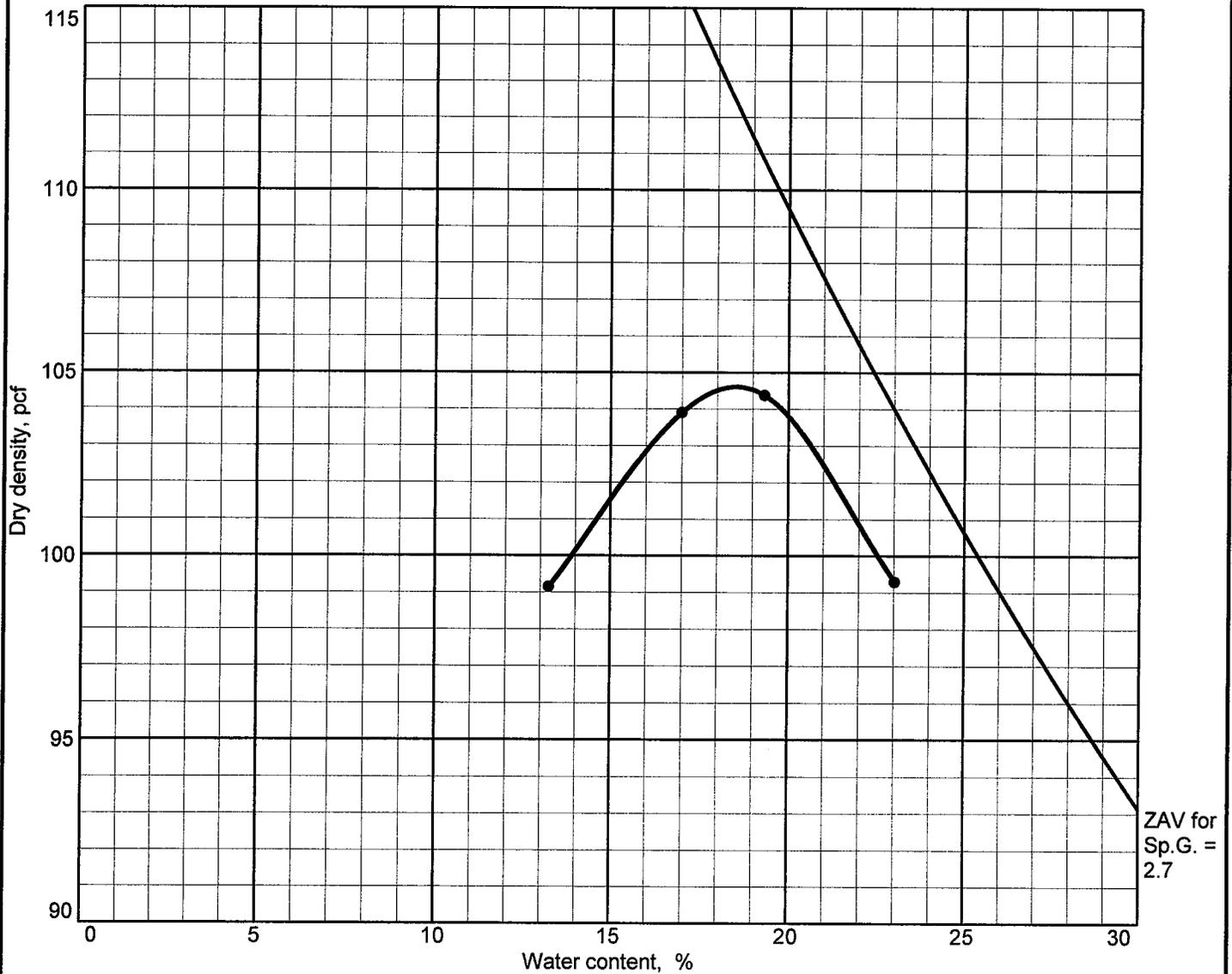


Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		23.5		43	26	0.0	73.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.2 pcf Optimum moisture = 17.1 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-2-2</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

# MOISTURE/DENSITY RELATIONSHIP



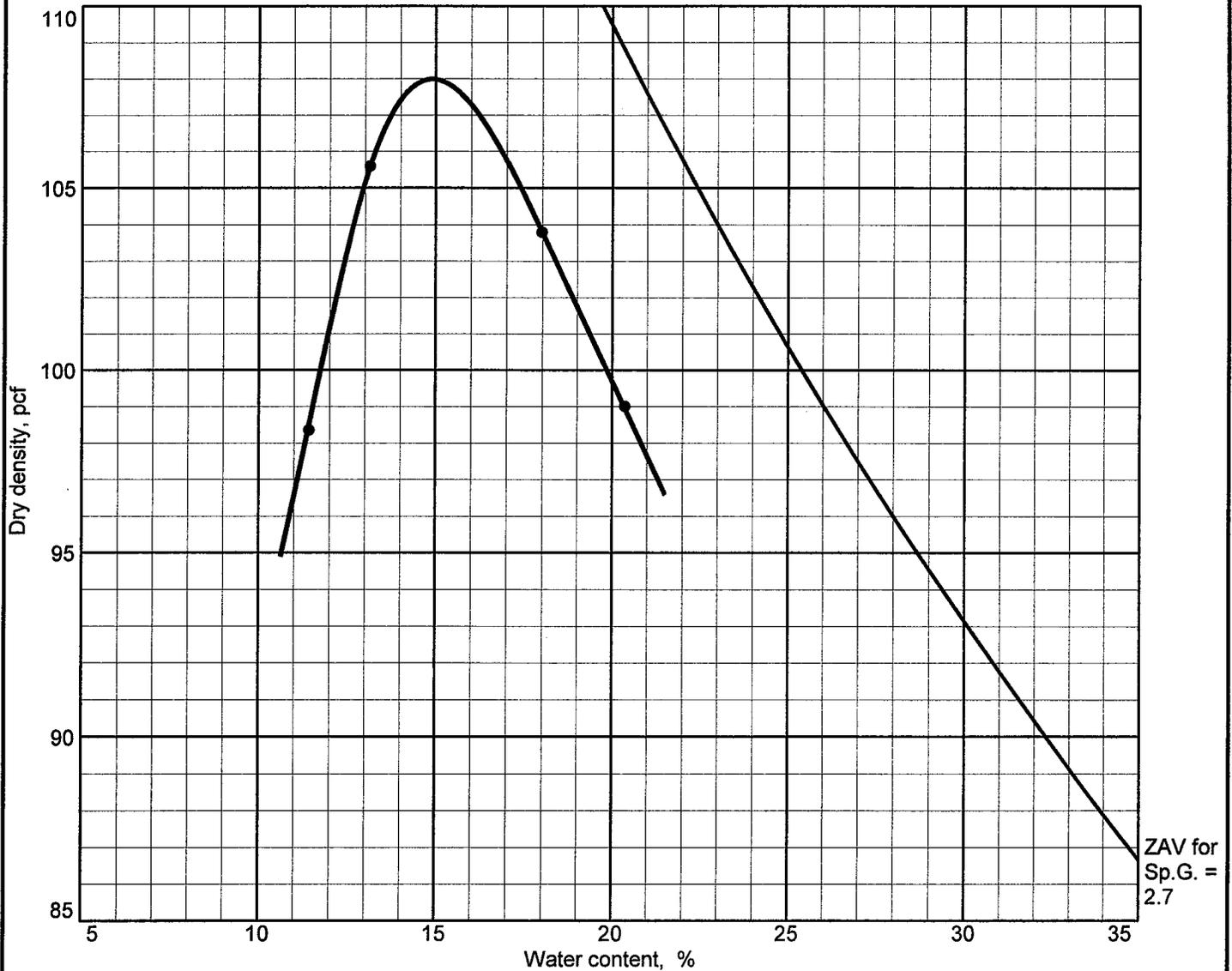
Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		22.6		45	27	0.0	82.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.6 pcf Optimum moisture = 18.5 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-3-2</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

# MOISTURE/DENSITY RELATIONSHIP



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	CL		24.8		45	27	0.0	87.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.0 pcf Optimum moisture = 14.9 %	Light brown & grey fi. sandy CLAY
<b>Project No.</b> J07-1001-58 <b>Client:</b> HHNT <b>Project:</b> East Carolina Landfill Cell 12 ● <b>Source:</b> Liner <span style="float: right;"><b>Sample No.:</b> L-4-2</span>	<b>Remarks:</b>
<b>Bunnell Lammons Engineering, Inc.</b> <b>Greenville, SC</b>	

Plate

**HYDRAULIC CONDUCTIVITY TEST REPORTS**  
**REMOLDED SAMPLES**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 12-31-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>CLSP-1-C12</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.960	7.518
Sample Diameter	2.850	7.239	2.836	7.203
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 114.5    DW= 92.3	24.1	WW= 198.4    DW= 161.4	22.9
Sample Wet Weight (grams)	629.5		627.1	
Wet Density (pcf)	125.3		127.8	
Dry Density (pcf)	101.0		103.9	
Saturation (%)	ASSUMED SG= 2.7	97	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-3-08	1:56:48		7.1	1.69	22	10				
	1-3-08	2:26:14	0:29:26	6.6	1.71	22	9	2.4E-08	0.953	2.2E-08	
	1-3-08	2:32:43	0:35:55	6.5	1.71	22	9	2.3E-08	0.953	2.2E-08	
	1-3-08	2:39:28	0:42:40	6.4	1.72	22	9	2.3E-08	0.953	2.2E-08	
	1-3-08	2:46:53	0:50:05	6.3	1.72	22	9	2.3E-08	0.953	2.2E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.2E-08    cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):    95.0  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):    +6.2

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 12-31-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>CLSP-2-C12</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.971	7.546
Sample Diameter	2.850	7.239	2.837	7.206
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 166.9    DW= 135.7	23.0	WW= 189.9    DW= 154.3	23.1
Sample Wet Weight (grams)	624.1		624.9	
Wet Density (pcf)	124.2		126.8	
Dry Density (pcf)	101.0		103.0	
Saturation (%)	ASSUMED SG= 2.7	93	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-3-08	1:57:15		7.5	2.09	22	10				
	1-3-08	2:15:40	0:18:25	7.1	2.10	22	9	3.0E-08	0.953	2.8E-08	
	1-3-08	2:21:26	0:24:11	7.0	2.11	22	9	2.9E-08	0.953	2.7E-08	
	1-3-08	2:27:36	0:30:21	6.9	2.11	22	9	2.8E-08	0.953	2.6E-08	
	1-3-08	2:34:04	0:36:49	6.8	2.12	22	9	2.7E-08	0.953	2.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.7E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +5.0

BLE INC.

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-3-02

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>CLSP-3-C12</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.974	7.554
Sample Diameter	2.850	7.239	2.836	7.203
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 65.2    DW= 51.7	26.1	WW= 201.0    DW= 160.0	25.6
Sample Wet Weight (grams)	617.4		614.7	
Wet Density (pcf)	122.9		124.6	
Dry Density (pcf)	97.4		99.2	
Saturation (%) <small>ASSUMED SG= 2.7</small>	97		99	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	1-7-08	2:28:49		7.5	2.09	21	10			
	1-7-08	3:13:21	0:44:32	6.4	2.13	21	8	3.7E-08	0.976	3.6E-08
	1-7-08	3:18:10	0:49:21	6.3	2.14	21	8	3.7E-08	0.976	3.6E-08
	1-7-08	3:23:29	0:54:40	6.2	2.14	21	8	3.6E-08	0.976	3.5E-08
	1-7-08	3:28:41	0:59:52	6.1	2.14	21	7	3.6E-08	0.976	3.5E-08

**HYDRAULIC CONDUCTIVITY (k)      3.5E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      94.9  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +5.7

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-21-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>CLSP-4-C12</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>LIGHT BROWN FI.-MED. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.958	7.513
Sample Diameter	2.850	7.239	2.844	7.224
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 134.2    DW= 107.4	25.0	WW= 255.0    DW= 206.8	23.3
Sample Wet Weight (grams)	621.9		622.4	
Wet Density (pcf)	123.8		126.2	
Dry Density (pcf)	99.1		102.3	
Saturation (%) <small>ASSUMED SG= 2.7</small>	96		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)							
75		60		60							
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-27-08	3:40:55		10.2	1.98	22	15				
	2-27-08	4:02:37	0:21:42	9.0	2.03	22	13	5.2E-08	0.953	5.0E-08	
	2-27-08	4:04:35	0:23:40	8.9	2.03	22	13	5.2E-08	0.953	5.0E-08	
	2-27-08	4:06:40	0:25:45	8.8	2.03	22	12	5.2E-08	0.953	5.0E-08	
	2-27-08	4:08:53	0:27:58	8.7	2.04	22	12	5.2E-08	0.953	4.9E-08	

**HYDRAULIC CONDUCTIVITY (k)      5.0E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.5

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.0

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>CLSP-5-C12</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL.-MED. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.987	7.587
Sample Diameter	2.850	7.239	2.842	7.219
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 112.2    DW= 90.5	24.0	WW= 232.5    DW= 187.6	23.9
Sample Wet Weight (grams)	629.2		628.9	
Wet Density (pcf)	125.2		126.4	
Dry Density (pcf)	101.0		102.0	
Saturation (%)	ASSUMED SG= 2.7	97	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	4-25-08	2:22:45		7.5	2.09	21	10				
	4-25-08	2:49:17	0:26:32	6.6	2.12	21	8	4.9E-08	0.976	4.8E-08	
	4-25-08	2:52:34	0:29:49	6.5	2.13	21	8	4.9E-08	0.976	4.8E-08	
	4-25-08	2:55:57	0:33:12	6.4	2.13	21	8	4.9E-08	0.976	4.8E-08	
	4-25-08	2:59:26	0:36:41	6.3	2.14	21	8	4.9E-08	0.976	4.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.8E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6  
 % WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.9

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHIEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LTP-1-1</u>	SAMPLE LOCATION:	<u>TEST PAD LIFT 1</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>LIGHT BROWN &amp; GREY FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.954	7.503
Sample Diameter	2.850	7.239	2.845	7.226
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 160.6    DW= 133.8	20.0	WW= 225.1    DW= 187.0	20.4
Sample Wet Weight (grams)	639.3		638.8	
Wet Density (pcf)	127.3		129.6	
Dry Density (pcf)	106.0		107.7	
Saturation (%)	ASSUMED SG= 2.7	92	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-19-08	3:52:30		9.8	1.58	22	15				
	2-19-08	4:20:09	0:27:39	9.2	1.60	22	14	2.0E-08	0.953	1.9E-08	
	2-19-08	4:24:45	0:32:15	9.1	1.61	22	14	2.0E-08	0.953	1.9E-08	
	2-19-08	4:30:12	0:37:42	9.0	1.61	22	14	1.9E-08	0.953	1.9E-08	
	2-19-08	4:36:15	0:43:45	8.9	1.61	22	13	1.9E-08	0.953	1.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.9E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +3.8

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LTP-2-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 2</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>LIGHT BROWN &amp; GREY FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.970	7.544
Sample Diameter	2.850	7.239	2.851	7.242
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 164.9    DW= 135.2	22.0	WW= 240.6    DW= 196.1	22.7
Sample Wet Weight (grams)	631.5		633.3	
Wet Density (pcf)	125.7		127.2	
Dry Density (pcf)	103.1		103.7	
Saturation (%)	ASSUMED SG= 2.7	93	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	8:02:14		9.8	1.58	21	15				
-	2-20-08	8:48:23	0:46:09	9.0	1.61	21	14	1.6E-08	0.976	1.6E-08	
	2-20-08	8:54:03	0:51:49	8.9	1.61	21	13	1.6E-08	0.976	1.6E-08	
	2-20-08	9:00:16	0:58:02	8.8	1.62	21	13	1.6E-08	0.976	1.6E-08	
	2-20-08	9:06:49	1:04:35	8.7	1.62	21	13	1.6E-08	0.976	1.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.6E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.7

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +4.0

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LTP-3-1</u>	SAMPLE LOCATION:	<u>TEST PAD LIFT 3</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>LIGHT BROWN &amp; GREY FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.948	7.488
Sample Diameter	2.850	7.239	2.854	7.249
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 151.5    DW= 124.2	22.0	WW= 216.2    DW= 175.3	23.3
Sample Wet Weight (grams)	613.1		621.6	
Wet Density (pcf)	122.0		125.6	
Dry Density (pcf)	100.0		101.8	
Saturation (%)	ASSUMED SG= 2.7	87	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-19-08	3:55:27		10.2	1.98	22	15				
	2-19-08	4:21:34	0:26:07	9.0	2.03	22	13	4.3E-08	0.953	4.1E-08	
	2-19-08	4:23:57	0:28:30	8.9	2.03	22	13	4.3E-08	0.953	4.1E-08	
	2-19-08	4:26:31	0:31:04	8.8	2.03	22	12	4.3E-08	0.953	4.1E-08	
	2-19-08	4:29:14	0:33:47	8.7	2.04	22	12	4.3E-08	0.953	4.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.1E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.8

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +7.7

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-13-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LTP-4-1</u>	SAMPLE LOCATION:	<u>TEST PAD LIFT 4</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>LIGHT BROWN &amp; GREY FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.000	7.620	2.967	7.536
Sample Diameter	2.850	7.239	2.848	7.234
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 128.0    DW= 104.1	23.0	WW= 236.8    DW= 194.0	22.1
Sample Wet Weight (grams)	630.5		628.1	
Wet Density (pcf)	125.5		126.6	
Dry Density (pcf)	102.1		103.7	
Saturation (%)	ASSUMED SG= 2.7	95	95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	8:02:51		10.2	1.98	21	15				
	2-20-08	8:50:13	0:47:22	8.0	2.07	21	11	4.7E-08	0.976	4.6E-08	
	2-20-08	8:52:42	0:49:51	7.9	2.07	21	11	4.7E-08	0.976	4.6E-08	
	2-20-08	8:55:23	0:52:32	7.8	2.07	21	11	4.7E-08	0.976	4.6E-08	
	2-20-08	8:58:07	0:55:16	7.7	2.08	21	10	4.7E-08	0.976	4.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.6E-08      cm/sec**

% COMPACTION OF STD. PROCTOR MAX. DRY DENSITY (ASTM D 698):      95.6

% WETTER THAN OPTIMUM MOISTURE CONTENT (ASTM D 698):      +6.5

**SUMMARY OF UNDISTURBED SAMPLES HYDRAULIC  
CONDUCTIVITY TEST RESULTS**

# SUMMARY OF CLAY LINER HYDRAULIC CONDUCTIVITY TESTING

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BLE Project No. J07-1001-58

Cell No. 12 area = 667,000 sq ft (15.3 Acres) = 48,177 cy Clay Liner

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-1-1	1	CLD-2	22	4.6 E-08	PASS
LP-1-2	1	CLD-7	25	7.5 E-08	PASS
LP-1-3	1	CLD-10	13	4.1 E-08	PASS
LP-1-4	1	CLD-15	29	4.2 E-08	PASS
LP-1-5	1	CLD-20	5	3.6 E-08	PASS
LP-1-6	1	CLD-23	18	3.9 E-08	PASS
LP-1-7	1	CLD-29	42	3.4 E-08	PASS
LP-1-8	1	CLD-32	56	2.1 E-08	PASS
LP-1-9	1	CLD-37	38	2.9 E-08	PASS
LP-1-10	1	CLD-40	52	2.2 E-08	PASS
LP-1-11	1	CLD-43	60	5.0 E-08	PASS
LP-1-12	1	CLD-48	46	1.8 E-08	PASS
LP-1-13	1	CLD-95	33	3.6 E-08	PASS
LP-1-14	1	CLD-97	49	6.4 E-08	PASS
LP-1-15	1	CLD-238	20	3.1 E-08	PASS
LP-1-16	1	CLD-243	51	3.6 E-08	PASS

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-2-1	2	CLD-54	55	5.1 E-08	PASS
LP-2-2	2	CLD-60	41	2.1 E-08	PASS
LP-2-3	2	CLD-62	37	3.6 E-08	PASS
LP-2-4	2	CLD-67	10	3.0 E-08	PASS
LP-2-5	2	CLD-71	12	6.1 E-08	PASS
LP-2-6	2	CLD-121	3	1.7 E-08	PASS
LP-2-7	2	CLD-126	28	3.5 E-08	PASS
LP-2-8	2	CLD-128	59	2.8 E-08	PASS
LP-2-9	2	CLD-133	45	2.5 E-08	PASS
LP-2-10	2	CLD-135	16	3.4 E-08	PASS
LP-2-11	2	CLD-139	31	2.6 E-08	PASS
LP-2-12	2	CLD-142	63	2.5 E-08	PASS
LP-2-13	2	CLD-146	7	2.5 E-08	PASS
LP-2-14	2	CLD-148	64	2.9 E-08	PASS
LP-2-15	2	CLD-157	66	1.7 E-08	PASS
LP-2-16	2	CLD-250	35	2.6 E-08	PASS

Project Specification:  $k < 1 \text{ E-}07 \text{ cm/s}$

(TP): Test Pad Sample

Updated on: 5/30/2008

Updated by: Helvey

# SUMMARY OF CLAY LINER HYDRAULIC CONDUCTIVITY TESTING

CONSTRUCTION OF CELL NO. 12  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA  
 BLE Project No. J07-1001-58

Cell No. 12 area = 667,000 sq ft (15.3 Acres) = 48,177 cy Clay Liner

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-3-1	3	CLD-72	57	2.0 E-08	PASS
LP-3-2	3	CLD-74	53	2.2 E-08	PASS
LP-3-3	3	CLD-76	54	3.3 E-08	PASS
LP-3-4	3	CLD-86	11	3.3 E-08	PASS
LP-3-5	3	CLD-90	10	2.8 E-08	PASS
LP-3-6	3	CLD-159	27	1.8 E-08	PASS
LP-3-7	3	CLD-163	43	2.6 E-08	PASS
LP-3-8	3	CLD-168	15	2.6 E-08	PASS
LP-3-9	3	CLD-176	61	4.6 E-08	PASS
LP-3-10	3	CLD-180	17	1.5 E-08	PASS
LP-3-11	3	CLD-182	1	1.4 E-08	PASS
LP-3-12	3	CLD-186	47	1.3 E-08	PASS
LP-3-13	3	CLD-192	65	4.9 E-08	PASS
LP-3-14	3	CLD-194	19	3.4 E-08	PASS
LP-3-15	3	CLD-255	67	4.7 E-08	PASS
LP-3-16	3	CLD-262	9	2.80E-08	PASS

SAMPLE NUMBER	LIFT NUMBER	FIELD DENSITY TEST NUMBER	MAP GRID LOCATION	HYDRAULIC CONDUCTIVITY (PERMEABILITY) cm/s	STATUS
(TP)LP-4-1	4	CLD-98	36	2.8 E-08	PASS
LP-4-2	4	CLD-104	26	4.7 E-08	PASS
LP-4-3	4	CLD-106	24	3.5 E-08	PASS
LP-4-4	4	CLD-108	40	2.2 E-08	PASS
LP-4-5	4	CLD-109	39	2.4 E-08	PASS
LP-4-6	4	CLD-201	58	4.7 E-08	PASS
LP-4-7	4	CLD-205	14	2.8 E-08	PASS
LP-4-8	4	CLD-208	44	2.7 E-08	PASS
LP-4-9	4	CLD-214	30	2.0 E-08	PASS
LP-4-10	4	CLD-217	62	4.3 E-08	PASS
LP-4-11	4	CLD-221	6	4.0 E-08	PASS
LP-4-12	4	CLD-225	32	3.9 E-08	PASS
LP-4-13	4	CLD-229	48	2.6 E-08	PASS
LP-4-14	4	CLD-231	19	1.9 E-08	PASS
LP-4-15	4	CLD-266	68	1.80E-08	PASS
LP-4-16	4	CLD-270	21	3.1E-08	PASS

Project Specification:  $k < 1 \text{ E-}07 \text{ cm/s}$

(TP): Test Pad Sample

Updated on: 5/30/2008

Updated by: Helvey

**HYDRAULIC CONDUCTIVITY TEST REPORTS**  
**UNDISTURBED SAMPLES**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-1-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.960	7.518	2.916	7.407
Sample Diameter	2.859	7.262	2.852	7.244
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 132.7    DW= 107.2	23.8	WW= 234.1    DW= 188.4	24.3
Sample Wet Weight (grams)	619.3		617.2	
Wet Density (pcf)	124.2		126.2	
Dry Density (pcf)	100.3		101.6	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	12:24:40		9.7	1.58	21	15				
	1-30-08	12:50:56	0:26:16	8.4	1.63	21	13	4.7E-08	0.976	4.6E-08	
	1-30-08	12:53:10	0:28:30	8.3	1.64	21	12	4.7E-08	0.976	4.6E-08	
	1-30-08	12:55:32	0:30:52	8.2	1.64	21	12	4.7E-08	0.976	4.5E-08	
	1-30-08	12:57:56	0:33:16	8.1	1.65	21	12	4.6E-08	0.976	4.5E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-2</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.975	7.557	2.952	7.498
Sample Diameter	2.862	7.269	2.853	7.247
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 159.6    DW= 127.8	24.9	WW= 195.5    DW= 156.4	25.0
Sample Wet Weight (grams)	615.1		614.8	
Wet Density (pcf)	122.4		124.1	
Dry Density (pcf)	98.0		99.3	
Saturation (%)	ASSUMED SG= 2.7	94	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	12:25:00		10.1	1.98	21	15				
	1-30-08	12:49:41	0:24:41	8.2	2.06	21	11	7.6E-08	0.976	7.5E-08	
	1-30-08	12:51:12	0:26:12	8.1	2.06	21	11	7.6E-08	0.976	7.5E-08	
	1-30-08	12:52:44	0:27:44	8.0	2.07	21	11	7.6E-08	0.976	7.5E-08	
	1-30-08	12:54:19	0:29:19	7.9	2.07	21	11	7.6E-08	0.976	7.4E-08	

**HYDRAULIC CONDUCTIVITY (k)      7.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-3</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.957	7.511	2.927	7.435
Sample Diameter	2.860	7.264	2.861	7.267
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 131.8    DW= 108.5	21.5	WW= 205.7    DW= 168.1	22.4
Sample Wet Weight (grams)	623.0		621.5	
Wet Density (pcf)	124.9		125.8	
Dry Density (pcf)	102.8		102.8	
Saturation (%)	ASSUMED SG= 2.7	91	95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	1-30-08	1:09:25		9.7	1.58	21	15			
	1-30-08	1:31:16	0:21:51	8.7	1.62	21	13	4.2E-08	0.976	4.1E-08
	1-30-08	1:33:49	0:24:24	8.6	1.63	21	13	4.2E-08	0.976	4.1E-08
	1-30-08	1:36:27	0:27:02	8.5	1.63	21	13	4.2E-08	0.976	4.1E-08
	1-30-08	1:38:50	0:29:25	8.4	1.63	21	13	4.2E-08	0.976	4.1E-08

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>4.1E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-4</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.944	7.478	2.916	7.407
Sample Diameter	2.861	7.267	2.851	7.242
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 146.6    DW= 120.7	21.5	WW= 228.6    DW= 187.0	22.2
Sample Wet Weight (grams)	630.5		630.1	
Wet Density (pcf)	126.9		128.9	
Dry Density (pcf)	104.5		105.5	
Saturation (%)	ASSUMED SG= 2.7	95	101	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	1-30-08	1:09:54		10.0	1.98	21	15			
	1-30-08	1:31:38	0:21:44	9.0	2.03	21	13	4.3E-08	0.976	4.2E-08
	1-30-08	1:34:05	0:24:11	8.9	2.03	21	13	4.3E-08	0.976	4.2E-08
	1-30-08	1:36:29	0:26:35	8.8	2.03	21	13	4.3E-08	0.976	4.2E-08
	1-30-08	1:39:03	0:29:09	8.7	2.04	21	12	4.2E-08	0.976	4.1E-08

**HYDRAULIC CONDUCTIVITY (k)      4.2E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-5</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.951	7.496	2.930	7.442
Sample Diameter	2.860	7.264	2.858	7.259
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 170.1    DW= 139.5	21.9	WW= 224.4    DW= 183.9	22.0
Sample Wet Weight (grams)	627.7		630.3	
Wet Density (pcf)	126.1		127.7	
Dry Density (pcf)	103.4		104.7	
Saturation (%)	ASSUMED SG= 2.7	94	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
(PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	6:11:05		10.1	1.98	21	15				
	1-30-08	6:33:34	0:22:29	9.2	2.02	21	13	3.7E-08	0.976	3.6E-08	
	1-30-08	6:36:15	0:25:10	9.1	2.02	21	13	3.7E-08	0.976	3.6E-08	
	1-30-08	6:39:05	0:28:00	9.0	2.03	21	13	3.6E-08	0.976	3.6E-08	
	1-30-08	6:41:48	0:30:43	8.9	2.03	21	13	3.6E-08	0.976	3.6E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-6</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.955	7.506	2.928	7.437
Sample Diameter	2.857	7.257	2.860	7.264
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 165.2    DW= 136.8	20.8	WW= 207.5    DW= 169.3	22.6
Sample Wet Weight (grams)	622.1		624.3	
Wet Density (pcf)	125.1		126.4	
Dry Density (pcf)	103.6		103.2	
Saturation (%)	ASSUMED SG= 2.7	89	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	1-30-08	6:14:52		9.7	1.58	21	15				
	1-30-08	6:33:15	0:18:23	8.9	1.61	21	14	4.0E-08	0.976	3.9E-08	
	1-30-08	6:35:41	0:20:49	8.8	1.62	21	13	4.0E-08	0.976	3.9E-08	
	1-30-08	6:38:19	0:23:27	8.7	1.62	21	13	3.9E-08	0.976	3.8E-08	
	1-30-08	6:40:58	0:26:06	8.6	1.63	21	13	3.9E-08	0.976	3.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.9E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-29-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-7</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.012	7.650	3.006	7.635
Sample Diameter	2.855	7.252	2.856	7.254
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 145.0    DW= 120.0	20.8	WW= 235.2    DW= 195.2	20.5
Sample Wet Weight (grams)	643.7		647.0	
Wet Density (pcf)	127.2		128.0	
Dry Density (pcf)	105.2		106.2	
Saturation (%)	ASSUMED SG= 2.7	94	94	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	3:47:53		10.2	1.98	21	15				
	2-4-08	4:14:28	0:26:35	9.2	2.02	21	13	3.5E-08	0.976	3.4E-08	
	2-4-08	4:17:15	0:29:22	9.1	2.02	21	13	3.5E-08	0.976	3.4E-08	
	2-4-08	4:20:08	0:32:15	9.0	2.03	21	13	3.5E-08	0.976	3.4E-08	
	2-4-08	4:23:13	0:35:20	8.9	2.03	21	13	3.5E-08	0.976	3.4E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-8</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.933	7.450	2.929	7.440
Sample Diameter	2.857	7.257	2.861	7.267
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 106.1    DW= 87.2	21.7	WW= 218.9    DW= 179.1	22.2
Sample Wet Weight (grams)	623.7		626.7	
Wet Density (pcf)	126.4		126.8	
Dry Density (pcf)	103.9		103.7	
Saturation (%)	ASSUMED SG= 2.7	94	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	2:20:04		9.6	1.58	21	15				
	2-1-08	2:54:50	0:34:46	8.8	1.62	21	13	2.1E-08	0.976	2.1E-08	
	2-1-08	2:58:47	0:38:43	8.7	1.62	21	13	2.1E-08	0.976	2.1E-08	
	2-1-08	3:03:23	0:43:19	8.6	1.63	21	13	2.1E-08	0.976	2.1E-08	
	2-1-08	3:08:12	0:48:08	8.5	1.63	21	13	2.1E-08	0.976	2.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-9</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.938	7.463	2.911	7.394
Sample Diameter	2.850	7.239	2.851	7.242
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 115.7    DW= 93.3	24.0	WW= 206.2    DW= 166.3	24.0
Sample Wet Weight (grams)	613.4		615.1	
Wet Density (pcf)	124.7		126.1	
Dry Density (pcf)	100.5		101.7	
Saturation (%)	ASSUMED SG= 2.7	96	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-6-08	2:23:20		9.6	1.58	21	15				
	2-6-08	2:58:32	0:35:12	8.5	1.63	21	13	2.9E-08	0.976	2.9E-08	
	2-6-08	3:02:03	0:38:43	8.4	1.63	21	13	2.9E-08	0.976	2.9E-08	
	2-6-08	3:05:41	0:42:21	8.3	1.64	21	12	2.9E-08	0.976	2.9E-08	
	2-6-08	3:09:38	0:46:18	8.2	1.64	21	12	2.9E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.9E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-10</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.935	7.455	2.923	7.424
Sample Diameter	2.859	7.262	2.863	7.272
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 135.4 DW= 111.8	21.1	WW= 205.2 DW= 169.7	20.9
Sample Wet Weight (grams)	629.6		633.0	
Wet Density (pcf)	127.3		128.1	
Dry Density (pcf)	105.1		106.0	
Saturation (%)	ASSUMED SG= 2.7 95		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	3:14:23		9.6	1.58	21	15				
	2-1-08	3:54:36	0:40:13	8.6	1.63	21	13	2.3E-08	0.976	2.3E-08	
	2-1-08	3:59:03	0:44:40	8.5	1.63	21	13	2.3E-08	0.976	2.2E-08	
	2-1-08	4:03:39	0:49:16	8.4	1.63	21	13	2.3E-08	0.976	2.2E-08	
	2-1-08	4:08:29	0:54:06	8.3	1.64	21	13	2.3E-08	0.976	2.2E-08	

**HYDRAULIC CONDUCTIVITY (k) 2.2E-08 cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-11</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.911	7.394	2.900	7.366
Sample Diameter	2.857	7.257	2.852	7.244
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 111.7    DW= 91.2	22.5	WW= 227.1    DW= 185.7	22.3
Sample Wet Weight (grams)	613.1		615.2	
Wet Density (pcf)	125.2		126.5	
Dry Density (pcf)	102.2		103.4	
Saturation (%)	ASSUMED SG= 2.7	94	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)    75		Influent Pressure (psi)    60				Effluent Pressure (psi)    60				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-1-08	2:55:10		10.0	1.98	21	15			
	2-1-08	3:21:02	0:25:52	8.6	2.04	21	12	5.1E-08	0.976	5.0E-08
	2-1-08	3:23:19	0:28:09	8.5	2.05	21	12	5.1E-08	0.976	5.0E-08
	2-1-08	3:25:42	0:30:32	8.4	2.05	21	12	5.1E-08	0.976	4.9E-08
	2-1-08	3:27:58	0:32:48	8.3	2.05	21	12	5.0E-08	0.976	4.9E-08

**HYDRAULIC CONDUCTIVITY (k)    5.0E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-12</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.969	7.541	2.955	7.506
Sample Diameter	2.860	7.264	2.848	7.234
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 153.8    DW= 131.4	17.0	WW= 207.9    DW= 170.9	21.7
Sample Wet Weight (grams)	637.1		638.2	
Wet Density (pcf)	127.2		129.2	
Dry Density (pcf)	108.7		106.2	
Saturation (%)	ASSUMED SG= 2.7	84	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	4:19:11		9.7	1.58	21	15				
	2-1-08	4:33:41	0:14:30	9.4	1.59	21	14	1.8E-08	0.976	1.8E-08	
	2-1-08	4:38:51	0:19:40	9.3	1.60	21	14	1.8E-08	0.976	1.8E-08	
	2-1-08	4:44:05	0:24:54	9.2	1.60	21	14	1.8E-08	0.976	1.8E-08	
	2-1-08	4:49:29	0:30:18	9.1	1.61	21	14	1.8E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-13</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.930	7.442	2.909	7.389
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 120.8    DW= 93.1	29.8	WW= 165.7    DW= 132.0	25.5
Sample Wet Weight (grams)	604.4		602.5	
Wet Density (pcf)	122.4		123.4	
Dry Density (pcf)	94.3		98.3	
Saturation (%)	ASSUMED SG= 2.7	102	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	2:20:42		10.0	1.98	21	15			
	2-6-08	2:45:15	0:24:33	9.0	2.03	21	13	3.8E-08	0.976	3.7E-08
	2-6-08	2:48:05	0:27:23	8.9	2.03	21	13	3.8E-08	0.976	3.7E-08
	2-6-08	2:51:08	0:30:26	8.8	2.03	21	13	3.7E-08	0.976	3.6E-08
	2-6-08	2:54:17	0:33:35	8.7	2.04	21	13	3.7E-08	0.976	3.6E-08

**HYDRAULIC CONDUCTIVITY (k)      3.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-14</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.936	7.457	2.876	7.305
Sample Diameter	2.862	7.269	2.842	7.219
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 130.0    DW= 102.8	26.5	WW= 203.0    DW= 160.2	26.7
Sample Wet Weight (grams)	585.4		579.1	
Wet Density (pcf)	118.1		120.9	
Dry Density (pcf)	93.4		95.4	
Saturation (%)	ASSUMED SG= 2.7	89	94	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	3:11:10		9.6	1.58	21	15			
	2-6-08	3:34:43	0:23:33	8.0	1.65	21	12	6.6E-08	0.976	6.4E-08
	2-6-08	3:36:38	0:25:28	7.9	1.65	21	12	6.5E-08	0.976	6.4E-08
	2-6-08	3:38:30	0:27:20	7.8	1.66	21	12	6.5E-08	0.976	6.3E-08
	2-6-08	3:40:26	0:29:16	7.7	1.66	21	11	6.5E-08	0.976	6.3E-08

**HYDRAULIC CONDUCTIVITY (k)      6.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-1-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-1-15</u>	SAMPLE LOCATION: <u>LINER LIFT 1</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.939	7.465	2.903	7.374
Sample Diameter	2.850	7.239	2.844	7.224
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 127.6    DW= 102.9	24.0	WW= 232.4    DW= 186.8	24.4
Sample Wet Weight (grams)	619.9		616.2	
Wet Density (pcf)	126.0		127.3	
Dry Density (pcf)	101.6		102.3	
Saturation (%)	ASSUMED SG= 2.7    98		102	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-4-08	1:01:45		9.6	1.58	22	15				
	3-4-08	1:23:53	0:22:08	8.8	1.62	22	13	3.3E-08	0.953	3.2E-08	
	3-4-08	1:26:58	0:25:13	8.7	1.62	22	13	3.3E-08	0.953	3.2E-08	
	3-4-08	1:30:17	0:28:32	8.6	1.63	22	13	3.3E-08	0.953	3.1E-08	
	3-4-08	1:33:39	0:31:54	8.5	1.63	22	13	3.3E-08	0.953	3.1E-08	

**HYDRAULIC CONDUCTIVITY (k)    3.1E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-1-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-1-16</u>	SAMPLE LOCATION:	<u>LINER LIFT 1</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.920	7.417	2.894	7.351
Sample Diameter	2.858	7.259	2.841	7.216
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 185.8    DW= 150.9	23.1	WW= 201.7    DW= 164.9	22.3
Sample Wet Weight (grams)	616.2		613.2	
Wet Density (pcf)	125.3		127.3	
Dry Density (pcf)	101.8		104.1	
Saturation (%)	ASSUMED SG= 2.7    95		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	3-4-08	1:01:05		10.0	1.98	22	15			
	3-4-08	1:20:14	0:19:09	9.2	2.02	22	14	3.8E-08	0.953	3.6E-08
	3-4-08	1:22:51	0:21:46	9.1	2.02	22	13	3.8E-08	0.953	3.6E-08
	3-4-08	1:25:29	0:24:24	9.0	2.03	22	13	3.8E-08	0.953	3.6E-08
	3-4-08	1:28:15	0:27:10	8.9	2.03	22	13	3.8E-08	0.953	3.6E-08

**HYDRAULIC CONDUCTIVITY (k)    3.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-2-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.010	7.645	2.969	7.541
Sample Diameter	2.855	7.252	2.851	7.242
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 130.3    DW= 105.9	23.0	WW= 200.3    DW= 163.6	22.4
Sample Wet Weight (grams)	631.7		633.6	
Wet Density (pcf)	124.9		127.3	
Dry Density (pcf)	101.5		104.0	
Saturation (%)	ASSUMED SG= 2.7    94		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-1-08	4:18:50		10.2	1.98	21	15				
	2-1-08	4:34:44	0:15:54	9.3	2.01	21	13	5.2E-08	0.976	5.1E-08	
	2-1-08	4:36:35	0:17:45	9.2	2.02	21	13	5.2E-08	0.976	5.1E-08	
	2-1-08	4:38:28	0:19:38	9.1	2.02	21	13	5.2E-08	0.976	5.1E-08	
	2-1-08	4:40:31	0:21:41	9.0	2.03	21	13	5.2E-08	0.976	5.1E-08	

**HYDRAULIC CONDUCTIVITY (k)    5.1E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-2</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.874	7.300	2.859	7.262
Sample Diameter	2.859	7.262	2.850	7.239
Length/Diameter Ratio		1.01		
Moisture Content (%)	WW= 155.0 DW= 127.8	21.3	WW= 219.6 DW= 181.1	21.3
Sample Wet Weight (grams)	610.5		614.9	
Wet Density (pcf)	126.1		128.4	
Dry Density (pcf)	103.9		105.9	
Saturation (%)	ASSUMED SG= 2.7	93	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-1-08	9:26:58		9.5	1.59	21	15			
	2-1-08	9:47:13	0:20:15	9.0	1.61	21	14	2.2E-08	0.976	2.1E-08
	2-1-08	9:51:25	0:24:27	8.9	1.61	21	14	2.2E-08	0.976	2.1E-08
	2-1-08	9:55:39	0:28:41	8.8	1.62	21	14	2.2E-08	0.976	2.1E-08
	2-1-08	10:00:21	0:33:23	8.7	1.62	21	14	2.2E-08	0.976	2.1E-08

**HYDRAULIC CONDUCTIVITY (k)      2.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-31-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-3</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.930	7.442	2.901	7.369
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 93.2    DW= 76.5	21.8	WW= 186.5    DW= 152.2	22.5
Sample Wet Weight (grams)	612.6		614.7	
Wet Density (pcf)	124.1		126.3	
Dry Density (pcf)	101.8		103.0	
Saturation (%)	ASSUMED SG= 2.7 90		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-1-08	10:23:57		10.0	1.98	21	15			
	2-1-08	10:41:10	0:17:13	9.3	2.01	21	14	3.7E-08	0.976	3.6E-08
	2-1-08	10:43:48	0:19:51	9.2	2.02	21	13	3.7E-08	0.976	3.6E-08
	2-1-08	10:46:32	0:22:35	9.1	2.02	21	13	3.7E-08	0.976	3.6E-08
	2-1-08	10:49:26	0:25:29	9.0	2.03	21	13	3.6E-08	0.976	3.6E-08

**HYDRAULIC CONDUCTIVITY (k)      3.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-4</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.922	7.422	2.906	7.381
Sample Diameter	2.862	7.269	2.861	7.267
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 138.0    DW= 112.8	22.3	WW= 209.1    DW= 171.5	21.9
Sample Wet Weight (grams)	626.4		627.4	
Wet Density (pcf)	126.9		127.9	
Dry Density (pcf)	103.8		104.9	
Saturation (%)	ASSUMED SG= 2.7 97		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	3:35:07		9.6	1.58	21	15				
	2-4-08	4:06:58	0:31:51	8.6	1.63	21	13	2.9E-08	0.976	2.8E-08	
	2-4-08	4:07:10	0:32:03	8.5	1.63	21	13	3.2E-08	0.976	3.1E-08	
	2-4-08	4:10:29	0:35:22	8.4	1.63	21	13	3.2E-08	0.976	3.1E-08	
	2-4-08	4:13:51	0:38:44	8.3	1.64	21	13	3.2E-08	0.976	3.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-5</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.924	7.427	2.915	7.404
Sample Diameter	2.859	7.262	2.844	7.224
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 168.2    DW= 141.7	18.7	WW= 220.2    DW= 172.6	27.6
Sample Wet Weight (grams)	605.0		610.2	
Wet Density (pcf)	122.8		125.5	
Dry Density (pcf)	103.4		98.4	
Saturation (%)	ASSUMED SG= 2.7    80		105	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	11:15:29		10.0	1.98	21	15				
	2-4-08	11:40:11	0:24:42	8.4	2.05	21	12	6.3E-08	0.976	6.1E-08	
	2-4-08	11:41:55	0:26:26	8.3	2.05	21	12	6.3E-08	0.976	6.1E-08	
	2-4-08	11:43:48	0:28:19	8.2	2.06	21	12	6.3E-08	0.976	6.1E-08	
	2-4-08	11:45:45	0:30:16	8.1	2.06	21	11	6.2E-08	0.976	6.1E-08	

**HYDRAULIC CONDUCTIVITY (k)      6.1E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-6</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.924	7.427	2.889	7.338
Sample Diameter	2.860	7.264	2.854	7.249
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 173.2    DW= 142.8	21.3	WW= 202.1    DW= 165.1	22.4
Sample Wet Weight (grams)	621.7		623.0	
Wet Density (pcf)	126.1		128.4	
Dry Density (pcf)	104.0		104.9	
Saturation (%)	ASSUMED SG= 2.7	93	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)    85		Influent Pressure (psi)    70				Effluent Pressure (psi)    70				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	2:48:34		9.6	1.58	21	15			
	2-8-08	3:14:17	0:25:43	9.1	1.61	21	14	1.7E-08	0.976	1.7E-08
	2-8-08	3:19:30	0:30:56	9.0	1.61	21	14	1.7E-08	0.976	1.7E-08
	2-8-08	3:24:56	0:36:22	8.9	1.61	21	14	1.7E-08	0.976	1.7E-08
	2-8-08	3:30:39	0:42:05	8.8	1.62	21	14	1.7E-08	0.976	1.7E-08

**HYDRAULIC CONDUCTIVITY (k)    1.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-7</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.941	7.470	2.919	7.414
Sample Diameter	2.858	7.259	2.852	7.244
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 139.1    DW= 112.0	24.2	WW= 183.7    DW= 148.2	24.0
Sample Wet Weight (grams)	612.7		615.2	
Wet Density (pcf)	123.7		125.7	
Dry Density (pcf)	99.6		101.4	
Saturation (%)	ASSUMED SG= 2.7 94		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85	Influent Pressure (psi)		70	Effluent Pressure (psi)		70		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	2:40:11		10.0	1.98	21	15			
	2-8-08	3:05:12	0:25:01	9.0	2.03	21	13	3.7E-08	0.976	3.6E-08
	2-8-08	3:08:26	0:28:15	8.9	2.03	21	13	3.7E-08	0.976	3.6E-08
	2-8-08	3:11:47	0:31:36	8.8	2.03	21	13	3.6E-08	0.976	3.5E-08
	2-8-08	3:15:06	0:34:55	8.7	2.04	21	12	3.5E-08	0.976	3.5E-08

**HYDRAULIC CONDUCTIVITY (k)      3.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-8</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.986	7.584	2.949	7.490
Sample Diameter	2.854	7.249	2.841	7.216
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 130.4	DW= 106.5	22.4	WW= 214.5 DW= 175.7 22.1
Sample Wet Weight (grams)	628.7		627.4	
Wet Density (pcf)	125.4		127.9	
Dry Density (pcf)	102.4		104.7	
Saturation (%)	ASSUMED SG= 2.7 94		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	3:33:36		9.8	1.58	21	15				
	2-8-08	3:59:27	0:25:51	9.0	1.61	21	14	2.8E-08	0.976	2.7E-08	
	2-8-08	4:02:41	0:29:05	8.9	1.61	21	13	2.8E-08	0.976	2.8E-08	
	2-8-08	4:06:04	0:32:28	8.8	1.62	21	13	2.8E-08	0.976	2.8E-08	
	2-8-08	4:09:44	0:36:08	8.7	1.62	21	13	2.8E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-9</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.967	7.536	2.927	7.435
Sample Diameter	2.861	7.267	2.852	7.244
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 129.8 DW= 104.8	23.9	WW= 203.5 DW= 164.4	23.8
Sample Wet Weight (grams)	617.9		618.8	
Wet Density (pcf)	123.4		126.1	
Dry Density (pcf)	99.6		101.8	
Saturation (%)	ASSUMED SG= 2.7	93	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85	Influent Pressure (psi)		70	Effluent Pressure (psi)		70			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	3:19:40		10.1	1.98	21	15				
	2-8-08	3:48:05	0:28:25	9.3	2.01	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	3:51:27	0:31:47	9.2	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	3:55:11	0:35:31	9.1	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	3:59:26	0:39:46	9.0	2.03	21	13	2.6E-08	0.976	2.5E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-10</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.873	7.297	2.843	7.221
Sample Diameter	2.855	7.252	2.852	7.244
Length/Diameter Ratio		1.01		
Moisture Content (%)	WW= 179.2    DW= 148.3	20.8	WW= 210.6    DW= 172.4	22.2
Sample Wet Weight (grams)	605.5		604.4	
Wet Density (pcf)	125.4		126.8	
Dry Density (pcf)	103.8		103.8	
Saturation (%)	ASSUMED SG= 2.7	90	96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85	Influent Pressure (psi)		70	Effluent Pressure (psi)		70		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	4:16:17		9.4	1.59	21	15			
	2-8-08	4:29:11	0:12:54	8.9	1.61	21	14	3.5E-08	0.976	3.4E-08
	2-8-08	4:31:51	0:15:34	8.8	1.62	21	14	3.5E-08	0.976	3.4E-08
	2-8-08	4:34:45	0:18:28	8.7	1.62	21	14	3.5E-08	0.976	3.4E-08
	2-8-08	4:37:39	0:21:22	8.6	1.63	21	13	3.5E-08	0.976	3.4E-08

**HYDRAULIC CONDUCTIVITY (k)      3.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-11</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.015	7.658	2.973	7.551
Sample Diameter	2.860	7.264	2.845	7.226
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 135.9 DW= 109.9	23.7	WW= 204.1 DW= 164.5	24.1
Sample Wet Weight (grams)	630.3		629.6	
Wet Density (pcf)	124.0		126.9	
Dry Density (pcf)	100.3		102.3	
Saturation (%)	ASSUMED SG= 2.7	94	100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	4:01:37		10.2	1.98	21	15			
	2-8-08	4:29:13	0:27:36	9.4	2.01	21	13	2.7E-08	0.976	2.6E-08
	2-8-08	4:32:23	0:30:46	9.3	2.01	21	13	2.7E-08	0.976	2.6E-08
	2-8-08	4:35:56	0:34:19	9.2	2.02	21	13	2.7E-08	0.976	2.6E-08
	2-8-08	4:39:29	0:37:52	9.1	2.02	21	13	2.7E-08	0.976	2.6E-08

**HYDRAULIC CONDUCTIVITY (k)      2.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-2-12</u>	SAMPLE LOCATION: <u>LINER LIFT 2</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.916	7.407	2.879	7.313
Sample Diameter	2.861	7.267	2.853	7.247
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 142.6 DW= 115.2	23.8	WW= 235.4 DW= 191.0	23.2
Sample Wet Weight (grams)	611.4		611.4	
Wet Density (pcf)	124.2		126.5	
Dry Density (pcf)	100.4		102.7	
Saturation (%)	ASSUMED SG= 2.7	95	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) 85		Influent Pressure (psi) 70				Effluent Pressure (psi) 70				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-8-08	4:42:33		9.6	1.58	21	15			
	2-8-08	5:17:51	0:35:18	8.6	1.63	21	13	2.6E-08	0.976	2.5E-08
	2-8-08	5:21:45	0:39:12	8.5	1.63	21	13	2.6E-08	0.976	2.5E-08
	2-8-08	5:25:58	0:43:25	8.4	1.63	21	13	2.6E-08	0.976	2.5E-08
	2-8-08	5:30:26	0:47:53	8.3	1.64	21	13	2.6E-08	0.976	2.5E-08

**HYDRAULIC CONDUCTIVITY (k) 2.5E-08 cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-7-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-13</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.992	7.600	2.962	7.523
Sample Diameter	2.856	7.254	2.847	7.231
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 109.9    DW= 87.5	25.6	WW= 193.4    DW= 159.1	21.6
Sample Wet Weight (grams)	633.4		633.3	
Wet Density (pcf)	125.9		127.9	
Dry Density (pcf)	100.2		105.3	
Saturation (%)	ASSUMED SG= 2.7	102	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-8-08	4:42:15		10.2	1.98	21	15				
	2-8-08	5:18:23	0:36:08	9.2	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	5:21:53	0:39:38	9.1	2.02	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	5:25:19	0:43:04	9.0	2.03	21	13	2.6E-08	0.976	2.5E-08	
	2-8-08	5:29:22	0:47:07	8.9	2.03	21	13	2.6E-08	0.976	2.5E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-8-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-14</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.914	7.402	2.846	7.229
Sample Diameter	2.862	7.269	2.854	7.249
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 141.1    DW= 114.3	23.4	WW= 227.6    DW= 184.4	23.4
Sample Wet Weight (grams)	612.8		614.0	
Wet Density (pcf)	124.5		128.5	
Dry Density (pcf)	100.9		104.1	
Saturation (%)	ASSUMED SG= 2.7    94		102	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-11-08	1:42:48		9.6	1.58	22	15				
	2-11-08	2:13:07	0:30:19	8.6	1.63	22	13	3.0E-08	0.953	2.9E-08	
	2-11-08	2:16:24	0:33:36	8.5	1.63	22	13	3.0E-08	0.953	2.9E-08	
	2-11-08	2:19:50	0:37:02	8.4	1.63	22	13	3.0E-08	0.953	2.9E-08	
	2-11-08	2:23:38	0:40:50	8.3	1.64	22	13	3.0E-08	0.953	2.9E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.9E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-8-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.978	7.564	2.959	7.516
Sample Diameter	2.862	7.269	2.849	7.236
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 143.2    DW= 116.5	22.9	WW= 209.5    DW= 170.2	23.1
Sample Wet Weight (grams)	625.5		627.4	
Wet Density (pcf)	124.4		126.7	
Dry Density (pcf)	101.2		102.9	
Saturation (%)	ASSUMED SG= 2.7    93		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-12-08	12:32:44		9.7	1.58	21	15				
	2-12-08	13:09:08	0:36:24	9.0	1.61	21	14	1.7E-08	0.976	1.7E-08	
	2-12-08	13:14:37	0:41:53	8.9	1.61	21	13	1.7E-08	0.976	1.7E-08	
	2-12-08	13:20:13	0:47:29	8.8	1.62	21	13	1.7E-08	0.976	1.7E-08	
	2-12-08	13:26:09	0:53:25	8.7	1.62	21	13	1.7E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.7E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-1-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-2-16</u>	SAMPLE LOCATION:	<u>LINER LIFT 2</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.907	7.384	2.887	7.333
Sample Diameter	2.859	7.262	2.842	7.219
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 116.4    DW= 95.0	22.5	WW= 254.9    DW= 208.6	22.2
Sample Wet Weight (grams)	608.6		606.4	
Wet Density (pcf)	124.2		126.1	
Dry Density (pcf)	101.4		103.2	
Saturation (%)	ASSUMED SG= 2.7    92		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-4-08	1:39:24		9.9	1.99	22	15				
	3-4-08	1:59:37	0:20:13	9.3	2.01	22	14	2.7E-08	0.953	2.6E-08	
	3-4-08	2:02:56	0:23:32	9.2	2.02	22	14	2.7E-08	0.953	2.6E-08	
	3-4-08	2:06:19	0:26:55	9.1	2.02	22	13	2.7E-08	0.953	2.6E-08	
	3-4-08	2:10:06	0:30:42	9.0	2.03	22	13	2.7E-08	0.953	2.6E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-3-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.952	7.498	2.944	7.478
Sample Diameter	2.860	7.264	2.841	7.216
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 123.5    DW= 101.9	21.2	WW= 240.0    DW= 197.8	21.3
Sample Wet Weight (grams)	635.6		636.7	
Wet Density (pcf)	127.7		130.0	
Dry Density (pcf)	105.3		107.1	
Saturation (%) <small>ASSUMED SG= 2.7</small>	96		101	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	2:50:33		9.7	1.58	21	15				
	2-4-08	3:21:42	0:31:09	9.0	1.61	21	14	2.0E-08	0.976	2.0E-08	
	2-4-08	3:26:10	0:35:37	8.9	1.61	21	14	2.0E-08	0.976	2.0E-08	
	2-4-08	3:31:55	0:41:22	8.8	1.62	21	13	2.0E-08	0.976	1.9E-08	
	2-4-08	3:37:40	0:47:07	8.7	1.62	21	13	2.0E-08	0.976	1.9E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.0E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-2</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.987	7.587	2.982	7.574
Sample Diameter	2.861	7.267	2.854	7.249
Length/Diameter Ratio	1.04			
Moisture Content (%)	WW= 102.5	DW= 83.6	WW= 216.1	DW= 173.3
Sample Wet Weight (grams)	624.5		628.4	
Wet Density (pcf)	123.9		125.5	
Dry Density (pcf)	101.0		100.6	
Saturation (%)	91		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-4-08	4:30:12		10.2	1.98	21	15			
	2-4-08	5:06:31	0:36:19	9.3	2.01	21	13	2.3E-08	0.976	2.2E-08
	2-4-08	5:10:39	0:40:27	9.2	2.02	21	13	2.3E-08	0.976	2.2E-08
	2-4-08	5:14:55	0:44:43	9.1	2.02	21	13	2.3E-08	0.976	2.2E-08
	2-4-08	5:19:27	0:49:15	9.0	2.03	21	13	2.3E-08	0.976	2.2E-08

**HYDRAULIC CONDUCTIVITY (k)      2.2E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-3</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.988	7.590	2.975	7.557
Sample Diameter	2.861	7.267	2.860	7.264
Length/Diameter Ratio	1.04			
Moisture Content (%)	WW= 114.3    DW= 93.5	22.2	WW= 207.1    DW= 168.5	22.9
Sample Wet Weight (grams)	631.4		635.4	
Wet Density (pcf)	125.2		126.7	
Dry Density (pcf)	102.4		103.0	
Saturation (%)	ASSUMED SG= 2.7	93	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
(PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	4:55:33		9.8	1.58	21	15				
	2-4-08	5:29:16	0:33:43	8.6	1.63	21	13	3.3E-08	0.976	3.2E-08	
	2-4-08	5:31:30	0:35:57	8.5	1.63	21	13	3.4E-08	0.976	3.3E-08	
	2-4-08	5:34:51	0:39:18	8.4	1.63	21	12	3.4E-08	0.976	3.3E-08	
	2-4-08	5:38:09	0:42:36	8.3	1.64	21	12	3.4E-08	0.976	3.3E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.3E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-4</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.967	7.536	2.944	7.478
Sample Diameter	2.860	7.264	2.857	7.257
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 166.9    DW= 135.7	23.0	WW= 206.0    DW= 164.6	25.2
Sample Wet Weight (grams)	614.1		616.9	
Wet Density (pcf)	122.7		124.5	
Dry Density (pcf)	99.8		99.5	
Saturation (%)	ASSUMED SG= 2.7    90		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
(PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-4-08	2:49:47		10.1	1.98	21	15				
	2-4-08	3:09:12	0:19:25	9.3	2.01	21	13	3.8E-08	0.976	3.7E-08	
	2-4-08	3:11:53	0:22:06	9.3	2.01	21	13	3.3E-08	0.976	3.2E-08	
	2-4-08	3:14:45	0:24:58	9.2	2.02	21	13	3.3E-08	0.976	3.2E-08	
	2-4-08	3:17:48	0:28:01	9.1	2.02	21	13	3.3E-08	0.976	3.2E-08	

**HYDRAULIC CONDUCTIVITY (k)      3.3E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-2-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-5</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.945	7.480	2.933	7.450
Sample Diameter	2.861	7.267	2.861	7.267
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 145.3    DW= 117.2	24.0	WW= 234.7    DW= 189.6	23.8
Sample Wet Weight (grams)	615.8		620.5	
Wet Density (pcf)	123.9		125.4	
Dry Density (pcf)	99.9		101.3	
Saturation (%)	ASSUMED SG= 2.7	94	97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-5-08	8:19:13		10.0	1.98	21	15				
	2-5-08	8:51:03	0:31:50	9.0	2.03	21	13	2.9E-08	0.976	2.9E-08	
	2-5-08	8:54:33	0:35:20	8.9	2.03	21	13	2.9E-08	0.976	2.8E-08	
	2-5-08	8:58:05	0:38:52	8.8	2.03	21	13	2.9E-08	0.976	2.8E-08	
	2-5-08	9:01:42	0:42:29	8.7	2.04	21	12	2.9E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-6</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.716	6.899	2.696	6.848
Sample Diameter	2.853	7.247	2.859	7.262
Length/Diameter Ratio		0.95		
Moisture Content (%)	WW= 134.5    DW= 112.6	19.4	WW= 218.4    DW= 181.0	20.7
Sample Wet Weight (grams)	568.5		574.4	
Wet Density (pcf)	124.7		126.4	
Dry Density (pcf)	104.4		104.8	
Saturation (%)	ASSUMED SG= 2.7    86		92	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-13-08	1:58:03		9.0	1.61	21	15				
	2-13-08	2:27:18	0:29:15	8.4	1.63	21	14	1.9E-08	0.976	1.8E-08	
	2-13-08	2:32:54	0:34:51	8.3	1.64	21	14	1.8E-08	0.976	1.8E-08	
	2-13-08	2:38:49	0:40:46	8.2	1.64	21	13	1.8E-08	0.976	1.8E-08	
	2-13-08	2:45:27	0:47:24	8.1	1.65	21	13	1.8E-08	0.976	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-7</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.959	7.516	2.960	7.518
Sample Diameter	2.842	7.219	2.861	7.267
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 149.2    DW= 123.9	20.4	WW= 238.4    DW= 196.9	21.1
Sample Wet Weight (grams)	635.0		640.1	
Wet Density (pcf)	128.9		128.1	
Dry Density (pcf)	107.0		105.8	
Saturation (%)	ASSUMED SG= 2.7 96		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	2:27:00		10.1	1.98	21	15			
	2-13-08	3:01:56	0:34:56	9.1	2.02	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:05:31	0:38:31	9.0	2.03	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:09:28	0:42:28	8.9	2.03	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:13:45	0:46:45	8.8	2.03	21	13	2.7E-08	0.976	2.6E-08

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>2.6E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-8</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.930	7.442
Sample Diameter	2.860	7.264	2.864	7.275
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 115.4    DW= 93.9	22.9	WW= 228.7    DW= 185.8	23.1
Sample Wet Weight (grams)	628.1		630.5	
Wet Density (pcf)	126.9		127.2	
Dry Density (pcf)	103.3		103.4	
Saturation (%)	ASSUMED SG= 2.7	98	99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	2:47:17		9.6	1.58	21	15			
	2-13-08	3:25:26	0:38:09	8.5	1.63	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:29:18	0:42:01	8.4	1.63	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:33:47	0:46:30	8.3	1.64	21	13	2.7E-08	0.976	2.6E-08
	2-13-08	3:38:24	0:51:07	8.2	1.64	21	12	2.6E-08	0.976	2.6E-08

**HYDRAULIC CONDUCTIVITY (k)      2.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-9</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.992	7.600	2.996	7.610
Sample Diameter	2.853	7.247	2.855	7.252
Length/Diameter Ratio		1.05		
Moisture Content (%)	WW= 99.9    DW= 83.1	20.2	WW= 227.4    DW= 187.5	21.3
Sample Wet Weight (grams)	634.7		637.7	
Wet Density (pcf)	126.4		126.7	
Dry Density (pcf)	105.2		104.4	
Saturation (%)	ASSUMED SG= 2.7	91	94	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		85	Influent Pressure (psi)		70	Effluent Pressure (psi)		70			
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-13-08	3:24:51		10.2	1.98	21	15				
	2-13-08	4:02:10	0:37:19	8.4	2.05	21	12	4.7E-08	0.976	4.6E-08	
	2-13-08	4:04:56	0:40:05	8.3	2.05	21	12	4.7E-08	0.976	4.6E-08	
	2-13-08	4:07:48	0:42:57	8.2	2.06	21	11	4.6E-08	0.976	4.5E-08	
	2-13-08	4:10:55	0:46:04	8.1	2.06	21	11	4.6E-08	0.976	4.5E-08	

**HYDRAULIC CONDUCTIVITY (k)      4.6E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-10</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.965	7.531	2.944	7.478
Sample Diameter	2.861	7.267	2.861	7.267
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 133.9    DW= 108.6	23.3	WW= 248.4    DW= 200.9	23.6
Sample Wet Weight (grams)	630.4		632.4	
Wet Density (pcf)	126.0		127.3	
Dry Density (pcf)	102.2		103.0	
Saturation (%)	ASSUMED SG= 2.7 97		100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**(PERMOMETER)**

Confining Pressure (psi)		85	Influent Pressure (psi)		70	Effluent Pressure (psi)		70		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	3:50:31		9.7	1.58	21	15			
	2-13-08	4:18:44	0:28:13	9.2	1.60	21	14	1.6E-08	0.976	1.5E-08
	2-13-08	4:24:35	0:34:04	9.1	1.61	21	14	1.6E-08	0.976	1.5E-08
	2-13-08	4:30:54	0:40:23	9.0	1.61	21	14	1.6E-08	0.976	1.5E-08
	2-13-08	4:37:17	0:46:46	8.9	1.61	21	14	1.6E-08	0.976	1.5E-08

**HYDRAULIC CONDUCTIVITY (k)      1.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-11</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.955	7.506	2.927	7.435
Sample Diameter	2.859	7.262	2.848	7.234
Length/Diameter Ratio	1.03			
Moisture Content (%)	WW= 130.3    DW= 106.8	22.0	WW= 220.7    DW= 178.8	23.4
Sample Wet Weight (grams)	617.3		618.0	
Wet Density (pcf)	124.0		126.3	
Dry Density (pcf)	101.6		102.3	
Saturation (%)	ASSUMED SG= 2.7	90	98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**(PERMOMETER)**

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-13-08	12:51:08		10.1	1.98	21	15				
	2-13-08	13:21:23	0:30:15	9.6	2.00	21	14	1.5E-08	0.976	1.4E-08	
	2-13-08	13:27:42	0:36:34	9.5	2.01	21	14	1.5E-08	0.976	1.4E-08	
	2-13-08	13:34:05	0:42:57	9.4	2.01	21	14	1.5E-08	0.976	1.4E-08	
	2-13-08	13:40:58	0:49:50	9.3	2.01	21	14	1.5E-08	0.976	1.4E-08	

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>1.4E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-12</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.950	7.493	2.924	7.427
Sample Diameter	2.858	7.259	2.852	7.244
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 178.8    DW= 143.7	24.4	WW= 247.7    DW= 202.1	22.6
Sample Wet Weight (grams)	615.5		616.5	
Wet Density (pcf)	123.9		125.7	
Dry Density (pcf)	99.6		102.6	
Saturation (%)	ASSUMED SG= 2.7    95		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
85		70		70						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-13-08	12:51:52		9.7	1.58	21	15			
	2-13-08	13:32:15	0:40:23	9.1	1.61	21	14	1.3E-08	0.976	1.3E-08
	2-13-08	13:38:56	0:47:04	9.0	1.61	21	14	1.3E-08	0.976	1.3E-08
	2-13-08	13:46:25	0:54:33	8.9	1.61	21	14	1.3E-08	0.976	1.3E-08
	2-13-08	13:55:18	1:03:26	8.8	1.62	21	13	1.3E-08	0.976	1.3E-08

**HYDRAULIC CONDUCTIVITY (k)      1.3E-08      cm/sec**



## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-3-13</u>	SAMPLE LOCATION: <u>LINER LIFT 3</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.982	7.574	2.986	7.584
Sample Diameter	2.856	7.254	2.854	7.249
Length/Diameter Ratio	1.04			
Moisture Content (%)	WW= 132.5    DW= 108.1	22.6	WW= 276.8    DW= 227.7	21.6
Sample Wet Weight (grams)	636.5		641.0	
Wet Density (pcf)	126.9		127.8	
Dry Density (pcf)	103.6		105.2	
Saturation (%)	97		97	
	<small>ASSUMED SG= 2.7</small>			

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT (PERMOMETER)

Confining Pressure (psi)		85		Influent Pressure (psi)		70		Effluent Pressure (psi)		70	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-14-08	2:00:28		9.7	1.58	21	15				
	2-14-08	2:16:48	0:16:20	8.8	1.62	21	13	5.1E-08	0.976	5.0E-08	
	2-14-08	2:18:50	0:18:22	8.7	1.62	21	13	5.1E-08	0.976	5.0E-08	
	2-14-08	2:20:55	0:20:27	8.6	1.63	21	13	5.1E-08	0.976	4.9E-08	
	2-14-08	2:23:02	0:22:34	8.5	1.63	21	13	5.0E-08	0.976	4.9E-08	

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>4.9E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-14</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.975	7.557	2.975	7.557
Sample Diameter	2.853	7.247	2.848	7.234
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 131.5    DW= 107.8	22.0	WW= 245.4    DW= 198.2	23.8
Sample Wet Weight (grams)	626.1		629.9	
Wet Density (pcf)	125.4		126.6	
Dry Density (pcf)	102.8		102.3	
Saturation (%)	ASSUMED SG= 2.7    93		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	1:22:08		9.7	1.58	22	15				
	2-20-08	1:42:18	0:20:10	8.9	1.61	22	13	3.6E-08	0.953	3.5E-08	
	2-20-08	1:45:20	0:23:12	8.8	1.62	22	13	3.6E-08	0.953	3.4E-08	
	2-20-08	1:47:49	0:25:41	8.7	1.62	22	13	3.6E-08	0.953	3.5E-08	
	2-20-08	1:50:43	0:28:35	8.6	1.63	22	13	3.6E-08	0.953	3.4E-08	

**HYDRAULIC CONDUCTIVITY (k)    3.4E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-4-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.986	7.584	2.941	7.470
Sample Diameter	2.871	7.292	2.855	7.252
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 109.3    DW= 88.6	23.4	WW= 237.2    DW= 191.0	24.2
Sample Wet Weight (grams)	613.2		612.3	
Wet Density (pcf)	120.8		123.9	
Dry Density (pcf)	98.0		99.8	
Saturation (%)	ASSUMED SG= 2.7    88		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
(PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-5-08	3:02:47		9.8	1.58	22	15				
	3-5-08	3:17:23	0:14:36	9.0	1.61	22	14	4.9E-08	0.953	4.7E-08	
	3-5-08	3:19:21	0:16:34	8.9	1.61	22	13	4.9E-08	0.953	4.7E-08	
	3-5-08	3:21:29	0:18:42	8.8	1.62	22	13	4.9E-08	0.953	4.6E-08	
	3-5-08	3:23:41	0:20:54	8.7	1.62	22	13	4.8E-08	0.953	4.6E-08	

**HYDRAULIC CONDUCTIVITY (k)    4.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-3-16</u>	SAMPLE LOCATION:	<u>LINER LIFT 3</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.919	7.414
Sample Diameter	2.851	7.242	2.856	7.254
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 138.0    DW= 109.3	26.3	WW= 213.3    DW= 168.4	26.7
Sample Wet Weight (grams)	596.5		601.4	
Wet Density (pcf)	121.3		122.5	
Dry Density (pcf)	96.1		96.7	
Saturation (%)	ASSUMED SG= 2.7    94		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-18-08	3:31:54		10.0	1.98	22	15				
	3-18-08	3:53:35	0:21:41	9.3	2.01	22	14	2.9E-08	0.953	2.8E-08	
	3-18-08	3:56:41	0:24:47	9.2	2.02	22	13	3.0E-08	0.953	2.8E-08	
	3-18-08	4:00:13	0:28:19	9.1	2.02	22	13	2.9E-08	0.953	2.8E-08	
	3-18-08	4:03:56	0:32:02	9.0	2.03	22	13	2.9E-08	0.953	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>(TP)LP-4-1</u>	SAMPLE LOCATION: <u>TEST PAD LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.937	7.460	2.909	7.389
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 138.5    DW= 112.4	23.2	WW= 235.5    DW= 191.7	22.8
Sample Wet Weight (grams)	616.3		616.5	
Wet Density (pcf)	124.5		126.3	
Dry Density (pcf)	101.1		102.8	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-6-08	2:59:03		10.0	1.98	21	15				
	2-6-08	3:24:35	0:25:32	9.2	2.02	21	13	2.9E-08	0.976	2.8E-08	
	2-6-08	3:27:48	0:28:45	9.1	2.02	21	13	2.9E-08	0.976	2.8E-08	
	2-6-08	3:31:05	0:32:02	9.0	2.03	21	13	2.9E-08	0.976	2.8E-08	
	2-6-08	3:34:28	0:35:25	8.9	2.03	21	13	2.9E-08	0.976	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.8E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-2</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.940	7.468	2.912	7.396
Sample Diameter	2.861	7.267	2.852	7.244
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 130.5    DW= 105.4	23.8	WW= 204.9    DW= 165.5	23.8
Sample Wet Weight (grams)	614.7		616.5	
Wet Density (pcf)	123.9		126.2	
Dry Density (pcf)	100.1		102.0	
Saturation (%)	94		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)    75		Influent Pressure (psi)    60		Effluent Pressure (psi)    60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	3:43:16		9.6	1.58	21	15			
	2-6-08	4:06:37	0:23:21	8.4	1.63	21	13	4.8E-08	0.976	4.7E-08
	2-6-08	4:08:53	0:25:37	8.3	1.64	21	12	4.8E-08	0.976	4.7E-08
	2-6-08	4:11:19	0:28:03	8.2	1.64	21	12	4.8E-08	0.976	4.7E-08
	2-6-08	4:13:36	0:30:20	8.1	1.65	21	12	4.8E-08	0.976	4.7E-08

<b>HYDRAULIC CONDUCTIVITY (k)</b>	<b>4.7E-08</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-3</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FI. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	3.011	7.648	2.912	7.396
Sample Diameter	2.859	7.262	2.852	7.244
Length/Diameter Ratio	1.05			
Moisture Content (%)	WW= 160.5    DW= 131.0	22.5	WW= 221.9    DW= 180.4	23.0
Sample Wet Weight (grams)	636.7		636.7	
Wet Density (pcf)	125.5		130.4	
Dry Density (pcf)	102.4		106.0	
Saturation (%)	ASSUMED SG= 2.7	94	105	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	3:40:10		10.2	1.98	21	15			
	2-6-08	3:57:38	0:17:28	9.5	2.01	21	14	3.6E-08	0.976	3.6E-08
	2-6-08	4:00:15	0:20:05	9.4	2.01	21	13	3.6E-08	0.976	3.6E-08
	2-6-08	4:03:02	0:22:52	9.3	2.01	21	13	3.6E-08	0.976	3.5E-08
	2-6-08	4:05:58	0:25:48	9.2	2.02	21	13	3.6E-08	0.976	3.5E-08

**HYDRAULIC CONDUCTIVITY (k)      3.5E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-4</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.939	7.465	2.891	7.343
Sample Diameter	2.861	7.267	2.857	7.257
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 144.4    DW= 118.6	21.8	WW= 191.9    DW= 156.1	22.9
Sample Wet Weight (grams)	619.8		615.7	
Wet Density (pcf)	125.0		126.6	
Dry Density (pcf)	102.6		102.9	
Saturation (%)	ASSUMED SG= 2.7    92		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-6-08	9:57:40		9.6	1.58	21	15				
	2-6-08	10:21:13	0:23:33	9.0	1.61	21	14	2.3E-08	0.976	2.2E-08	
	2-6-08	10:25:34	0:27:54	8.9	1.61	21	14	2.3E-08	0.976	2.2E-08	
	2-6-08	10:30:06	0:32:26	8.8	1.62	21	13	2.3E-08	0.976	2.2E-08	
	2-6-08	10:34:51	0:37:11	8.7	1.62	21	13	2.2E-08	0.976	2.2E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.2E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-5-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-5</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.980	7.569	2.915	7.404
Sample Diameter	2.855	7.252	2.847	7.231
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 165.7    DW= 133.3	24.3	WW= 203.0    DW= 164.9	23.1
Sample Wet Weight (grams)	622.5		620.6	
Wet Density (pcf)	124.3		127.4	
Dry Density (pcf)	100.0		103.5	
Saturation (%)	ASSUMED SG= 2.7 96		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-6-08	9:57:04		10.1	1.98	21	15			
	2-6-08	10:18:56	0:21:52	9.5	2.01	21	14	2.5E-08	0.976	2.4E-08
	2-6-08	10:22:39	0:25:35	9.4	2.01	21	14	2.5E-08	0.976	2.4E-08
	2-6-08	10:26:35	0:29:31	9.3	2.01	21	13	2.5E-08	0.976	2.4E-08
	2-6-08	10:30:47	0:33:43	9.2	2.02	21	13	2.5E-08	0.976	2.4E-08

**HYDRAULIC CONDUCTIVITY (k)      2.4E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-6</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.939	7.465	2.900	7.366
Sample Diameter	2.870	7.290	2.858	7.259
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 133.8    DW= 107.8	24.1	WW= 257.0    DW= 207.0	24.2
Sample Wet Weight (grams)	608.9		604.5	
Wet Density (pcf)	122.0		123.8	
Dry Density (pcf)	98.3		99.7	
Saturation (%) <small>ASSUMED SG= 2.7</small>	91		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		Influent Pressure (psi)		Effluent Pressure (psi)						
75		60		60						
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-20-08	1:24:12		10.0	1.98	22	15			
	2-20-08	1:44:26	0:20:14	8.9	2.03	22	13	5.1E-08	0.953	4.8E-08
	2-20-08	1:46:41	0:22:29	8.8	2.03	22	13	5.0E-08	0.953	4.8E-08
	2-20-08	1:48:57	0:24:45	8.7	2.04	22	12	5.0E-08	0.953	4.7E-08
	2-20-08	1:51:22	0:27:10	8.6	2.04	22	12	4.9E-08	0.953	4.7E-08

**HYDRAULIC CONDUCTIVITY (k)    4.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT VOLUME APPARATUS (ASTM D 5084)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-7</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.947	7.485	2.861	7.267
Sample Diameter	2.869	7.287	2.854	7.249
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 126.6    DW= 100.1	26.5	WW= 243.6    DW= 193.4	26.0
Sample Wet Weight (grams)	600.3		596.3	
Wet Density (pcf)	120.0		124.1	
Dry Density (pcf)	94.9		98.5	
Saturation (%)	ASSUMED SG= 2.7    92		99	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**(PERMOMETER)**

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:06:56		9.6	1.58	22	15				
	2-20-08	2:28:34	0:21:38	8.9	1.61	22	14	2.9E-08	0.953	2.8E-08	
	2-20-08	2:31:51	0:24:55	8.8	1.62	22	13	2.9E-08	0.953	2.8E-08	
	2-20-08	2:35:19	0:28:23	8.7	1.62	22	13	2.9E-08	0.953	2.8E-08	
	2-20-08	2:38:52	0:31:56	8.6	1.63	22	13	2.9E-08	0.953	2.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.8E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-8</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.925	7.430	2.840	7.214
Sample Diameter	2.860	7.264	2.846	7.229
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 146.9    DW= 115.1	27.6	WW= 253.2    DW= 201.4	25.7
Sample Wet Weight (grams)	590.3		583.9	
Wet Density (pcf)	119.7		123.1	
Dry Density (pcf)	93.8		97.9	
Saturation (%)	ASSUMED SG= 2.7    94		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:09:46		10.0	1.98	22	15				
	2-20-08	2:42:29	0:32:43	9.0	2.03	22	13	2.8E-08	0.953	2.7E-08	
	2-20-08	2:45:06	0:35:20	8.9	2.03	22	13	2.9E-08	0.953	2.8E-08	
	2-20-08	2:48:53	0:39:07	8.8	2.03	22	13	2.9E-08	0.953	2.7E-08	
	2-20-08	2:52:45	0:42:59	8.7	2.04	22	13	2.9E-08	0.953	2.7E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.7E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-9</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.854	7.249
Sample Diameter	2.858	7.259	2.847	7.231
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 133.5    DW= 105.1	27.0	WW= 197.9    DW= 157.5	25.7
Sample Wet Weight (grams)	585.2		580.0	
Wet Density (pcf)	118.4		121.6	
Dry Density (pcf)	93.2		96.8	
Saturation (%) <small>ASSUMED SG= 2.7</small>	90		93	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:46:01		9.6	1.58	22	15				
	2-20-08	3:11:28	0:25:27	9.0	1.61	22	14	2.1E-08	0.953	2.0E-08	
	2-20-08	3:15:58	0:29:57	8.9	1.61	22	14	2.1E-08	0.953	2.0E-08	
	2-20-08	3:21:06	0:35:05	8.8	1.62	22	13	2.1E-08	0.953	2.0E-08	
	2-20-08	3:26:33	0:40:32	8.7	1.62	22	13	2.0E-08	0.953	2.0E-08	

**HYDRAULIC CONDUCTIVITY (k)      2.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-10</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.940	7.468	2.869	7.287
Sample Diameter	2.863	7.272	2.848	7.234
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 136.9    DW= 108.7	25.9	WW= 205.9    DW= 159.7	28.9
Sample Wet Weight (grams)	590.7		586.3	
Wet Density (pcf)	118.9		122.2	
Dry Density (pcf)	94.4		94.8	
Saturation (%)	ASSUMED SG= 2.7    89		100	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	2:58:29		10.0	1.98	22	15				
	2-20-08	3:19:17	0:20:48	9.0	2.03	22	13	4.5E-08	0.953	4.3E-08	
	2-20-08	3:21:25	0:22:56	8.9	2.03	22	13	4.5E-08	0.953	4.3E-08	
	2-20-08	3:23:42	0:25:13	8.8	2.03	22	13	4.5E-08	0.953	4.3E-08	
	2-20-08	3:26:09	0:27:40	8.7	2.04	22	12	4.5E-08	0.953	4.2E-08	

**HYDRAULIC CONDUCTIVITY (k)    4.3E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-11</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.898	7.361	2.830	7.188
Sample Diameter	2.859	7.262	2.849	7.236
Length/Diameter Ratio		1.01		
Moisture Content (%)	WW= 108.6    DW= 88.5	22.7	WW= 213.3    DW= 173.0	23.3
Sample Wet Weight (grams)	595.7		592.5	
Wet Density (pcf)	122.0		125.1	
Dry Density (pcf)	99.4		101.5	
Saturation (%)	ASSUMED SG= 2.7    88		95	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75	Influent Pressure (psi)		60	Effluent Pressure (psi)		60		
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-20-08	3:32:30		9.5	1.59	22	15			
	2-20-08	3:47:23	0:14:53	8.8	1.62	22	14	4.3E-08	0.953	4.1E-08
	2-20-08	3:49:45	0:17:15	8.7	1.62	22	13	4.2E-08	0.953	4.1E-08
	2-20-08	3:52:11	0:19:41	8.6	1.63	22	13	4.2E-08	0.953	4.0E-08
	2-20-08	3:54:37	0:22:07	8.5	1.63	22	13	4.2E-08	0.953	4.0E-08

**HYDRAULIC CONDUCTIVITY (k)      4.0E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-12</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.870	7.290
Sample Diameter	2.859	7.262	2.846	7.229
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 153.9 DW= 124.4	23.7	WW= 228.3 DW= 180.3	26.6
Sample Wet Weight (grams)	594.3		589.5	
Wet Density (pcf)	120.2		123.0	
Dry Density (pcf)	97.2		97.1	
Saturation (%) <small>ASSUMED SG= 2.7</small>	87		98	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi) <u>75</u>		Influent Pressure (psi) <u>60</u>				Effluent Pressure (psi) <u>60</u>				
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
Y	2-20-08	3:32:54		10.0	1.98	22	15			
	2-20-08	3:48:15	0:15:21	9.3	2.01	22	14	4.1E-08	0.953	3.9E-08
	2-20-08	3:50:36	0:17:42	9.2	2.02	22	13	4.1E-08	0.953	3.9E-08
	2-20-08	3:52:58	0:20:04	9.1	2.02	22	13	4.1E-08	0.953	3.9E-08
	2-20-08	3:55:27	0:22:33	9.0	2.03	22	13	4.1E-08	0.953	3.9E-08

**HYDRAULIC CONDUCTIVITY (k) 3.9E-08 cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-13</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.976	7.559	2.937	7.460
Sample Diameter	2.857	7.257	2.856	7.254
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 121.1    DW= 97.3	24.5	WW= 246.4    DW= 197.0	25.1
Sample Wet Weight (grams)	616.4		612.9	
Wet Density (pcf)	123.1		124.1	
Dry Density (pcf)	98.9		99.2	
Saturation (%) <small>ASSUMED SG= 2.7</small>	94		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	4:02:33		10.1	1.98	22	15				
	2-20-08	4:22:30	0:19:57	9.5	2.01	22	14	2.7E-08	0.953	2.6E-08	
	2-20-08	4:25:46	0:23:13	9.4	2.01	22	14	2.7E-08	0.953	2.6E-08	
	2-20-08	4:29:12	0:26:39	9.3	2.01	22	13	2.8E-08	0.953	2.6E-08	
	2-20-08	4:33:05	0:30:32	9.2	2.02	22	13	2.7E-08	0.953	2.6E-08	

**HYDRAULIC CONDUCTIVITY (k)    2.6E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-14</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.977	7.562	2.920	7.417
Sample Diameter	2.859	7.262	2.853	7.247
Length/Diameter Ratio		1.04		
Moisture Content (%)	WW= 122.0    DW= 99.3	22.9	WW= 234.3    DW= 191.7	22.2
Sample Wet Weight (grams)	615.6		610.9	
Wet Density (pcf)	122.7		124.7	
Dry Density (pcf)	99.9		102.0	
Saturation (%)	ASSUMED SG= 2.7    90		92	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	2-20-08	4:03:00		9.7	1.58	22	15				
	2-20-08	4:25:16	0:22:16	9.2	1.60	22	14	2.0E-08	0.953	1.9E-08	
	2-20-08	4:30:22	0:27:22	9.1	1.61	22	14	2.0E-08	0.953	1.9E-08	
	2-20-08	4:35:54	0:32:54	9.0	1.61	22	14	1.9E-08	0.953	1.8E-08	
	2-20-08	4:41:26	0:38:26	8.9	1.61	22	13	1.9E-08	0.953	1.8E-08	

**HYDRAULIC CONDUCTIVITY (k)    1.9E-08    cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-19-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>LP-4-15</u>	SAMPLE LOCATION:	<u>LINER LIFT 4</u>
TYPE	<u>UNDISTURBED</u>	SAMPLE DESCRIPTION:	<u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.934	7.452	2.928	7.437
Sample Diameter	2.850	7.239	2.850	7.239
Length/Diameter Ratio		1.03		
Moisture Content (%)	WW= 150.8    DW= 120.0	25.7	WW= 210.1    DW= 167.1	25.7
Sample Wet Weight (grams)	605.8		602.4	
Wet Density (pcf)	123.3		122.9	
Dry Density (pcf)	98.1		97.7	
Saturation (%)	ASSUMED SG= 2.7    97		96	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-18-08	3:31:53		9.6	1.58	22	15				
	3-18-08	3:55:10	0:23:17	9.1	1.61	22	14	1.9E-08	0.953	1.8E-08	
	3-18-08	4:00:39	0:28:46	9.0	1.61	22	14	1.9E-08	0.953	1.8E-08	
	3-18-08	4:06:08	0:34:15	8.9	1.61	22	14	1.9E-08	0.953	1.8E-08	
	3-18-08	4:12:47	0:40:54	8.8	1.62	22	13	1.8E-08	0.953	1.7E-08	

**HYDRAULIC CONDUCTIVITY (k)      1.8E-08      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT VOLUME APPARATUS (ASTM D 5084)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-4-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>LP-4-16</u>	SAMPLE LOCATION: <u>LINER LIFT 4</u>
TYPE <u>UNDISTURBED</u>	SAMPLE DESCRIPTION: <u>GREY &amp; BROWN FL. SANDY CLAY</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	INITIAL		FINAL	
	inches	centimeters	inches	centimeters
Sample Length	2.927	7.435	2.887	7.333
Sample Diameter	2.859	7.262	2.850	7.239
Length/Diameter Ratio		1.02		
Moisture Content (%)	WW= 167.6    DW= 136.3	23.0	WW= 218.8    DW= 180.3	21.4
Sample Wet Weight (grams)	621.4		619.9	
Wet Density (pcf)	126.0		128.2	
Dry Density (pcf)	102.5		105.7	
Saturation (%)	ASSUMED SG= 2.7    96		97	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 (PERMOMETER)

Confining Pressure (psi)		75		Influent Pressure (psi)		60		Effluent Pressure (psi)		60	
Reset (Y/N)	Date	Clock Time	Elapsed Time	HA <sub>OUT</sub> (cm)	HA <sub>IN</sub> (cm)	Temp °C	Gradient	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)	
Y	3-5-08	3:07:01		10.0	1.98	22	15				
	3-5-08	3:23:15	0:16:14	9.4	2.01	22	14	3.3E-08	0.953	3.2E-08	
	3-5-08	3:26:08	0:19:07	9.3	2.01	22	14	3.3E-08	0.953	3.2E-08	
	3-5-08	3:29:13	0:22:12	9.2	2.02	22	13	3.3E-08	0.953	3.1E-08	
	3-5-08	3:32:29	0:25:28	9.1	2.02	22	13	3.2E-08	0.953	3.1E-08	

**HYDRAULIC CONDUCTIVITY (k)    3.1E-08    cm/sec**

**SUMMARY OF TEST RESULTS**  
**NATIVE SOIL PROTECTIVE COVER**

**SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS  
NATIVE PROTECTIVE COVER SAND**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 [667,000 sq ft ( 15.3 Acres)]: 42,100 cy native protective cover sand

SAMPLE NO.	MATERIAL DESCRIPTION	HYDRAULIC CONDUCTIVITY (ASTM D 2434)  (Dense) cm/s
PCBW-1-C12	Yellow & brown fi.-med. SAND	4.6E-03
PCBW-2-C12	Yellow & brown fi.-med. SAND	7.9E-03
PCBW-3-C12	Yellow & brown fi.-med. SAND	1.3E-02
PCBW-4-C12	Yellow & brown fi.-med. SAND	2.6E-03
PCBW-5-C12	Yellow & brown fi.-med. SAND	1.5E-02
PCBW-6-C12	Yellow & brown fi.-med. SAND	7.8E-03
PCBW-7-C12	Yellow & brown fi.-med. SAND	8.2E-03
PCBW-8-C12	Yellow & brown fi.-med. SAND	8.0E-03
PCBW-9-C12	Yellow & brown fi.-med. SAND	6.1E-03
PCBW-10-C12	Yellow & brown fi.-med. SAND	9.3 E-03
PCBW-11-C12	Yellow & brown fi.-med. SAND	6.5 E-03
PCBW-12-C12	Yellow & brown fi.-med. SAND	1.3 E-02
PCBW-13-C12	Yellow & brown fi.-med. SAND	2.1 E-03
PCBW-14-C12	Yellow & brown fi.-med. SAND	5.8E-03
PCBW-15-C12	Yellow & brown fi.-med. SAND	4.3E-03

PROJECT REQUIREMENTS:	k ≥ 1 E-03 cm/s
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-1</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.0	DW= 96.0	14.6
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1350		
Unused Wet Weight, W <sub>2</sub> (grams)	101.6		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1248.4		
Wet Density (pcf)	117.8		
Dry Density (pcf)	102.8		
Void Ratio, e	ASSUMED SG= 2.70	0.64	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
1-27-08	1	120	55.9	44.2	11.7	34	14	4.0E-03	1.165	4.7E-03
1-27-08	2	60	46.0	19.9	26.1	37	14	3.9E-03	1.165	4.6E-03
1-27-08	3	60	39.0	2.1	36.9	53	14	4.0E-03	1.165	4.6E-03

**HYDRAULIC CONDUCTIVITY                      4.6E-03                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-2</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 150.0	DW= 132.4	13.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)		1300	
Unused Wet Weight, W <sub>2</sub> (grams)		63.8	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1236.2	
Wet Density (pcf)		116.6	
Dry Density (pcf)		102.9	
Void Ratio, e	ASSUMED SG= 2.70	0.64	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-6-08	1	70	59.2	43.7	15.5	44	14	6.7E-03	1.165	7.9E-03
2-6-08	2	60	50.6	17.3	33.3	81	14	6.7E-03	1.165	7.9E-03
2-6-08	3	60	50.0	13.0	37.0	90	14	6.7E-03	1.165	7.9E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>7.9E-03</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-8-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-3</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL.-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches	centimeters
	Sample Length Between Manometer Outlets	3.000
Sample Diameter	3.006	7.635
Moisture Content (%)	WW= 121.3      DW= 110.3	10.0
Height, H <sub>1</sub>	6.126	15.560
Height, H <sub>2</sub>	0.437	1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689	14.450
Wet Weight, W <sub>1</sub> (grams)	1200	
Unused Wet Weight, W <sub>2</sub> (grams)	115.6	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1084.4	
Wet Density (pcf)	102.3	
Dry Density (pcf)	93.0	
Void Ratio, e	0.81	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-9-08	1	60	61.2	53.7	7.5	33	16	1.2E-02	1.106	1.3E-02
4-9-08	2	60	52.2	32.8	19.4	85	16	1.2E-02	1.106	1.3E-02
4-9-08	3	48	45.7	18.0	27.7	95	16	1.2E-02	1.106	1.3E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>1.3E-02</b>	<b>cm/sec</b>
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-8-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-4</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 118.0	DW= 105.2	12.2
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1250		
Unused Wet Weight, W <sub>2</sub> (grams)	92.7		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1157.3		
Wet Density (pcf)	109.2		
Dry Density (pcf)	97.3		
Void Ratio, e	ASSUMED SG= 2.70	0.73	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-9-08	1	120	57.9	46.0	11.9	20	16	2.3E-03	1.106	2.6E-03
4-9-08	2	60	51.5	22.1	29.4	25	16	2.4E-03	1.106	2.6E-03
4-9-08	3	60	47.1	4.9	42.2	36	16	2.4E-03	1.106	2.6E-03

**HYDRAULIC CONDUCTIVITY                      2.6E-03                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-5</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL.-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 148.8	DW= 135.0	10.2
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.433		1.100
Height, H <sub>1</sub> -H <sub>2</sub>	5.693		14.460
Wet Weight, W <sub>1</sub> (grams)	1300		
Unused Wet Weight, W <sub>2</sub> (grams)	182.2		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1117.8		
Wet Density (pcf)	105.4		
Dry Density (pcf)	95.6		
Void Ratio, e	ASSUMED SG= 2.70		0.76

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-15-08	1	60	56.9	46.3	10.6	52	16	1.4E-02	1.106	1.5E-02
4-15-08	2	45	44.7	21.7	23.0	84	16	1.4E-02	1.106	1.5E-02
4-15-08	3	30	37.3	5.8	31.5	75	16	1.3E-02	1.106	1.5E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>1.5E-02</b>	<b>cm/sec</b>
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-6</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM			
			inches
			centimeters
Sample Length Between Manometer Outlets			3.000
Sample Diameter			3.006
Moisture Content (%)	WW= 127.7	DW= 114.3	11.7
Height, H <sub>1</sub>			6.126
Height, H <sub>2</sub>			0.437
Height, H <sub>1</sub> -H <sub>2</sub>			5.689
Wet Weight, W <sub>1</sub> (grams)			1250
Unused Wet Weight, W <sub>2</sub> (grams)			181.3
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)			1068.7
Wet Density (pcf)			100.8
Dry Density (pcf)			90.2
Void Ratio, e	ASSUMED SG= 2.70		0.87

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-15-08	1	60	61.6	52.5	9.1	23	16	7.0E-03	1.106	7.8E-03
4-15-08	2	60	52.9	30.8	22.1	56	16	7.0E-03	1.106	7.8E-03
4-15-08	3	60	47.8	17.5	30.3	77	16	7.0E-03	1.106	7.8E-03

**HYDRAULIC CONDUCTIVITY                      7.8E-03                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

### EAST CAROLINA

PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-7</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches	centimeters
Sample Length Between Manometer Outlets	3.000	7.620
Sample Diameter	3.006	7.635
Moisture Content (%)	WW= 110.0      DW= 98.9	11.2
Height, H <sub>1</sub>	6.126	15.560
Height, H <sub>2</sub>	0.437	1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689	14.450
Wet Weight, W <sub>1</sub> (grams)	1300	
Unused Wet Weight, W <sub>2</sub> (grams)	173.9	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1126.1	
Wet Density (pcf)	106.2	
Dry Density (pcf)	95.5	
Void Ratio, e	0.76	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-15-08	1	60	60.7	52.5	8.2	22	16	7.4E-03	1.106	8.2E-03
4-15-08	2	60	48.8	24.5	24.3	65	16	7.4E-03	1.106	8.2E-03
4-15-08	3	60	43.2	10.5	32.7	86	16	7.3E-03	1.106	8.1E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>8.2E-03</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 4-10-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-8</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 136.2	DW= 124.5	9.4
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1299.8		
Unused Wet Weight, W <sub>2</sub> (grams)	184.7		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1115.1		
Wet Density (pcf)	105.2		
Dry Density (pcf)	96.1		
Void Ratio, e	0.75		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-17-08	1	60	57.9	45.8	12.1	32	16	7.3E-03	1.106	8.1E-03
4-17-08	2	60	46.8	19.1	27.7	72	16	7.2E-03	1.106	8.0E-03
4-17-08	3	60	40.4	2.6	37.8	98	16	7.2E-03	1.106	8.0E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>8.0E-03</b>	<b>cm/sec</b>
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BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-9</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 100.0	DW= 91.8	8.9
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1300		
Unused Wet Weight, W <sub>2</sub> (grams)	161.3		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1138.7		
Wet Density (pcf)	107.4		
Dry Density (pcf)	98.6		
Void Ratio, e	ASSUMED SG= 2.70	0.71	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-21-08	1	60	57.7	47.1	10.6	22	17	5.8E-03	1.077	6.2E-03
4-21-08	2	60	46.9	22.0	24.9	51	17	5.7E-03	1.077	6.1E-03
4-21-08	3	60	39.5	5.2	34.3	70	17	5.7E-03	1.077	6.1E-03

**HYDRAULIC CONDUCTIVITY                      6.1E-03                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-10</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FI.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 100.0	DW= 93.0	7.5
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1300		
Unused Wet Weight, W <sub>2</sub> (grams)	145.1		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1154.9		
Wet Density (pcf)	108.9		
Dry Density (pcf)	101.3		
Void Ratio, e	ASSUMED SG= 2.70		0.66

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-21-08	1	60	52.4	44.6	7.8	24	17	8.5E-03	1.077	9.2E-03
4-21-08	2	60	34.4	15.8	18.6	58	17	8.6E-03	1.077	9.3E-03
4-21-08	3	60	27.0	3.3	23.7	74	17	8.7E-03	1.077	9.3E-03

**HYDRAULIC CONDUCTIVITY                      9.3E-03                      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT HEAD METHOD (ASTM D 2434)**

**EAST CAROLINA**  
 PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-11</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 146.0	DW= 132.2	10.4
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1298.7		
Unused Wet Weight, W <sub>2</sub> (grams)	108		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1190.7		
Wet Density (pcf)	112.3		
Dry Density (pcf)	101.7		
Void Ratio, e	ASSUMED SG= 2.70		0.66

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-22-08	1	60	56.7	49.4	7.3	16	17	6.1E-03	1.077	6.5E-03
4-22-08	2	60	44.1	26.7	17.4	38	17	6.1E-03	1.077	6.5E-03
4-22-08	3	60	34.4	8.4	26.0	56	17	6.0E-03	1.077	6.4E-03

**HYDRAULIC CONDUCTIVITY      6.5E-03      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-12</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FI-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 123.3	DW= 111.0	11.1
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)		1227.8	
Unused Wet Weight, W <sub>2</sub> (grams)		95.7	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1132.1	
Wet Density (pcf)		106.8	
Dry Density (pcf)		96.1	
Void Ratio, e	ASSUMED SG= 2.70	0.75	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-22-08	1	60	55.4	45.4	10.0	45	17	1.2E-02	1.077	1.3E-02
4-22-08	2	60	44.3	22.8	21.5	92	17	1.2E-02	1.077	1.3E-02
4-22-08	3	40	37.2	6.8	30.4	83	17	1.1E-02	1.077	1.2E-02

**HYDRAULIC CONDUCTIVITY                      1.3E-02                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCBW-13</u>	SAMPLE LOCATION:	<u>TRIPP PROPERTY BORROW AREA</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>YELLOW &amp; BROWN FL.-MED. SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 202.0	DW= 183.1	10.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.531		1.350
Height, H <sub>1</sub> -H <sub>2</sub>	5.595		14.210
Wet Weight, W <sub>1</sub> (grams)		1537.5	
Unused Wet Weight, W <sub>2</sub> (grams)		299.8	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1237.7	
Wet Density (pcf)		118.7	
Dry Density (pcf)		107.6	
Void Ratio, e	ASSUMED SG= 2.70	0.57	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
5-1-08	1	120	60.0	51.5	8.5	12	17	2.0E-03	1.077	2.1E-03
5-1-08	2	120	59.8	50.4	9.4	14	17	2.1E-03	1.077	2.2E-03
5-1-08	3	120	59.5	48.8	10.7	15	17	1.9E-03	1.077	2.1E-03

**HYDRAULIC CONDUCTIVITY                      2.1E-03                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

### EAST CAROLINA

PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-14</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 123.9	DW= 113.1	9.5
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1299.3		
Unused Wet Weight, W <sub>2</sub> (grams)	135		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1164.3		
Wet Density (pcf)	109.8		
Dry Density (pcf)	100.2		
Void Ratio, e	ASSUMED SG= 2.70		0.68

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-23-08	1	60	54.6	44.4	10.2	21	17	5.7E-03	1.077	6.2E-03
4-23-08	2	60	40.0	16.5	23.5	45	17	5.3E-03	1.077	5.7E-03
4-23-08	3	60	31.3	0.3	31.0	58	17	5.2E-03	1.077	5.6E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>5.8E-03</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

**EAST CAROLINA**  
 PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 4-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCBW-15</u>	SAMPLE LOCATION: <u>TRIPP PROPERTY BORROW AREA</u>
TYPE <u>REMOLDED</u>	SAMPLE DESCRIPTION: <u>YELLOW &amp; BROWN FL-MED. SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 185.1	DW= 167.1	10.8
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.594		1.510
Height, H <sub>1</sub> -H <sub>2</sub>	5.532		14.050
Wet Weight, W <sub>1</sub> (grams)	1935.5		
Unused Wet Weight, W <sub>2</sub> (grams)	814.3		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1121.2		
Wet Density (pcf)	108.8		
Dry Density (pcf)	98.2		
Void Ratio, e	0.72		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
4-30-08	1	60	56.4	35.7	20.7	30	17	4.0E-03	1.077	4.3E-03
4-30-08	2	60	50.7	20.4	30.3	45	17	4.1E-03	1.077	4.4E-03
4-30-08	3	60	48.4	13.9	34.5	49	17	3.9E-03	1.077	4.2E-03

<b>HYDRAULIC CONDUCTIVITY</b>	<b>4.3E-03</b>	<b>cm/sec</b>
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**SUMMARY OF TEST RESULTS**  
**WASHED SAND PROTECTIVE COVER**

**SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS  
WASHED SAND PROTECTIVE COVER**

CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

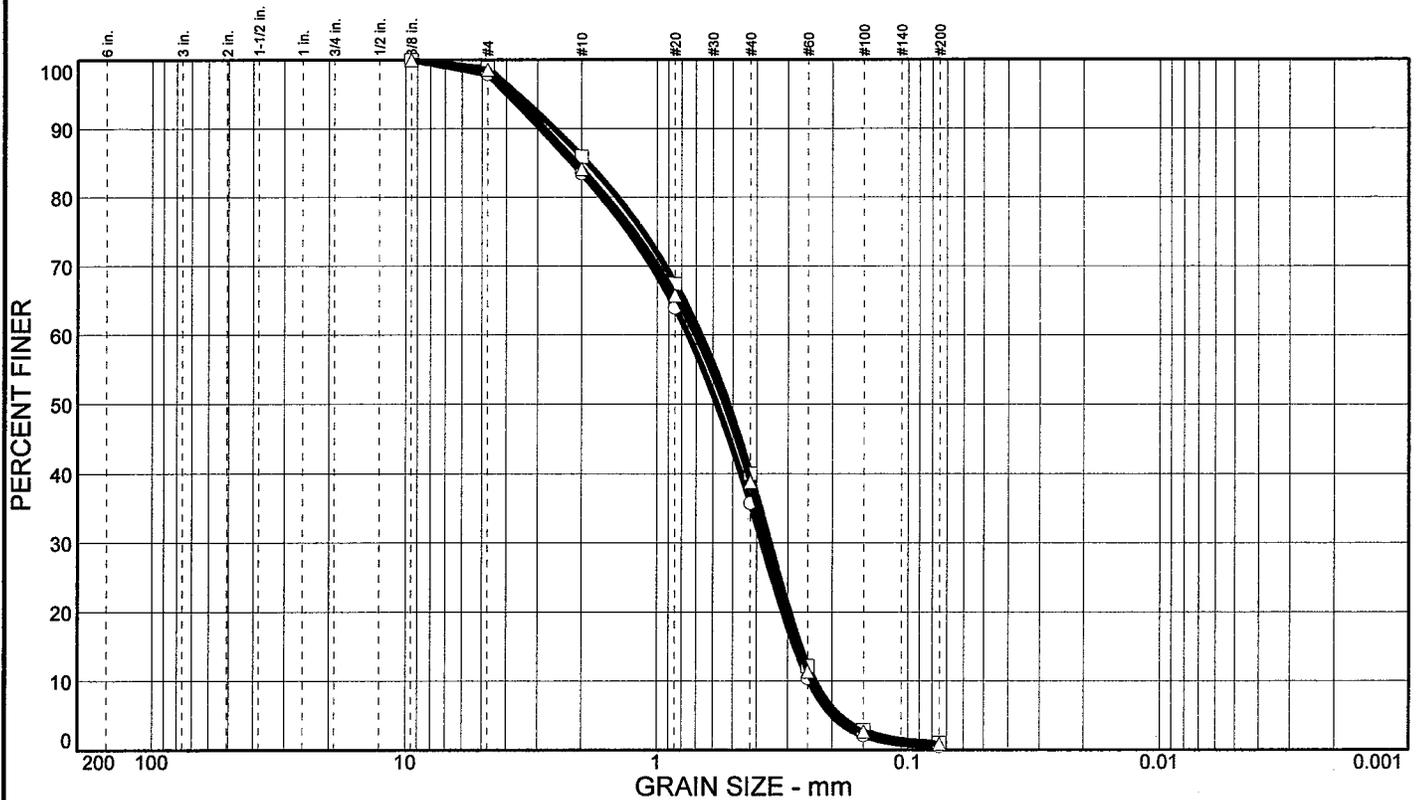
Cell No. 12 [667,000 sq ft ( 15.3 Acres)]: 6,100 cy washed sand protective cover

SAMPLE NO.	MATERIAL DESCRIPTION	HYDRAULIC CONDUCTIVITY (ASTM D 2434)  (Dense)  cm/s	PERCENT FINES (<#200 seive)  %
PCSP-1-C12	Washed Sand	3.3 E-02	0.8
PCSP-2-C12	Washed Sand	2.5 E-02	2.8
PCSP-3-C12	Washed Sand	4.1 E-02	0.7
PCSP-4-C12	Washed Sand	5.1 E-02	0.8
PCSP-5-C12	Washed Sand	2.9E-02	1.0
PCSP-6-C12	Washed Sand	5.6E-02	0.5
PCSP-7-C12	Washed Sand	2.5E-02	1.0
PCSP-8-C12	Washed Sand	3.3E-02	0.9
PCSP-9-C12	Washed Sand	3.6E-02	—

PROJECT REQUIREMENTS:	k ≥ 1 E-02 cm/s	≤ 5%
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# Particle Size Distribution Report



**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT HEAD METHOD (ASTM D 2434)**

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
PROJECT NO.: J07-1001-58  
DATE RECEIVED: 11-19-07

TESTED BY: JOHN MATHEW  
CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-1</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 113.8	DW= 103.5	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)		1300	
Unused Wet Weight, W <sub>2</sub> (grams)		182.2	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)		1117.8	
Wet Density (pcf)		106.6	
Dry Density (pcf)		97.0	
Void Ratio, e	ASSUMED SG= 2.70	0.74	

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
11-21-07	1	40	59.0	48.2	10.8	81	17	3.1E-02	1.077	3.4E-02
11-21-07	2	24	50.8	30.0	20.8	94	17	3.1E-02	1.077	3.4E-02
11-21-07	3	15	45.4	17.6	27.8	76	17	3.0E-02	1.077	3.3E-02

**HYDRAULIC CONDUCTIVITY                      3.3E-02                      cm/sec**

BLE INC.

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 11-21-07

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-2</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 118.4	DW= 107.6	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)	1250.7		
Unused Wet Weight, W <sub>2</sub> (grams)	70.4		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1180.3		
Wet Density (pcf)	112.6		
Dry Density (pcf)	102.3		
Void Ratio, e	ASSUMED SG= 2.70		0.65

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
11-30-07	1	50	59.4	52.4	7.0	48	16	2.3E-02	1.106	2.5E-02
11-30-07	2	40	50.6	35.4	15.2	81	16	2.2E-02	1.106	2.5E-02
11-30-07	3	35	44.2	23.2	21.0	97	16	2.2E-02	1.106	2.4E-02

**HYDRAULIC CONDUCTIVITY                      2.5E-02                      cm/sec**

**HYDRAULIC CONDUCTIVITY TEST REPORT**  
 CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 11-21-07

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-3</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.3	DW= 100.3	10.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)	1329		
Unused Wet Weight, W <sub>2</sub> (grams)	200.7		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1128.3		
Wet Density (pcf)	107.6		
Dry Density (pcf)	97.9		
Void Ratio, e	ASSUMED SG= 2.70		0.72

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
 RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
11-30-07	1	45	58.3	50.0	8.3	84	16	3.7E-02	1.106	4.1E-02
11-30-07	2	20	48.2	30.1	18.1	81	16	3.7E-02	1.106	4.1E-02
11-30-07	3	15	41.6	17.4	24.2	80	16	3.7E-02	1.106	4.1E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>4.1E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-4</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.5	DW= 100.7	9.7
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1270.8		
Unused Wet Weight, W <sub>2</sub> (grams)	75.5		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1195.3		
Wet Density (pcf)	112.7		
Dry Density (pcf)	102.7		
Void Ratio, e	0.64		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-2-08	1	30	58.7	50.8	7.9	63	14	4.4E-02	1.165	5.2E-02
2-2-08	2	20	49.1	31.0	18.1	95	14	4.4E-02	1.165	5.1E-02
2-2-08	3	12	36.7	9.4	27.3	86	14	4.4E-02	1.165	5.1E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>5.1E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-5</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 190.0	DW= 172.3	10.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.500		1.270
Height, H <sub>1</sub> -H <sub>2</sub>	5.626		14.290
Wet Weight, W <sub>1</sub> (grams)	1350		
Unused Wet Weight, W <sub>2</sub> (grams)	175.6		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1174.4		
Wet Density (pcf)	112.0		
Dry Density (pcf)	101.6		
Void Ratio, e	ASSUMED SG= 2.70		0.66

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT

RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
1-27-08	1	60	60.5	53.7	6.8	64	14	2.6E-02	1.165	3.0E-02
1-27-08	2	30	51.2	33.2	18.0	80	14	2.5E-02	1.165	2.9E-02
1-27-08	3	20	45.3	19.9	25.4	75	14	2.5E-02	1.165	2.9E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>2.9E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 1-18-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-6</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 200.0	DW= 179.7	11.3
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.563		1.430
Height, H <sub>1</sub> -H <sub>2</sub>	5.563		14.130
Wet Weight, W <sub>1</sub> (grams)	1350		
Unused Wet Weight, W <sub>2</sub> (grams)	183.8		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1166.2		
Wet Density (pcf)	112.5		
Dry Density (pcf)	101.1		
Void Ratio, e	0.67		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
1-27-08	1	30	54.1	45.0	9.1	79	14	4.8E-02	1.165	5.6E-02
1-27-08	2	20	42.9	25.8	17.1	98	14	4.8E-02	1.165	5.6E-02
1-27-08	3	15	36.5	14.5	22.0	95	14	4.8E-02	1.165	5.6E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>5.6E-02</b>	<b>cm/sec</b>
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**HYDRAULIC CONDUCTIVITY TEST REPORT**  
**CONSTANT HEAD METHOD (ASTM D 2434)**

**EAST CAROLINA**

PROJECT: LANDFILL CELL 12  
 PROJECT NO.: J07-1001-58  
 DATE RECEIVED: 2-15-08

TESTED BY: JOHN MATHEW  
 CHECKED BY: PAUL YARBER

SAMPLE NO.	<u>PCSP-7</u>	SAMPLE LOCATION:	<u>STOCKPILE</u>
TYPE	<u>REMOLEDDED</u>	SAMPLE DESCRIPTION:	<u>WASHED SAND</u>

**SAMPLE DIMENSIONS AND PROPERTIES**

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 110.7	DW= 101.6	9.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1200		
Unused Wet Weight, W <sub>2</sub> (grams)	23.5		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1176.5		
Wet Density (pcf)	111.0		
Dry Density (pcf)	101.8		
Void Ratio, e	0.65		

ASSUMED SG= 2.70

**HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT**  
**RIGID WALL PERMEAMETER**

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-19-08	1	60	61.8	54.2	7.6	60	14	2.2E-02	1.165	2.6E-02
2-19-08	2	35	54.8	36.4	18.4	84	14	2.2E-02	1.165	2.5E-02
2-19-08	3	25	49.8	23.9	25.9	82	14	2.1E-02	1.165	2.5E-02

**HYDRAULIC CONDUCTIVITY                      2.5E-02                      cm/sec**

## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 2-15-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-8</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches	centimeters
	Sample Length Between Manometer Outlets	3.000
Sample Diameter	3.006	7.635
Moisture Content (%)	WW= 118.1      DW= 108.3	9.0
Height, H <sub>1</sub>	6.126	15.560
Height, H <sub>2</sub>	0.437	1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689	14.450
Wet Weight, W <sub>1</sub> (grams)	1250	
Unused Wet Weight, W <sub>2</sub> (grams)	89.2	
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1160.8	
Wet Density (pcf)	109.5	
Dry Density (pcf)	100.4	
Void Ratio, e	0.68	

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
2-19-08	1	60	61.5	54.7	6.8	71	14	2.9E-02	1.165	3.4E-02
2-19-08	2	30	52.2	33.7	18.5	94	14	2.8E-02	1.165	3.3E-02
2-19-08	3	20	46.8	21.3	25.5	86	14	2.8E-02	1.165	3.3E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>3.3E-02</b>	<b>cm/sec</b>
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## HYDRAULIC CONDUCTIVITY TEST REPORT

CONSTANT HEAD METHOD (ASTM D 2434)

PROJECT: EAST CAROLINA  
LANDFILL CELL 12

PROJECT NO.: J07-1001-58

DATE RECEIVED: 3-12-08

TESTED BY: JOHN MATHEW

CHECKED BY: PAUL YARBER

SAMPLE NO. <u>PCSP-9</u>	SAMPLE LOCATION: <u>STOCKPILE</u>
TYPE <u>REMOLEDDED</u>	SAMPLE DESCRIPTION: <u>WASHED SAND</u>

### SAMPLE DIMENSIONS AND PROPERTIES

ITEM	inches		centimeters
	Sample Length Between Manometer Outlets	3.000	
Sample Diameter	3.006		7.635
Moisture Content (%)	WW= 150.0	DW= 137.6	9.0
Height, H <sub>1</sub>	6.126		15.560
Height, H <sub>2</sub>	0.437		1.110
Height, H <sub>1</sub> -H <sub>2</sub>	5.689		14.450
Wet Weight, W <sub>1</sub> (grams)	1200.8		
Unused Wet Weight, W <sub>2</sub> (grams)	45		
Net Wet Weight, W <sub>1</sub> -W <sub>2</sub> (grams)	1155.8		
Wet Density (pcf)	109.0		
Dry Density (pcf)	100.0		
Void Ratio, e	0.68		

### HYDRAULIC CONDUCTIVITY TESTING MEASUREMENT RIGID WALL PERMEAMETER

Date	Test Number	Elapsed Time seconds	Manometer Readings		Head H <sub>1</sub> -H <sub>2</sub> (cm)	Flow Q (cc)	Temp °C	K (cm/sec)	Temp Correction	K <sub>20</sub> (cm/sec)
			H <sub>1</sub> (cm)	H <sub>2</sub> (cm)						
3-27-08	1	60	60.8	54.4	6.4	76	16	3.3E-02	1.106	3.6E-02
3-27-08	2	25	49.3	30.6	18.7	91	16	3.2E-02	1.106	3.6E-02
3-27-08	3	15	42.5	16.6	25.9	73	16	3.1E-02	1.106	3.5E-02

<b>HYDRAULIC CONDUCTIVITY</b>	<b>3.6E-02</b>	<b>cm/sec</b>
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# **APPENDIX E**

## **FIELD TEST RESULTS FOR THE SUBGRADE PREPARATION AND COMPACTED CLAY LINER**

### **TABLE OF CONTENTS**

**FIELD DENSITY MAP GRID CHECKLIST**  
**FIELD DENSITY TEST RESULTS FOR SUBGRADE**  
**FIELD DENSITY TEST RESULTS FOR CLAY LINER**  
**FIELD CLAY LINER GRAIN-SIZE TEST SUMMARY**

**FIELD DENSITY MAP GRID CHECKLIST**

# FIELD DENSITY GRIDMAP CHECKLIST

## CONSTRUCTION QUALITY ASSURANCE - CELL NO.12 EAST CAROLOINA REGIONAL MSW LANDFILL MONTGOMERY COUNTY, NORTH CAROLINA

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 = 759,000 sq ft (17.5 Acres) = 40,170 cy Soil Liner

MAP GRID NUMBER	FIELD DENSITY TEST NUMBER			
	SUBGRADE	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3
1	SFD-220	CLD-25	CLD-147	CLD-182
2	SFD-221	CLD-236	CLD-153	CLD-196
3	SFD-214	CLD-14	CLD-121	CLD-166
4	SFD-215	CLD-17	CLD-123	CLD-167
5	SFD-216	CLD-20	CLD-136	CLD-172
6	SFD-217	CLD-22	CLD-141	CLD-181
7	SFD-218	CLD-24	CLD-146	CLD-183
8	SFD-219	CLD-27	CLD-152	CLD-195
9	SFD-314	CLD-237	CLD-247	CLD-262
10	SFD-159	CLD-4	CLD-67	CLD-90
11	SFD-160	CLD-6	CLD-69	CLD-86
12	SFD-161	CLD-8	CLD-71	CLD-85
13	SFD-162	CLD-10	CLD-119	CLD-158
14	SFD-190	CLD-13	CLD-120	CLD-165
15	SFD-191	CLD-16	CLD-122	CLD-173
16	SFD-192	CLD-19	CLD-135	CLD-184
17	SFD-193	CLD-21	CLD-140	CLD-180
18	SFD-194	CLD-23	CLD-145	CLD-184
19	SFD-195	CLD-26	CLD-151	CLD-194
20	SFD-315	CLD-238	CLD-248	CLD-260
21	SFD-316	CLD-239	CLD-249	CLD-261
22	SFD-103	CLD-2	CLD-64	CLD-91
23	SFD-165	CLD-3	CLD-65	CLD-89
24	SFD-102	CLD-5	CLD-66	CLD-88
25	SFD-106	CLD-7	CLD-68	CLD-87
26	SFD-163	CLD-9	CLD-70	CLD-84
27	SFD-164	CLD-11	CLD-118	CLD-159
28	SFD-182	CLD-12	CLD-126	CLD-164
29	SFD-183	CLD-15	CLD-129	CLD-169
30	SFD-184	CLD-18	CLD-132	CLD-174
31	SFD-185	CLD-49	CLD-139	CLD-179
32	SFD-186	CLD-51	CLD-144	CLD-185
33	SFD-187	CLD-95	CLD-150	CLD-188
34	SFD-317	CLD-240	CLD-240	CLD-267

MAP GRID NUMBER	FIELD DENSITY TEST NUMBER			
	SUBGRADE	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3
35	SFD-318	CLD-241	CLD-250	CLD-259
36	SFD-158	CLD-1	CLD-63	CLD-83
37	SFD-99	CLD-39	CLD-62	CLD-82
38	SFD-100	CLD-37	CLD-59	CLD-81
39	SFD-101	CLD-35	CLD-61	CLD-80
40	SFD-105	CLD-33	CLD-58	CLD-79
41	SFD-136	CLD-31	CLD-60	CLD-78
42	SFD-137	CLD-29	CLD-124	CLD-160
43	SFD-181	CLD-42	CLD-127	CLD-163
44	SFD-180	CLD-44	CLD-130	CLD-170
45	SFD-179	CLD-46	CLD-133	CLD-175
46	SFD-178	CLD-48	CLD-138	CLD-178
47	SFD-177	CLD-50	CLD-143	CLD-186
48	SFD-176	CLD-94	CLD-149	CLD-189
49	SFD-175	CLD-97	CLD-155	CLD-191
50	SFD-319	CLD-242	CLD-251	CLD-257
51	SFD-322	CLD-243	CLD-252	CLD-258
52	SFD-157	CLD-40	CLD-57	CLD-77
53	SFD-81R	CLD-38	CLD-56R	CLD-74
54	SFD-82	CLD-36	CLD-55	CLD-76
55	SFD-83R	CLD-34	CLD-54	CLD-73
56	SFD-84	CLD-32	CLD-53	CLD-75
57	SFD-85R	CLD-30R	CLD-52	CLD-72
58	SFD-86R	CLD-28	CLD-125	CLD-161
59	SFD-168	CLD-41	CLD-128	CLD-162
60	SFD-169	CLD-43	CLD-131	CLD-171
61	SFD-170	CLD-45	CLD-134	CLD-176
62	SFD-171	CLD-47	CLD-137	CLD-177
63	SFD-172	CLD-92	CLD-142	CLD-187
64	SFD-173	CLD-93	CLD-148	CLD-190
65	SFD-174	CLD-96	CLD-154	CLD-192
66	SFD-320	CLD-244	CLD-244	CLD-253
67	SFD-321	CLD-245	CLD-245	CLD-255
68	SFD-323	CLD-246	CLD-246	CLD-256

**FIELD DENSITY TEST RESULTS FOR SUBGRADE**

**SUMMARY OF FIELD DENSITY RETESTS  
STRUCTURAL FILL  
CONSTRUCTION OF CELL NO. 12  
EAST CAROLINA REGIONAL MSW LANDFILL  
BLE Project No. J07-1001-58**

<b>FAILING TESTS</b>				<b>PASSING RETESTS</b>			
<b>Date of Test</b>	<b>Test Number</b>	<b>Elevation</b>	<b>Location</b>	<b>Date of Retest</b>	<b>Retest Number</b>	<b>Elevation</b>	<b>Location</b>
12/13/2007	SFD-81	SG	GRID 53	12/19/2007	SFD-81R	SG	GRID 53
12/13/2007	SFD-85	SG	GRID 57	12/19/2007	SFD-85R	SG	GRID 57
12/13/2007	SFD-86	SG	GRID 58	12/19/2007	SFD-86R	SG	GRID 58
12/13/2007	SFD-83	SG	GRID 55	12/19/2007	SFD-83R	SG	GRID 55
12/20/2007	SFD-104	SG	GRID 23	1/14/2008	SFD-165	SG	GRID 23
1/5/2008	SFD-124	-1.0'	GRID33	1/9/2008	SFD-124R	-1.0'	GRID33
1/10/2008	SFD-141	-7.0'	GRID 4	1/13/2008	SFD-154	-7.0'	GRID 4
1/10/2008	SFD-142	SG	GRID 31	1/15/2008	SFD-185	SG	GRID 31

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-1	TP-5-C9	5.31	1.39	3.92	117.7	FT	200	159.7	40.3	25.2	3.7	94.0	95	95	P	-5	42
SFD-2	TP-5-C9	5.44	1.39	4.05	121.6	FT	200	160.0	40.0	25.0	3.5	97.3	98	95	P	-4	38
SFD-3	TP-5-C9	5.33	1.39	3.94	118.3	FT	200	160.9	39.1	24.3	2.8	95.2	96	95	P	-3	31
SFD-4	TP-5-C9	5.44	1.39	4.05	121.6	FT	200	158.8	41.2	25.9	4.4	96.6	97	95	P	-2	36
SFD-5	TP-5-C9	5.37	1.39	3.98	119.5	FT	200	159.4	40.6	25.5	4.0	95.3	96	95	P	-1	44
CHECK PLUG	TP-5-C9	8.51	4.60	3.91	117.4	FT	200	165.7	34.3	20.7		97.3					

Proctor Curve No. <u>TP-5-C9</u>	Maximum Dry Density PCF <u>99.2</u>	Optimum Moisture % <u>21.5</u>	Technician <u>TED STILES</u>
			Date <u>11/13/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-6	TP-5-C9	5.38	1.39	3.99	119.8	FT	200	161.4	38.6	23.9	2.4	96.7	97	95	P	EG	38
SFD-7	TP-5-C9	5.33	1.39	3.94	118.3	FT	200	160.1	39.9	24.9	3.4	94.7	95	95	P	EG	43
SFD-8	TP-5-C9	5.40	1.39	4.01	120.4	FT	200	159.4	40.6	25.5	4.0	96.0	97	95	P	-5	35

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>TP-5-C9</u>	<u>99.2</u>	<u>21.5</u>	Date	<u>11/14/2007</u>
_____	_____	_____	Checked By:	<u>JEFF HELVEY, P.E.</u>
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-9	TP-5-C9	5.35	1.39	3.96	118.9	FT	200	159.5	40.5	25.4	3.9	94.8	96	95	P	-3	M1
SFD-10	TP-5-C9	5.39	1.39	4.00	120.1	FT	200	160.3	39.7	24.8	3.3	96.3	97	95	P	EG	31

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>TP-5-C9</u>	<u>99.2</u>	<u>21.5</u>	Date	<u>11/16/2007</u>
_____	_____	_____	Checked By:	<u>JEFF HELVEY, P.E.</u>
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-11	TP-5-C9	5.37	1.39	3.98	119.5	FT	200	158.6	41.4	26.1	4.6	94.8	96	95	P	EG	34

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>TP-5-C9</u>	<u>99.2</u>	<u>21.5</u>	Date	<u>11/17/2007</u>
_____	_____	_____	Checked By:	<u>JEFF HELVEY, P.E.</u>
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-12	SF-4-C11	5.61	1.37	4.24	127.3	FT	200	175.8	24.2	13.8	2.7	111.9	100	95	P	-16	20
SFD-13	SF-4-C11	5.56	1.39	4.17	125.2	FT	200	174.3	25.7	14.7	3.6	109.1	98	95	P	-19	9
CHECK PLUG	SF-4-C11	8.57	4.60	3.97	119.2	FT	200	183.3	16.7	9.1		109.3					
SFD-14	SF-4-C11	5.52	1.37	4.15	124.6	FT	200	174.9	25.1	14.4	3.3	109.0	98	95	P	-3	8
SFD-15	SF-4-C11	5.39	1.39	4.00	120.1	FT	200	176.5	23.5	13.3	2.2	106.0	95	95	P	-2	19

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician <u>TED STILES</u>
			Date <u>11/18/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-16	SF-4-C11	5.36	1.37	3.99	119.8	FT	200	179.4	20.6	11.5	0.4	107.5	96	95	P	-3	60
SFD-17	SF-4-C11	5.48	1.39	4.09	122.8	FT	200	177.2	22.8	12.9	1.8	108.8	98	95	P	-3	44
CHECK PLUG	SF-4-C11	8.50	4.60	3.90	117.1	FT	200	185.0	15.0	8.1		108.3					
SFD-18	SF-4-C11	5.41	1.37	4.04	121.3	FT	200	177.3	22.7	12.8	1.7	107.6	96	95	P	-9	E
SFD-19	SF-4-C11	5.53	1.39	4.14	124.3	FT	200	177.5	22.5	12.7	1.6	110.3	99	95	P	-24	2

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician  <u>TED STILES</u>
			Date  <u>11/19/2007</u>
			Checked By:  <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-20	TP-5-C9	5.39	1.37	4.02	120.7	FT	200	159.6	40.4	25.3	3.8	96.3	97	95	P	-7	7
SFD-21	SF-4-C11	5.33	1.39	3.94	118.3	FT	200	180.3	19.7	10.9	-0.2	106.7	96	95	P	-16	D
CHECK PLUG	SF-4-C11	8.54	4.60	3.94	118.3	FT	200	184.7	15.3	8.3		109.3					
SFD-22	SF-4-C11	5.48	1.37	4.11	123.4	FT	200	177.3	22.7	12.8	1.7	109.4	98	95	P	-5	30
SFD-23	TP-5-C9	5.28	1.39	3.89	116.8	FT	200	160.6	39.4	24.5	3.0	93.8	95	95	P	-5	16
SFD-24	SF-4-C11	5.44	1.37	4.07	122.2	FT	200	176.1	23.9	13.6	2.5	107.6	97	95	P	-5	29
SFD-25	SF-4-C11	5.43	1.39	4.04	121.3	FT	200	178.9	21.1	11.8	0.7	108.5	97	95	P	-5	15

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>SF-4-C11</u>	<u>111.5</u>	<u>11.1</u>	Date	<u>11/20/2007</u>
<u>TP-5-C9</u>	<u>99.2</u>	<u>21.5</u>	Checked By:	<u>JEFF HELVEY, P.E.</u>
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-26	SF-4-C11					122.1	13.5	FT						2.4	107.6	96	95	P	-3.0	63
SFD-27	SF-4-C11					120.2	11.2	FT						0.1	108.1	97	95	P	-3.0	59
SFD-28	SF-4-C11					123.3	12.1	FT						1.0	110.0	99	95	P	-3.0	57
SFD-29	SF-4-C11					124.1	10.8	FT						-0.3	112.0	100	95	P	-3.0	54
SFD-30	SF-4-C11					119.1	9.7	FT						-1.4	108.6	97	95	P	-2.0	49
SFD-31	SF-4-C11					118.4	8.3	FT						-2.8	109.3	98	95	P	-24.0	51
SFD-32	SF-4-C11					117.0	9.7	FT						-1.4	106.7	96	95	P	-26.0	T1
SFD-33	SF-4-C11					120.2	8.4	FT						-2.7	110.9	99	95	P	-8.0	52
SFD-26	SF-4-C11	5.45	1.39	4.06	121.9			FT	200	176.1	23.9	13.6		107.4						

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
_____	_____	_____	Date: <u>11/27/2007</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>
_____	_____	_____	

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-34	SF-4-C11					122.2	13.4	FT					2.3	107.8	97	95	P	-2.0	54
SFD-35	SF-4-C11					121.4	14.6	FT					3.5	105.9	95	95	P	-2.0	56
SFD-36	SF-4-C11					121.6	14.6	FT					3.5	106.1	95	95	P	-2.0	58
SFD-37	SF-4-C11					122.1	14.0	FT					2.9	107.1	96	95	P	-3.0	43
SFD-38	SF-4-C11					123.8	14.2	FT					3.1	108.4	97	95	P	-2.0	60
CALIBRATION	SF-4-C11	5.47	1.39	4.08	122.5			FT	200	174.5	25.5	14.6		106.9					

Proctor  
Curve No.  
SF-4-C11

Maximum Dry Density  
PCF  
111.5

Optimum Moisture  
%  
11.1

Technician:

TED STILES

Date:

11/28/2007

Checked By:

JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-39	SF-4-C11					123.1	11.8	FT						0.7	110.1	99	95	P	-1.0	53
SFD-40	SF-4-C11					124.3	11.9	FT						0.8	111.1	100	95	P	-1.0	55
SFD-41	SF-4-C11					120.7	13.3	FT						2.2	106.5	96	95	P	-1.0	57
SFD-42	SF-4-C11					121.7	12.6	FT						1.5	108.1	97	95	P	-1.0	59
CALIBRATION	SF-4-C11	5.42	1.39	4.03	121.0			FT	200	174.1	25.9	14.9			105.3					

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
			Date: <u>11/29/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-43	SF-4-C11					122.4	11.7	FT						0.6	109.6	98	95	P	-16.0	R1
SFD-44	SF-4-C11					119.9	10.2	FT						-0.9	108.8	98	95	P	-6.0	Q1
SFD-45	SF-4-C11					121.4	10.1	FT						-1.0	110.3	99	95	P	-14.0	36
SFD-46	SF-4-C11					122.2	11.3	FT						0.2	109.8	98	95	P	-7.0	K1
CALIBRATION	SF-4-C11	5.41	1.39	4.02	120.7			FT	200	179.7	20.3	11.3		108.5						

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
			Date: <u>12/4/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-47	SF-4-C11					123.2	12.3	FT						1.2	109.7	98	95	P	-14.0	R1
SFD-48	SF-4-C11					123.6	13.6	FT						2.5	108.8	98	95	P	-5.0	K1
SFD-49	SF-4-C11					120.8	12.6	FT						1.5	107.3	96	95	P	-10.0	22
SFD-50	SF-4-C11					121.5	11.5	FT						0.4	109.0	98	95	P	-10.0	C1
CALIBRATION	SF-4-C11	5.40	1.39	4.01	120.4			FT	200	179.5	20.5	11.4		108.1						

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
			Date: <u>12/5/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-51	P-4-4					123.3	22.4	FT						2.9	100.7	96	95	P	-4.0	Q1
SFD-52	P-4-4					121.6	21.2	FT						1.7	100.3	96	95	P	-12.0	36
SFD-53	P-4-4					123.9	20.2	FT						0.7	103.1	98	95	P	-15.0	L1
SFD-54	P-4-4					124.8	22.1	FT						2.6	102.2	97	95	P	-16.0	D1
CALIBRATION	P-4-4	5.50	1.39	4.11	123.4			FT	200	165.6	34.4	20.8			102.2					

Proctor Curve No.  
P-4-4

Maximum Dry Density PCF  
104.9

Optimum Moisture %  
19.5

Technician:

TED STILES

Date:

12/6/2007

Checked By:

JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-55	SF-4-C11					121.3	11.2	FT						0.1	109.1	98	95	P	-5.0	52
SFD-56	SF-4-C11					123.7	12.1	FT						1.0	110.3	99	95	P	-6.0	22
SFD-57	SF-4-C11					123.8	13.4	FT						2.3	109.2	98	95	P	-9.0	R1
SFD-58	SF-4-C11					123.0	10.2	FT						-0.9	111.6	100	95	P	-10.0	C1
CALIBRATION	SF-4-C11	5.37	1.39	3.98	119.5			FT	200	179.9	20.1	11.2		107.5						

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
			Date: <u>12/7/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
SFD-59	P-4-4					124.6	22.8	FT					3.3	101.5	97	95	P	-4.0	Q1
SFD-60	P-4-4					123.7	21.6	FT					2.1	101.7	97	95	P	-4.0	B1
SFD-61	P-4-4					125.6	21.8	FT					2.3	103.1	98	95	P	-2.0	J1
SFD-62	P-4-4					124.6	21.2	FT					1.7	102.8	98	95	P	-2.0	R
CALIBRATION	P-4-4	5.47	1.39	4.08	122.5			FT	200	164.3	35.7	21.7		100.7					

Proctor Curve No. <u>P-4-4</u>	Maximum Dry Density PCF <u>104.9</u>	Optimum Moisture % <u>19.5</u>	Technician: <u>TED STILES</u>
			Date: <u>12/8/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-63	SF-4-C11					119.5	11.2	FT						0.1	107.5	96	95	P	-2.0	Q1
SFD-64	SF-4-C11					122.5	11.5	FT						0.4	109.9	99	95	P	-3.0	B1
SFD-65	SF-4-C11					125.5	15.0	FT						3.9	109.1	98	95	P	-6.0	36
SFD-66	SF-2-C11					123.1	18.2	FT						0.9	104.1	96	95	P	-8.0	C1
CHECK PLUG	SF-2-C11	8.71	4.60	4.11	123.4			FT	200	173.0	27.0	15.6			106.8					
CALIBRATION	SF-4-C11	5.38	1.39	3.99	119.8			FT	200	178.4	21.6	12.1			106.9					
SFD-67	SF-4-C11					114.7	8.2	FT						-2.9	106.0	95	95	P	-5.0	R1
SFD-68	SF-4-C11					117.7	9.2	FT						-1.9	107.8	97	95	P	-7.0	L1

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %
SF-4-C11	111.5	11.1
SF-2-C11	108.7	17.3

Technician: TED STILES

Date: 12/9/2007

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-69	SF-4-C11					123.7	11.9	FT					0.8	110.5	99	95	P	-3.0	36
SFD-70	SF-4-C11					122.5	13.8	FT					2.7	107.6	97	95	P	-3.0	K1
CALIBRATION	SF-4-C11	5.44	1.39	4.05	121.6			FT	200	177.4	22.6	12.7		107.9					
SFD-71	P-4-4					125.5	22.4	FT					2.9	102.5	98	95	P	-16.0	10
SFD-72	P-4-4					121.3	20.6	FT					1.1	100.6	96	95	P	-12.0	U

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician:	TED STILES
SF-4-C11	111.5	11.1	Date:	12/10/2007
P-4-4	104.9	19.5	Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
SFD-73	P-4-4					122.8	22.0	FT					2.5	100.7	96	95	P	-14.0	T
SFD-74	P-4-4					121.0	20.4	FT					0.9	100.5	96	95	P	-13.0	10
SFD-75	SF-4-C11					121.9	12.2	FT					1.1	108.6	97	95	P	-17.0	V
SFD-76	SF-4-C11					121.9	12.6	FT					1.5	108.3	97	95	P	-14.0	12
CALIBRATION	P-4-4	5.56	1.39	4.17	125.2			FT	200	177.6	22.4	12.6		111.2					

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
<u>P-4-4</u>	<u>104.9</u>	<u>19.5</u>	Date: <u>12/11/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor:      0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-77	SF-4-C11					121.9	11.4	FT						0.3	109.4	98	95	P	-15.0	W
SFD-78	SF-4-C11					119.2	12.0	FT						0.9	106.4	95	95	P	-15.0	E1
SFD-79	SF-4-C11					119.5	13.4	FT						2.3	105.4	95	95	P	-4.0	26
SFD-80	SF-4-C11					120.4	12.1	FT						1.0	107.4	96	95	P	-4.0	24
CALIBRATION	SF-4-C11	5.41	1.39	4.02	120.7			FT	200	178.9	21.1	11.8		108.0						

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician: <u>TED STILES</u>
			Date: <u>12/12/2007</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	SUBGRADE			P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)	% COMP.		REQ. COMP. (%)					
SFD-81	SF-4-C11					123.7	16.7	FT					5.6	106.0	95	95	F	SG	53		
SFD-82	SF-4-C11					126.4	14.2	FT					3.1	110.7	99	95	P	SG	54		
SFD-83	SF-4-C11					125.8	18.1	FT					7.0	106.5	96	95	F	SG	55		
SFD-84	SF-4-C11					127.9	13.6	FT					2.5	112.6	101	95	P	SG	56		
SFD-85	SF-4-C11					125.2	17.9	FT					6.8	106.2	95	95	F	SG	57		
SFD-86	SF-4-C11					124.9	17.6	FT					6.5	106.2	95	95	F	SG	58		
SFD-87	SF-4-C11					121.3	11.7	FT					0.6	108.6	97	95	P	H	-10		
SFD-88	SF-4-C11					123.4	13.3	FT					2.2	108.9	98	95	P	F1	-12		
SFD-89	SF-4-C11					118.9	11.5	FT					0.4	106.6	96	95	P	23.0	23		
SFD-90	SF-4-C11					122.2	14.8	FT					3.7	106.4	95	95	P	25.0	25		

Proctor Curve No.  
SF-4-C11

Maximum Dry Density  
PCF  
111.5

Optimum Moisture  
%  
11.1

Technician:

TED STILES

Date:

12/13/2007

Checked By:

JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
SFD-91	SF-4-C11					124.0	14.4	FT					3.3	108.4	97	95	P	-12.0	V
SFD-92	SF-2-C11					124.3	19.4	FT					2.1	104.1	96	95	P	-6.0	10
SFD-93	SF-4-C11					123.7	13.7	FT					2.6	108.8	98	95	P	-10.0	12
SFD-94	SF-4-C11					121.0	12.8	FT					1.7	107.3	96	95	P	-8.0	D1
*CHECK PLUG	SF-2-C11	8.66	4.60	4.06	121.9			FT	200	174.4	25.6	14.7		106.3				-6.0	10

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %
SF-4-C11	111.5	11.1
SF-2-C11	108.7	17.3

Technician: TED STILES

Date: 12/14/2007

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	SUBGRADE			P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)	% COMP.		REQ. COMP. (%)					
SFD-95	SF-4-C11					121.6	12.3	FT						1.2	108.3	97	95	P	-6.0	23	
SFD-96	SF-4-C11					124.3	14.3	FT						3.2	108.7	98	95	P	-8.0	U	
SFD-97	SF-4-C11					125.5	14.5	FT						3.4	109.6	98	95	P	-7.0	V	
SFD-98	SF-4-C11					124.3	12.9	FT						1.8	110.1	99	95	P	-7.0	E1	

Proctor Curve No.  
SF-4-C11

Maximum Dry Density PCF  
111.5

Optimum Moisture %  
11.1

Technician: TED STILES

Date: 12/15/2007

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-86R	SF-4-C11	5.54	1.37	4.17	125.2	FT	200	175.9	24.1	13.7	2.6	110.1	99	95	P	SG	58	
SFD-85R	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	176.6	23.4	13.3	2.2	108.7	98	95	P	SG	57	
SFD-83R	SF-4-C11	5.45	1.37	4.08	122.5	FT	200	174.4	25.6	14.7	3.6	106.8	96	95	P	SG	55	
SFD-81R	SF-4-C11	5.35	1.39	3.96	118.9	FT	200	179.1	20.9	11.7	0.6	106.5	96	95	P	SG	53	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
SF-4-C11	<u>111.5</u>	<u>11.1</u>	Date	<u>12/19/2007</u>
_____	_____	_____	Checked By:	<u>JEFF HELVEY, P.E.</u>
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-99	SF-4-C11	5.31	1.37	3.94	118.3	FT	200	179.4	20.6	11.5	0.4	106.1	95	95	P	SG	37	
SFD-100	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	174.4	25.6	14.7	3.6	106.3	95	95	P	SG	38	
SFD-101	SF-4-C11	5.60	1.37	4.23	127.0	FT	200	174.0	26.0	14.9	3.8	110.5	99	95	P	SG	39	
SFD-102	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	175.9	24.1	13.7	2.6	107.2	96	95	P	SG	24	
SFD-103	SF-4-C11	5.61	1.37	4.24	127.3	FT	200	174.1	25.9	14.9	3.8	110.8	99	95	P	SG	22	
SFD-104	SF-4-C11	5.28	1.39	3.89	116.8	FT	200	171.3	28.7	16.8	5.7	100.1	90	95	F	SG	23	
SFD-105	SF-4-C11	5.49	1.37	4.12	123.7	FT	200	180.4	19.6	10.9	-0.2	111.6	100	95	P	SG	40	
SFD-106	SF-4-C11	5.34	1.39	3.95	118.6	FT	200	180.1	19.9	11.0	-0.1	106.8	96	95	P	SG	25	
SFD-107	SF-4-C11	5.48	1.37	4.11	123.4	FT	200	175.7	24.3	13.8	2.7	108.4	97	95	P	-4	W	
SFD-108	SF-4-C11	5.46	1.39	4.07	122.2	FT	200	179.4	20.6	11.5	0.4	109.6	98	95	P	-4	E1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	12/20/2007
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-109	SF-4-C11	5.35	1.37	3.98	119.5	FT	200	179.9	20.1	11.2	0.1	107.5	96	95	P	SG	26	
SFD-110	SF-4-C11	5.42	1.39	4.03	121.0	FT	200	182.8	17.2	9.4	-1.7	110.6	99	95	P	SG	41	
SFD-111	SF-4-C11	5.33	1.37	3.96	118.9	FT	200	179.3	20.7	11.5	0.4	106.6	96	95	P	SG	42	
SFD-112	SF-4-C11	5.36	1.39	3.97	119.2	FT	200	182.5	17.5	9.6	-1.5	108.8	98	95	P	SG	27	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	12/20/2007
_____	_____	_____	Checked By:	JEFF HELVEY, P.E.
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-113	SF-4-C11	5.39	1.37	4.02	120.7	FT	200	174.9	25.1	14.4	3.3	105.6	95	95	P	-1	59	
SFD-114	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	174.1	25.9	14.9	3.8	106.1	95	95	P	-2	44	
SFD-115	SF-4-C11	5.41	1.37	4.04	121.3	FT	200	177.8	22.2	12.5	1.4	107.9	97	95	P	-3	30	
SFD-116	SF-4-C11	5.43	1.39	4.04	121.3	FT	200	176.9	23.1	13.1	2.0	107.3	96	95	P	-2	46	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/3/2008
_____	_____	_____	Checked By:	JEFF HELVEY, P.E.
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-117	SF-4-C11	5.47	1.37	4.1	123.1	FT	200	174.3	25.7	14.7	3.6	107.3	96	95	P	-1	48	
SFD-118	SF-4-C11	5.42	1.39	4.03	121.0	FT	200	176.5	23.5	13.3	2.2	106.8	96	95	P	-7	50	
SFD-119	SF-4-C11	5.44	1.37	4.07	122.2	FT	200	174.8	25.2	14.4	3.3	106.8	96	95	P	-4	14	
SFD-120	SF-4-C11	5.40	1.39	4.01	120.4	FT	200	175.9	24.1	13.7	2.6	105.9	95	95	P	-3	16	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/4/2008
_____	_____	_____	Checked By:	JEFF HELVEY, P.E.
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-121	SF-4-C11	5.35	1.37	3.98	119.5	FT	200	180.6	19.4	10.7	-0.4	107.9	97	95	P	-2	31	
SFD-122	SF-4-C11	5.38	1.39	3.99	119.8	FT	200	176.9	23.1	13.1	2.0	106.0	95	95	P	-8	6	
SFD-123	SF-4-C11	5.37	1.37	4.00	120.1	FT	200	178.1	21.9	12.3	1.2	107.0	96	95	P	-2	18	
SFD-124	SF-4-C11	5.42	1.39	4.03	121.0	FT	200	172.4	27.6	16.0	4.9	104.3	94	95	F	-1	33	
SFD-125	TP-5-C9	5.44	1.37	4.07	122.2	FT	200	161.9	38.1	23.5	2.0	98.9	100	95	P	-21	N	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/5/2008
TP-5-C9	99.2	21.5	Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-126	SF-2-C11	5.61	1.37	4.24	127.3	FT	200	171.6	28.4	16.6	-0.7	109.2	101	95	P	-21	L	
SFD-127	SF-2-C11	5.60	1.39	4.21	126.4	FT	200	169.6	30.4	17.9	0.6	107.2	99	95	P	-14	J	
SFD-128	SF-2-C11	5.62	1.37	4.25	127.6	FT	200	169.2	30.8	18.2	0.9	108.0	99	95	P	-20	X	
CHECK PLUG	SF-2-C11	8.78	4.60	4.18	125.5	FT	200	172.3	27.7	16.1		108.1						

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-2-C11	108.7	17.3	Date	1/6/2008
_____	_____	_____	Checked By:	JEFF HELVEY, P.E.
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-129	SF-2-C11	5.46	1.37	4.09	122.8	FT	200	171.1	28.9	16.9	-0.4	105.1	97	95	P	-19	Y	
SFD-130	SF-2-C11	5.49	1.39	4.10	123.1	FT	200	169.1	30.9	18.3	1.0	104.1	96	95	P	-19	M	
SFD-131	SF-2-C11	5.54	1.37	4.17	125.2	FT	200	170.2	29.8	17.5	0.2	106.6	98	95	P	-14	D	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-2-C11	108.7	17.3	Date	1/7/2008
_____	_____	_____	Checked By:	JEFF HELVEY, P.E.
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-132	SF-2-C11	5.50	1.37	4.13	124.0	FT	200	170.4	29.6	17.4	0.1	105.7	97	95	P	-4	3
SFD-133	TP-5-C9	5.44	1.39	4.05	121.6	FT	200	163.1	36.9	22.6	1.1	99.2	100	95	P	-1	29
CHECK PLUG	TP-5-C9	8.56	4.60	3.96	118.9	FT	200	167.6	32.4	19.3		99.7					
SFD-134	SF-2-C11	5.49	1.37	4.12	123.7	FT	200	168.9	31.1	18.4	1.1	104.5	96	95	P	-5	5
SFD-135	SF-2-C11	5.51	1.39	4.12	123.7	FT	200	169.9	30.1	17.7	0.4	105.1	97	95	P	-1	17
SFD-136	SF-4-C11	5.58	1.37	4.21	126.4	FT	200	174.3	25.7	14.7	3.6	110.2	99	95	P	SG	41
SFD-137	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	175.4	24.6	14.0	2.9	108.0	97	95	P	SG	42

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-2-C11	108.7	17.3	Date	1/8/2008
TP-5-C9	99.2	21.5	Checked By:	JEFF HELVEY, P.E.
SF-4-C11	111.5	11.1		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-124R	SF-2-C11	5.45	1.37	4.08	122.5	FT	200	168.8	31.2	18.5	1.2	103.4	95	95	P	-1	33	
SFD-138	SF-2-C11	5.60	1.39	4.21	126.4	FT	200	171.9	28.1	16.3	-1.0	108.7	100	95	P	-17	9	
SFD-139	SF-2-C11	5.57	1.37	4.20	126.1	FT	200	171.6	28.4	16.6	-0.7	108.2	100	95	P	-17	21	
SFD-140	SF-4-C11	5.51	1.39	4.12	123.7	FT	200	174.0	26.0	14.9	3.8	107.6	97	95	P	-6	50	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/9/2008
SF-2-C11	108.7	17.3	Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DEPTH BELOW SUBGRADE (feet)	GRID LOCATION			
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)	DRY DENSITY (pcf)			% COMP. (%)	REQ. COMP. (%)	P/F
SFD-141	SF-4-C11	5.48	1.37	4.11	123.4	FT	200	171.9	28.1	16.3	5.2	106.1	95	95	F	-7	4
SFD-142	SF-4-C11	5.47	1.39	4.08	122.5	FT	200	172.7	27.3	15.8	4.7	105.8	95	95	F	SG	31
SFD-143	SF-4-C11	5.51	1.37	4.14	124.3	FT	200	176.5	23.5	13.3	2.2	109.7	98	95	P	-6	1
SFD-144	SF-4-C11	5.44	1.39	4.05	121.6	FT	200	177.6	22.4	12.6	1.5	108.0	97	95	P	-1	34
CHECK PLUG	SF-4-C11	8.62	4.60	4.02	120.7	FT	200	181.5	18.5	10.2		109.6					

Proctor Curve No. SF-4-C11	Maximum Dry Density PCF 111.5	Optimum Moisture % 11.1	Technician  Date	TED STILES  1/10/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-145	CLSP-2-C12	5.50	1.37	4.13	124.0	FT	200	165.5	34.5	20.8	2.8	102.6	97	95	P	-7	E	
SFD-146	CLSP-2-C12	5.48	1.39	4.09	122.8	FT	200	164.4	35.6	21.7	3.7	101.0	96	95	P	-7	B	
SFD-147	CLSP-2-C12	5.43	1.37	4.06	121.9	FT	200	164.8	35.2	21.4	3.4	100.5	95	95	P	-20	2	
SFD-148	CLSP-2-C12	5.49	1.39	4.10	123.1	FT	200	163.9	36.1	22.0	4.0	100.9	95	95	P	-18	L	

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>1/11/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-149	CLSP-2-C12	5.48	1.37	4.11	123.4	FT	200	164.5	35.5	21.6	3.6	101.5	96	95	P	-8	5	
SFD-150	CLSP-2-C12	5.51	1.39	4.12	123.7	FT	200	165.0	35.0	21.2	3.2	102.1	97	95	P	-16	X	
SFD-151	CLSP-2-C12	5.54	1.37	4.17	125.2	FT	200	164.2	35.8	21.8	3.8	102.8	97	95	P	-16	M	
SFD-152	CLSP-2-C12	5.46	1.39	4.07	122.2	FT	200	165.8	34.2	20.6	2.6	101.3	96	95	P	-11	K	
CHECK PLUG	CLSP-2-C12	8.65	4.60	4.05	121.6	FT	200	171.2	28.8	16.8		104.1						

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1/12/2008</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-153	CLSP-2-C12	5.52	1.37	4.15	124.6	FT	200	164.6	35.4	21.5	3.5	102.6	97	95	P	-15	L	
SFD-154	CLSP-2-C12	5.55	1.39	4.16	124.9	FT	200	165.4	34.6	20.9	2.9	103.3	98	95	P	-7	4	
SFD-155	CLSP-2-C12	5.47	1.37	4.10	123.1	FT	200	165.1	34.9	21.1	3.1	101.6	96	95	P	-7	3	
SFD-156	CLSP-2-C12	5.53	1.39	4.14	124.3	FT	200	164.1	35.9	21.9	3.9	102.0	97	95	P	-6	6	

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>1/13/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
<b>CALIBRATION</b>	<b>SF-4-C11</b>	<b>5.58</b>	<b>1.37</b>	<b>4.21</b>	<b>126.4</b>			<b>FT</b>	<b>200</b>	<b>175.1</b>	<b>24.9</b>	<b>14.2</b>		<b>110.7</b>					
<b>SFD-157</b>	<b>SF-4-C11</b>					<b>126.5</b>	<b>14.3</b>	<b>FT</b>					<b>3.2</b>	<b>110.7</b>	<b>99</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>52</b>
<b>SFD-158</b>	<b>SF-4-C11</b>					<b>122.1</b>	<b>15.0</b>	<b>FT</b>					<b>3.9</b>	<b>106.2</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>36</b>
<b>SFD-159</b>	<b>SF-4-C11</b>					<b>124.7</b>	<b>12.3</b>	<b>FT</b>					<b>1.2</b>	<b>111.0</b>	<b>100</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>10</b>
<b>SFD-160</b>	<b>SF-4-C11</b>					<b>124.1</b>	<b>14.6</b>	<b>FT</b>					<b>3.5</b>	<b>108.3</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>11</b>
<b>SFD-161</b>	<b>SF-4-C11</b>					<b>122.7</b>	<b>13.9</b>	<b>FT</b>					<b>2.8</b>	<b>107.7</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>12</b>
<b>SFD-162</b>	<b>SF-4-C11</b>					<b>122.1</b>	<b>14.4</b>	<b>FT</b>					<b>3.3</b>	<b>106.7</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>13</b>
<b>SFD-163</b>	<b>SF-4-C11</b>					<b>125.6</b>	<b>13.1</b>	<b>FT</b>					<b>2.0</b>	<b>111.1</b>	<b>100</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>26</b>
<b>SFD-164</b>	<b>SF-4-C11</b>					<b>124.3</b>	<b>13.9</b>	<b>FT</b>					<b>2.8</b>	<b>109.1</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>27</b>
<b>SFD-165</b>	<b>SF-4-C11</b>					<b>122.3</b>	<b>13.7</b>	<b>FT</b>					<b>2.6</b>	<b>107.6</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>23</b>

Proctor Curve No. <b>SF-4-C11</b>	Maximum Dry Density PCF <b>111.5</b>	Optimum Moisture % <b>11.1</b>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Technician: TED STILES

Date: 1/14/2008

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-166	CLSP-2-C12					126.3	20.1	FT					2.1	105.2	99	95	P	-9.0	Y
SFD-167	CLSP-2-C12					126.9	19.3	FT					1.3	106.4	101	95	P	-5.0	1
SFD-168	SF-4-C11					124.2	11.5	FT					0.4	111.4	100	95	P	SG	59
SFD-169	SF-4-C11					122.7	14.6	FT					3.5	107.1	96	95	P	SG	60
SFD-170	SF-2-C11					127.3	19.5	FT					2.2	106.5	98	95	P	SG	61
SFD-171	SF-4-C11					126.4	14.8	FT					3.7	110.1	99	95	P	SG	62
SFD-172	SF-4-C11					125.9	15.1	FT					4.0	109.4	98	95	P	SG	63
SFD-173	SF-4-C11					123.6	15.0	FT					3.9	107.5	96	95	P	SG	64
SFD-174	SF-4-C11					125.9	14.2	FT					3.1	110.2	99	95	P	SG	65
SFD-175	SF-1-C11					131.9	15.2	FT					0.7	114.5	100	95	P	SG	49

Proctor Curve No. SF-4-C11	Maximum Dry Density PCF 111.5	Optimum Moisture % 11.1
CLSP-2-C12	105.7	18.0
SF-2-C11	108.7	17.3
SF-1-C11	114.5	14.5

Technician: TED STILES  
Date: 1/14/2008  
Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
SFD-176	SF-4-C11					124.4	12.7	FT					1.6	110.4	99	95	P	SG	48
SFD-177	SF-1-C11					132.1	14.8	FT					0.3	115.1	100	95	P	SG	47
SFD-178	SF-4-C11					119.9	10.3	FT					-0.8	108.7	97	95	P	SG	46
SFD-179	SF-4-C11					122.3	14.5	FT					3.4	106.8	96	95	P	SG	45
SFD-180	SF-4-C11					122.9	13.7	FT					2.6	108.1	97	95	P	SG	44
SFD-181	SF-4-C11					118.9	12.8	FT					1.7	105.4	95	95	P	SG	43

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %
SF-4-C11	111.5	11.1
SF-1-C11	114.5	14.5
_____	_____	_____
_____	_____	_____

Technician: TED STILES

Date: 1/14/2008

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
CALIBRATION	SF-4-C11	5.41	1.37	4.04	121.3			FT	200	177.6	22.4	12.6		107.7					
SFD-182	SF-4-C11					120.7	12.5	FT					1.4	107.3	96	95	P	SG	28
SFD-183	SF-4-C11					127.3	15.1	FT					4.0	110.6	99	95	P	SG	29
SFD-184	SF-1-C11					131.4	14.4	FT					-0.1	114.9	100	95	P	SG	30
SFD-185	SF-4-C11					127.2	9.5	FT					-1.6	116.2	104	95	P	SG	31
SFD-186	SF-4-C11					121.4	10.6	FT					-0.5	109.8	98	95	P	SG	32
SFD-187	SF-4-C11					118.3	11.6	FT					0.5	106.0	95	95	P	SG	33
SFD-188	CLSP-2-C12	5.50	1.37	4.13	124.0			FT	200	165.6	34.4	20.8	2.8	102.7	97	95	P	-6.0	4
SFD-189	CLSP-2-C12	5.49	1.39	4.10	123.1			FT	200	164.3	35.7	21.7	3.7	101.1	96	95	P	-4.0	7
SFD-190	SF-4-C11					120.6	9.3	FT					-1.8	110.3	99	95	P	SG	14

Proctor Curve No. SF-4-C11	Maximum Dry Density PCF 111.5	Optimum Moisture % 11.1
CLSP-2-C12	105.7	18.0
SF-1-C11	114.5	14.5

Technician: TED STILES  
Date: 1/15/2008  
Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
SFD-191	SF-1-C11					129.5	13.2	FT					-1.3	114.4	100	95	P	SG	15
SFD-192	SF-4-C11					120.6	11.6	FT					0.5	108.1	97	95	P	SG	16
SFD-193	SF-4-C11					117.9	7.7	FT					-3.4	109.5	98	95	P	SG	17
SFD-194	SF-4-C11					119.1	9.9	FT					-1.2	108.4	97	95	P	SG	18
SFD-195	SF-4-C11					118.9	7.5	FT					-3.6	110.6	99	95	P	SG	19
SFD-196	CLSP-2-C12	5.53	1.37	4.16	124.9			FT	200	164.1	35.9	21.9	3.9	102.5	97	95	P	-9.0	K
SFD-197	CLSP-2-C12	5.50	1.39	4.11	123.4			FT	200	165.2	34.8	21.1	3.1	101.9	96	95	P	-8.0	N

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %
SF-4-C11	111.5	11.1
CLSP-2-C12	105.7	18.0
SF-1-C11	114.5	14.5

Technician: TED STILES  
Date: 1/15/2008  
Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-198	SF-4-C11	5.43	1.37	4.06	121.9	FT	200	174.4	25.6	14.7	3.6	106.3	95	95	P	-6	3	
SFD-199	SF-4-C11	5.42	1.39	4.03	121.0	FT	200	175.2	24.8	14.2	3.1	106.0	95	95	P	-5	6	
SFD-200	SF-4-C11	5.35	1.37	3.98	119.5	FT	200	178.7	21.3	11.9	0.8	106.8	96	95	P	-3	4	
SFD-201	SF-4-C11	5.41	1.39	4.02	120.7	FT	200	176.7	23.3	13.2	2.1	106.7	96	95	P	-10	2	
SFD-202	SF-4-C11	5.49	1.37	4.12	123.7	FT	200	176.4	23.6	13.4	2.3	109.1	98	95	P	-3	5	
SFD-203	SF-4-C11	5.42	1.39	4.03	121.0	FT	200	179.8	20.2	11.2	0.1	108.8	98	95	P	-4	1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/16/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-204	SF-4-C11	5.52	1.37	4.15	124.6	FT	200	174.4	25.6	14.7	3.6	108.7	97	95	P	-10	X	
SFD-205	SF-4-C11	5.57	1.39	4.18	125.5	FT	200	175.0	25.0	14.3	3.2	109.8	99	95	P	-14	L	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/18/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-206	SF-4-C11	5.46	1.37	4.09	122.8	FT	200	175.6	24.4	13.9	2.8	107.8	97	95	P	-6	C	
SFD-207	SF-4-C11	5.52	1.39	4.13	124.0	FT	200	176.7	23.3	13.2	2.1	109.6	98	95	P	-16	N	

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician <u>TED STILES</u>
			Date <u>1/19/2008</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-208	CLSP-2-C12	5.51	1.37	4.14	124.3	FT	200	166.0	34.0	20.5	2.5	103.2	98	95	P	-11	E	
SFD-209	CLSP-2-C12	5.58	1.39	4.19	125.8	FT	200	164.9	35.1	21.3	3.3	103.7	98	95	P	-14	M	
SFD-210	CLSP-2-C12	5.48	1.37	4.11	123.4	FT	200	165.4	34.6	20.9	2.9	102.1	97	95	P	-9	K	
SFD-211	CLSP-2-C12	5.46	1.39	4.07	122.2	FT	200	166.3	33.7	20.3	2.3	101.6	96	95	P	-8	X	

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>1/21/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-212	SF-4-C11	5.42	1.37	4.05	121.6	FT	200	174.3	25.7	14.7	3.6	106.0	95	95	P	-6	I	
SFD-213	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	174.3	25.7	14.7	3.6	106.3	95	95	P	-8	Y	
SFD-214	SF-4-C11	5.41	1.37	4.04	121.3	FT	200	176.7	23.3	13.2	2.1	107.2	96	95	P	SG	3	
SFD-215	SF-4-C11	5.38	1.39	3.99	119.8	FT	200	176.2	23.8	13.5	2.4	105.6	95	95	P	SG	4	
SFD-216	SF-4-C11	5.38	1.37	4.01	120.4	FT	200	177.1	22.9	12.9	1.8	106.6	96	95	P	SG	5	
SFD-217	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	175.0	25.0	14.3	3.2	107.7	97	95	P	SG	6	
SFD-218	SF-4-C11	5.46	1.37	4.09	122.8	FT	200	173.9	26.1	15.0	3.9	106.8	96	95	P	SG	7	
SFD-219	SF-4-C11	5.43	1.39	4.04	121.3	FT	200	175.9	24.1	13.7	2.6	106.7	96	95	P	SG	8	
SFD-220	SF-4-C11	5.42	1.37	4.05	121.6	FT	200	177.3	22.7	12.8	1.7	107.8	97	95	P	SG	1	
SFD-221	SF-4-C11	5.41	1.39	4.02	120.7	FT	200	175.6	24.4	13.9	2.8	106.0	95	95	P	SG	2	

Proctor Curve No. SF-4-C11	Maximum Dry Density PCF 111.5	Optimum Moisture % 11.1	Technician	TED STILES
			Date	1/22/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-222	SF-4-C11	5.39	1.37	4.02	120.7	FT	200	176.7	23.3	13.2	2.1	106.7	96	95	P	-12	L	
SFD-223	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	175.7	24.3	13.8	2.7	108.2	97	95	P	-12	D	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/22/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-224	SF-4-C11	5.39	1.37	4.02	120.7	FT	200	175.4	24.6	14.0	2.9	105.9	95	95	P	-5	J	
SFD-225	SF-4-C11	5.43	1.39	4.04	121.3	FT	200	175.7	24.3	13.8	2.7	106.6	96	95	P	-10	L	
SFD-226	SF-4-C11	5.45	1.37	4.08	122.5	FT	200	174.2	25.8	14.8	3.7	106.7	96	95	P	-24	T1	
SFD-227	SF-4-C11	5.46	1.39	4.07	122.2	FT	200	176.2	23.8	13.5	2.4	107.7	97	95	P	-25	M1	
SFD-228	SF-4-C11	5.41	1.37	4.04	121.3	FT	200	175.1	24.9	14.2	3.1	106.2	95	95	P	-5	C	
SFD-229	SF-4-C11	5.38	1.39	3.99	119.8	FT	200	177.9	22.1	12.4	1.3	106.6	96	95	P	-12	O	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/23/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-230	CLSP-2-C12	5.50	1.37	4.13	124.0	FT	200	164.9	35.1	21.3	3.3	102.3	97	95	P	-4	J	
SFD-231	CLSP-2-C12	5.47	1.39	4.08	122.5	FT	200	165.4	34.6	20.9	2.9	101.3	96	95	P	-4	C	
SFD-232	CLSP-2-C12	5.49	1.37	4.12	123.7	FT	200	165.7	34.3	20.7	2.7	102.5	97	95	P	-7	K	
SFD-233	CLSP-2-C12	5.49	1.39	4.10	123.1	FT	200	166.8	33.2	19.9	1.9	102.7	97	95	P	-9	N	

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1/24/2008</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-234	SF-4-C11	5.48	1.37	4.11	123.4	FT	200	174.5	25.5	14.6	3.5	107.7	97	95	P	-5	50	
SFD-235	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	175.3	24.7	14.1	3.0	106.9	96	95	P	-22	N1	
SFD-236	SF-4-C11	5.45	1.37	4.08	122.5	FT	200	174.4	25.6	14.7	3.6	106.8	96	95	P	-23	68	
SFD-237	SF-4-C11	5.44	1.39	4.05	121.6	FT	200	174.1	25.9	14.9	3.8	105.9	95	95	P	-8	O1	
SFD-238	SF-4-C11	5.49	1.37	4.12	123.7	FT	200	175.6	24.4	13.9	2.8	108.6	97	95	P	-6	Y	
SFD-239	SF-4-C11	5.44	1.39	4.05	121.6	FT	200	177.3	22.7	12.8	1.7	107.8	97	95	P	-8	M	
SFD-240	TP-5-C9	5.36	1.37	3.99	119.8	FT	200	160.8	39.2	24.4	2.9	96.3	97	95	P	-21	T1	
SFD-241	TP-5-C9	5.35	1.39	3.96	118.9	FT	200	159.7	40.3	25.2	3.7	95.0	96	95	P	-21	N1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	1/25/2008
TP-5-C9	99.2	21.5	Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-242	SF-4-C11	5.51	1.37	4.14	124.3	FT	200	174.2	25.8	14.8	3.7	108.3	97	95	P	-19	T1	
SFD-243	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	174.5	25.5	14.6	3.5	106.4	95	95	P	-22	S1	
SFD-244	SF-4-C11	5.44	1.37	4.07	122.2	FT	200	175.3	24.7	14.1	3.0	107.1	96	95	P	-12	O1	
SFD-245	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	174.4	25.6	14.7	3.6	107.4	96	95	P	-22	M1	

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>2/2/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-246	SF-4-C11	5.50	1.37	4.13	124.0	FT	200	174.5	25.5	14.6	3.5	108.2	97	95	P	-16	9	
SFD-247	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	175.1	24.9	14.2	3.1	106.7	96	95	P	-20	41	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	2/3/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-248	SF-4-C11	5.45	1.37	4.08	122.5	FT	200	177.5	22.5	12.7	1.6	108.7	98	95	P	SG	L1	
SFD-249	SF-4-C11	5.59	1.39	4.20	126.1	FT	200	176.1	23.9	13.6	2.5	111.1	100	95	P	SG	E1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	2/5/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-250	SF-4-C11	5.55	1.37	4.18	125.5	FT	200	177.1	22.9	12.9	1.8	111.2	100	95	P	SG	F1	
SFD-251	SF-4-C11	5.53	1.39	4.14	124.3	FT	200	178.2	21.8	12.2	1.1	110.8	99	95	P	-2	X	
SFD-252	SF-4-C11	5.51	1.37	4.14	124.3	FT	200	177.3	22.7	12.8	1.7	110.2	99	95	P	SG	W	
SFD-253	SF-4-C11	5.44	1.39	4.05	121.6	FT	200	179.2	20.8	11.6	0.5	109.0	98	95	P	-3	K	
SFD-254	SF-4-C11	5.53	1.37	4.16	124.9	FT	200	175.7	24.3	13.8	2.7	109.7	98	95	P	-16	P	
SFD-255	SF-4-C11	5.50	1.39	4.11	123.4	FT	200	177.6	22.4	12.6	1.5	109.6	98	95	P	-16	G1	

Proctor Curve No. <u>SF-4-C11</u>	Maximum Dry Density PCF <u>111.5</u>	Optimum Moisture % <u>11.1</u>	Technician <u>TED STILES</u>
			Date <u>2/6/2008</u>
			Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-256	SF-4-C11	5.55	1.37	4.18	125.5	FT	200	175.7	24.3	13.8	2.7	110.3	99	95	P	-13	P	
SFD-257	SF-4-C11	5.52	1.39	4.13	124.0	FT	200	176.8	23.2	13.1	2.0	109.6	98	95	P	-10	A1	
SFD-258	SF-4-C11	5.48	1.37	4.11	123.4	FT	200	177.9	22.1	12.4	1.3	109.8	98	95	P	-13	G1	
SFD-259	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	177.1	22.9	12.9	1.8	109.0	98	95	P	-18	M1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	2/8/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-260	SF-4-C11	5.47	1.37	4.1	123.1	FT	200	179.1	20.9	11.7	0.6	110.3	99	95	P	-18	67	
SFD-261	SF-4-C11	5.48	1.39	4.09	122.8	FT	200	178.0	22.0	12.4	1.3	109.3	98	95	P	-18	W1	
SFD-262	SF-4-C11	5.52	1.37	4.15	124.6	FT	200	177.3	22.7	12.8	1.7	110.5	99	95	P	-19	S1	
SFD-263	SF-4-C11	5.52	1.39	4.13	124.0	FT	200	176.7	23.3	13.2	2.1	109.6	98	95	P	-6	O1	
SFD-264	SF-4-C11	5.47	1.37	4.10	123.1	FT	200	176.4	23.6	13.4	2.3	108.6	97	95	P	-16	68	
SFD-265	SF-4-C11	5.54	1.39	4.15	124.6	FT	200	177.3	22.7	12.8	1.7	110.5	99	95	P	-16	W1	
SFD-266	SF-4-C11	5.52	1.37	4.15	124.6	FT	200	175.9	24.1	13.7	2.6	109.6	98	95	P	-17	51	
SFD-267	SF-4-C11	5.51	1.39	4.12	123.7	FT	200	177.9	22.1	12.4	1.3	110.1	99	95	P	-17	T1	

Proctor Curve No. SF-4-C11	Maximum Dry Density PCF 111.5	Optimum Moisture % 11.1	Technician	TED STILES
			Date	2/11/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-268	SF-4-C11	5.46	1.37	4.09	122.8	FT	200	176.7	23.3	13.2	2.1	108.5	97	95	P	-15	67	
SFD-269	SF-4-C11	5.54	1.39	4.15	124.6	FT	200	176.8	23.2	13.1	2.0	110.2	99	95	P	-16	T1	
SFD-270	SF-4-C11	5.47	1.37	4.10	123.1	FT	200	175.7	24.3	13.8	2.7	108.2	97	95	P	-18	N1	
SFD-271	SF-4-C11	5.42	1.37	4.05	121.6	FT	200	179.1	20.9	11.7	0.6	108.9	98	95	P	-19	H1	
SFD-272	SF-4-C11	5.52	1.39	4.13	124.0	FT	200	176.2	23.8	13.5	2.4	109.3	98	95	P	-14	20	
SFD-273	SF-4-C11	5.44	1.37	4.07	122.2	FT	200	179.5	20.5	11.4	0.3	109.7	98	95	P	-8	A1	
SFD-274	SF-4-C11	5.49	1.39	4.10	123.1	FT	200	178.1	21.9	12.3	1.2	109.6	98	95	P	-11	P	

Proctor Curve No. SF-4-C11	Maximum Dry Density PCF 111.5	Optimum Moisture % 11.1	Technician	TED STILES
			Date	2/12/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-275	SF-4-C11	5.47	1.37	4.1	123.1	FT	200	177.3	22.7	12.8	1.7	109.1	98	95	P	-6	E	
SFD-276	SF-4-C11	5.50	1.39	4.11	123.4	FT	200	178.9	21.1	11.8	0.7	110.4	99	95	P	-8	2	
SFD-277	SF-4-C11	5.56	1.37	4.19	125.8	FT	200	176.5	23.5	13.3	2.2	111.0	100	95	P	-10	P	
SFD-278	SF-4-C11	5.45	1.39	4.06	121.9	FT	200	178.1	21.9	12.3	1.2	108.6	97	95	P	-11	21	
SFD-279	SF-4-C11	5.49	1.37	4.12	123.7	FT	200	177.9	22.1	12.4	1.3	110.1	99	95	P	-6	N	
SFD-280	SF-4-C11	5.50	1.39	4.11	123.4	FT	200	176.4	23.6	13.4	2.3	108.9	98	95	P	-9	9	
SFD-281	SF-4-C11	5.51	1.37	4.14	124.3	FT	200	175.0	25.0	14.3	3.2	108.8	98	95	P	-16	H1	
SFD-282	SF-4-C11	5.55	1.39	4.16	124.9	FT	200	175.6	24.4	13.9	2.8	109.7	98	95	P	-5	34	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	2/14/2007
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-283	SF-4-C11					120.9	11.6	FT						0.5	108.3	97	95	P	-8.0	O
SFD-284	SF-4-C11					122.7	12.4	FT						1.3	109.2	98	95	P	-11.0	Z
SFD-285	SF-4-C11					121.6	12.2	FT						1.1	108.4	97	95	P	-14.0	H1
SFD-286	SF-4-C11					123.6	13.3	FT						2.2	109.1	98	95	P	-4.0	E
SFD-287	SF-4-C11					119.5	11.5	FT						0.4	107.2	96	95	P	-8.0	P
SFD-288	SF-4-C11					122.6	11.8	FT						0.7	109.7	98	95	P	-12.0	G1

Proctor Curve No. SF-4-C11

Maximum Dry Density PCF 111.5

Optimum Moisture % 11.1

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Technician: TED STILES

Date: 2/15/2008

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-289	SF-4-C11					122.1	13.3	FT						2.2	107.8	97	95	P	-9.0	67
SFD-290	SF-4-C11					123.5	12.6	FT						1.5	109.7	98	95	P	-12.0	T1
SFD-291	SF-4-C11					122.7	12.8	FT						1.7	108.8	98	95	P	-10.0	51
SFD-292	SF-4-C11					120.1	11.5	FT						0.4	107.7	97	95	P	-18.0	O1
SFD-293	SF-4-C11					121.6	11.7	FT						0.6	108.9	98	95	P	-4.0	O1
SFD-294	SF-4-C11					120.8	12.4	FT						1.3	107.5	96	95	P	-10.0	21

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician:	<u>TED STILES</u>
<u>SF-4-C11</u>	<u>111.5</u>	<u>11.1</u>	Date:	<u>2/16/2008</u>
_____	_____	_____	Checked By:	<u>JEFF HELVEY, P.E.</u>
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-295	SF-4-C11					121.8	11.2	FT						0.1	109.5	98	95	P	-2.0	O
SFD-296	SF-4-C11					120.5	13.3	FT						2.2	106.4	95	95	P	-4.0	9
SFD-297	SF-4-C11					120.4	13.4	FT						2.3	106.2	95	95	P	-1.0	2
SFD-298	SF-4-C11					123.5	10.1	FT						-1.0	112.2	101	95	P	-3.0	21
SFD-299	SF-4-C11					123.2	10.2	FT						-0.9	111.8	100	95	P	-8.0	68
SFD-300	SF-4-C11					121.6	12.4	FT						1.3	108.2	97	95	P	-11.0	N1

Proctor Curve No. SF-4-C11

Maximum Dry Density PCF 111.5

Optimum Moisture % 11.1

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Technician: TED STILES

Date: 2/17/2008

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-301	SF-4-C11	5.46	1.37	4.09	122.8	FT	200	176.5	23.5	13.3	2.2	108.4	97	95	P	-8	35	
SFD-302	SF-4-C11	5.43	1.39	4.04	121.3	FT	200	179.1	20.9	11.7	0.6	108.6	97	95	P	-6	9	
SFD-303	SF-4-C11	5.39	1.37	4.02	120.7	FT	200	178.2	21.8	12.2	1.1	107.6	96	95	P	-7	68	
SFD-304	SF-4-C11	5.38	1.39	3.99	119.8	FT	200	178.1	21.9	12.3	1.2	106.7	96	95	P	-9	51	
SFD-305	SF-4-C11	5.39	1.37	4.02	120.7	FT	200	178.9	21.1	11.8	0.7	108.0	97	95	P	-6	G1	
SFD-306	SF-4-C11	5.41	1.39	4.02	120.7	FT	200	178.4	21.6	12.1	1.0	107.7	97	95	P	-2	O	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
SF-4-C11	111.5	11.1	Date	2/19/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							% MOIST. +/- OMC (%)
<b>CALIBRATION</b>	<b>SF-4-C11</b>	<b>5.41</b>	<b>1.39</b>	<b>4.02</b>	<b>120.7</b>			<b>FT</b>	<b>200</b>	<b>175.3</b>	<b>24.7</b>	<b>14.1</b>		<b>105.8</b>					
<b>SFD-307</b>	<b>SF-4-C11</b>					<b>120.0</b>	<b>13.4</b>	<b>FT</b>					<b>2.3</b>	<b>105.8</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>-4.0</b>	<b>68</b>
<b>SFD-308</b>	<b>SF-4-C11</b>					<b>120.6</b>	<b>11.4</b>	<b>FT</b>					<b>0.3</b>	<b>108.3</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>-6.0</b>	<b>M1</b>
<b>SFD-309</b>	<b>SF-4-C11</b>					<b>118.8</b>	<b>12.2</b>	<b>FT</b>					<b>1.1</b>	<b>105.9</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>-2.0</b>	<b>Z</b>
<b>SFD-310</b>	<b>SF-4-C11</b>					<b>121.2</b>	<b>12.4</b>	<b>FT</b>					<b>1.3</b>	<b>107.8</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>-5.0</b>	<b>H1</b>
<b>SFD-311</b>	<b>SF-4-C11</b>					<b>119.9</b>	<b>12.5</b>	<b>FT</b>					<b>1.4</b>	<b>106.6</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>-2.0</b>	<b>S1</b>
<b>SFD-312</b>	<b>SF-4-C11</b>					<b>119.7</b>	<b>11.1</b>	<b>FT</b>					<b>0.0</b>	<b>107.7</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>-3.0</b>	<b>51</b>
<b>SFD-313</b>	<b>SF-4-C11</b>					<b>118.1</b>	<b>11.3</b>	<b>FT</b>					<b>0.2</b>	<b>106.1</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>2</b>
<b>SFD-314</b>	<b>SF-4-C11</b>					<b>122.6</b>	<b>12.6</b>	<b>FT</b>					<b>1.5</b>	<b>108.9</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>9</b>
<b>SFD-315</b>	<b>SF-4-C11</b>					<b>119.9</b>	<b>12.0</b>	<b>FT</b>					<b>0.9</b>	<b>107.1</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>SG</b>	<b>20</b>

Proctor Curve No. <b>SF-4-C11</b>	Maximum Dry Density PCF <b>111.5</b>	Optimum Moisture % <b>11.1</b>
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Technician: TED STILES

Date: 2/20/2008

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. SUBGRADE (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-316	SF-4-C11					118.8	11.9	FT						0.8	106.2	95	95	P	SG	21
SFD-317	SF-4-C11					121.2	12.2	FT						1.1	108.0	97	95	P	SG	34
SFD-318	SF-4-C11					120.1	13.3	FT						2.2	106.0	95	95	P	SG	35
SFD-319	SF-4-C11					119.8	11.8	FT						0.7	107.2	96	95	P	SG	50
SFD-320	SF-4-C11					120.2	12.4	FT						1.3	106.9	96	95	P	SG	66
SFD-321	SF-4-C11					121.3	11.7	FT						0.6	108.6	97	95	P	SG	67
SFD-322	SF-4-C11					121.8	12.6	FT						1.5	108.2	97	95	P	SG	51
SFD-323	SF-4-C11					122.1	12.8	FT						1.7	108.2	97	95	P	SG	68

Proctor Curve No. SF-4-C11

Maximum Dry Density PCF 111.5

Optimum Moisture % 11.1

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Technician: TED STILES

Date: 2/20/2008

Checked By: JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: \_\_\_\_\_ 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-324	TP-5-C9	5.24	1.37	3.87	116.2	FT	200	162.3	37.7	23.2	1.7	94.3	95	95	P	-6	U1	
SFD-325	TP-5-C9	5.28	1.39	3.89	116.8	FT	200	163.1	36.9	22.6	1.1	95.3	96	95	P	-5	O1	
SFD-326	TP-5-C9	5.27	1.37	3.90	117.1	FT	200	164.1	35.9	21.9	0.4	96.1	97	95	P	-6	T1	
SFD-327	TP-5-C9	5.36	1.39	3.97	119.2	FT	200	161.6	38.4	23.8	2.3	96.3	97	95	P	-7	N1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/1/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-328	TP-5-C9	5.26	1.37	3.89	116.8	FT	200	161.2	38.8	24.1	2.6	94.2	95	95	P	-3	O	
SFD-329	TP-5-C9	5.34	1.39	3.95	118.6	FT	200	163.1	36.9	22.6	1.1	96.7	98	95	P	-6	Z	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/2/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-330	TP-5-C9	5.29	1.37	3.92	117.7	FT	200	161.8	38.2	23.6	2.1	95.2	96	95	P	-5	P	
SFD-331	TP-5-C9	5.39	1.39	4.00	120.1	FT	200	160.5	39.5	24.6	3.1	96.4	97	95	P	-7	H1	
SFD-332	TP-5-C9	5.22	1.37	3.85	115.6	FT	200	163.4	36.6	22.4	0.9	94.5	95	95	P	-2	E	
SFD-333	TP-5-C9	5.38	1.39	3.99	119.8	FT	200	162.2	37.8	23.3	1.8	97.2	98	95	P	-8	Z	
SFD-334	TP-5-C9	5.25	1.37	3.88	116.5	FT	200	164.2	35.8	21.8	0.3	95.7	96	95	P	-1	D	
SFD-335	TP-5-C9	5.32	1.39	3.93	118.0	FT	200	163.0	37.0	22.7	1.2	96.2	97	95	P	-3	A1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/3/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-336	TP-5-C9	5.30	1.37	3.93	118.0	FT	200	163.5	36.5	22.3	0.8	96.5	97	95	P	SG	W1	
SFD-337	TP-5-C9	5.32	1.39	3.93	118.0	FT	200	162.3	37.7	23.2	1.7	95.8	97	95	P	SG	T1	
SFD-338	TP-5-C9	5.38	1.37	4.01	120.4	FT	200	161.6	38.4	23.8	2.3	97.3	98	95	P	SG	S1	
SFD-339	TP-5-C9	5.24	1.39	3.85	115.6	FT	200	164.1	35.9	21.9	0.4	94.9	96	95	P	SG	N1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/4/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-340	TP-5-C9	5.24	1.37	3.87	116.2	FT	200	162.2	37.8	23.3	1.8	94.3	95	95	P	-1	L	
SFD-341	TP-5-C9	5.36	1.39	3.97	119.2	FT	200	161.0	39.0	24.2	2.7	96.0	97	95	P	-1	N	
SFD-342	TP-5-C9	5.32	1.37	3.95	118.6	FT	200	163.1	36.9	22.6	1.1	96.7	98	95	P	-6	Z	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/9/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-343	TP-5-C9	5.36	1.37	3.99	119.8	FT	200	161.7	38.3	23.7	2.2	96.9	98	95	P	-1	M	
SFD-344	TP-5-C9	5.30	1.39	3.91	117.4	FT	200	162.7	37.3	22.9	1.4	95.5	96	95	P	-3	P	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/10/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-345	TP-5-C9	5.33	1.37	3.96	118.9	FT	200	162.3	37.7	23.2	1.7	96.5	97	95	P	-1	O	
SFD-346	TP-5-C9	5.32	1.39	3.93	118.0	FT	200	161.2	38.8	24.1	2.6	95.1	96	95	P	-4	G1	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
TP-5-C9	99.2	21.5	Date	3/11/2008
			Checked By:	JEFF HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-347	CLSP-3-C12	5.28	1.37	3.91	117.4	FT	200	165.6	34.4	20.8	0.4	97.2	95	95	P	SG	F1
SFD-348	CLSP-3-C12	5.34	1.39	3.95	118.6	FT	200	167.2	32.8	19.6	-0.8	99.2	97	95	P	SG	W
SFD-349	CLSP-3-C12	5.36	1.37	3.99	119.8	FT	200	167.6	32.4	19.3	-1.1	100.4	98	95	P	SG	Y
SFD-350	CLSP-3-C12	5.33	1.39	3.94	118.3	FT	200	166.1	33.9	20.4	0.0	98.3	96	95	P	SG	L

Proctor Curve No. <u>CLSP-3-C12</u>	Maximum Dry Density PCF <u>102.6</u>	Optimum Moisture % <u>20.4</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>4/2/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-351	CLSP-3-C12	5.31	1.37	3.94	118.3	FT	200	169.1	30.9	18.3	-2.1	100.0	98	95	P	SG	O	
SFD-352	CLSP-3-C12	5.37	1.39	3.98	119.5	FT	200	165.4	34.6	20.9	0.5	98.8	96	95	P	SG	G1	
SFD-353	CLSP-3-C12	5.33	1.37	3.96	118.9	FT	200	167.8	32.2	19.2	-1.2	99.8	97	95	P	SG	S1	
SFD-354	CLSP-3-C12	5.42	1.39	4.03	121.0	FT	200	167.4	32.6	19.5	-0.9	101.3	99	95	P	SG	W1	

Proctor Curve No. <u>CLSP-3-C12</u>	Maximum Dry Density PCF <u>102.6</u>	Optimum Moisture % <u>20.4</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>4/3/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION						DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)						
SFD-355	CLSP-3-C12	5.29	1.37	3.92	117.7	FT	200	168.6	31.4	18.6	-1.8	99.2	97	95	P	SG	V1
SFD-356	CLSP-3-C12	5.34	1.39	3.95	118.6	FT	200	166.8	33.2	19.9	-0.5	98.9	96	95	P	SG	D1
SFD-357	CLSP-3-C12	5.23	1.37	3.86	115.9	FT	200	168.9	31.1	18.4	-2.0	97.9	95	95	P	SG	K
SFD-358	CLSP-3-C12	5.38	1.39	3.99	119.8	FT	200	168.2	31.8	18.9	-1.5	100.8	98	95	P	SG	H1

Proctor Curve No. <u>CLSP-3-C12</u>	Maximum Dry Density PCF <u>102.6</u>	Optimum Moisture % <u>20.4</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>4/18/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE  
STRUCTURAL FILL**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				MOISTURE DETERMINATION							DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	DEPTH BELOW SUBGRADE (feet)	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	WEIGHT MOLD (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)	% MOIST. +/- OMC (%)							
SFD-359	CLSP-3-C12	5.41	1.37	4.04	121.3	FT	200	168.5	31.5	18.7	-1.7	102.2	100	95	P	SG	D1	
SFD-360	CLSP-3-C12	5.36	1.39	3.97	119.2	FT	200	169.1	30.9	18.3	-2.1	100.8	98	95	P	SG	L1	
SFD-361	CLSP-3-C12	5.38	1.37	4.01	120.4	FT	200	166.9	33.1	19.8	-0.6	100.5	98	95	P	SG	R1	

Proctor Curve No. <u>CLSP-3-C12</u>	Maximum Dry Density PCF <u>102.6</u>	Optimum Moisture % <u>20.4</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>4/19/2008</u>
_____	_____	_____	Checked By: <u>JEFF HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR CLAY LINER**

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>TP-5</b>	<b>5.42</b>	<b>1.37</b>	<b>4.05</b>	<b>121.6</b>			<b>FT</b>	<b>200</b>	<b>159.5</b>	<b>40.5</b>	<b>25.4</b>	<b>5.5</b>	<b>97.0</b>					
<b>CLD-1</b>	<b>TP-5</b>					<b>122.3</b>	<b>25.4</b>	<b>FT</b>					<b>5.5</b>	<b>97.5</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>36</b>
<b>CLD-2</b>	<b>TP-5</b>					<b>123.2</b>	<b>25.2</b>	<b>FT</b>					<b>5.3</b>	<b>98.4</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>(TP)LP-1-1 22</b>
<b>CLD-3</b>	<b>TP-5</b>					<b>121.7</b>	<b>25.5</b>	<b>FT</b>					<b>5.6</b>	<b>97.0</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>23</b>
<b>CLD-4</b>	<b>TP-5</b>					<b>122.0</b>	<b>25.4</b>	<b>FT</b>					<b>5.5</b>	<b>97.3</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>10</b>
<b>CLD-5</b>	<b>TP-5</b>					<b>123.5</b>	<b>25.3</b>	<b>FT</b>					<b>5.4</b>	<b>98.6</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>24</b>
<b>CLD-6</b>	<b>TP-5</b>					<b>122.9</b>	<b>25.4</b>	<b>FT</b>					<b>5.5</b>	<b>98.0</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>11</b>
<b>CLD-7</b>	<b>TP-5</b>					<b>122.5</b>	<b>26.3</b>	<b>FT</b>					<b>6.4</b>	<b>97.0</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-2 25</b>
<b>CLD-8</b>	<b>TP-5</b>					<b>122.8</b>	<b>25.3</b>	<b>FT</b>					<b>5.4</b>	<b>98.0</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>12</b>
<b>CLD-9</b>	<b>CLSP-2-C12</b>					<b>126.3</b>	<b>22.5</b>	<b>FT</b>					<b>4.5</b>	<b>103.1</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>26</b>

Proctor Curve No. <u>TP-5-C11</u>	Maximum Dry Density PCF <u>100.1</u>	Optimum Moisture % <u>19.9</u>	Technician <u>TED STILES</u>
<u>CLSP-2-C12</u>	<u>105.7</u>	<u>18.0</u>	Date <u>1-26-08</u>
_____	_____	_____	Checked By: <u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____	

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-10	TP-5					123.1	26.4	FT					6.5	97.4	97	95	P	1	LP-1-3 13
CLD-11	TP-5					122.6	26.7	FT					6.8	96.8	97	95	P	1	27

Proctor Curve No. <u>TP-5-C11</u>	Maximum Dry Density PCF <u>100.1</u>	Optimum Moisture % <u>19.9</u>	Technician <u>TED STILES</u>
			Date <u>1-26-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.62</b>	<b>1.37</b>	<b>4.25</b>	<b>127.6</b>			<b>FT</b>	<b>200</b>	<b>161.0</b>	<b>39.0</b>	<b>24.2</b>	<b>6.2</b>	<b>102.7</b>					
<b>CLD-12</b>	<b>CLSP-2-C12</b>					<b>126.4</b>	<b>24.3</b>	<b>FT</b>					<b>6.3</b>	<b>101.7</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>28</b>
<b>CLD-13</b>	<b>CLSP-2-C12</b>					<b>125.4</b>	<b>23.5</b>	<b>FT</b>					<b>5.5</b>	<b>101.5</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>14</b>
<b>CLD-14</b>	<b>CLSP-2-C12</b>					<b>127.2</b>	<b>23.0</b>	<b>FT</b>					<b>5.0</b>	<b>103.4</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>3</b>
<b>CLD-15</b>	<b>CLSP-2-C12</b>					<b>127.8</b>	<b>22.2</b>	<b>FT</b>					<b>4.2</b>	<b>104.6</b>	<b>99</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-4 29</b>
<b>CLD-16</b>	<b>CLSP-2-C12</b>					<b>128.2</b>	<b>23.9</b>	<b>FT</b>					<b>5.9</b>	<b>103.5</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>15</b>
<b>CLD-17</b>	<b>CLSP-2-C12</b>					<b>126.5</b>	<b>23.9</b>	<b>FT</b>					<b>5.9</b>	<b>102.1</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>4</b>
<b>CLD-18</b>	<b>CLSP-2-C12</b>					<b>127.1</b>	<b>23.6</b>	<b>FT</b>					<b>5.6</b>	<b>102.8</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>30</b>
<b>CLD-19</b>	<b>CLSP-2-C12</b>					<b>127.2</b>	<b>24.2</b>	<b>FT</b>					<b>6.2</b>	<b>102.4</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>16</b>
<b>CLD-20</b>	<b>CLSP-2-C12</b>					<b>128.9</b>	<b>22.9</b>	<b>FT</b>					<b>4.9</b>	<b>104.9</b>	<b>99</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-5 5</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1-27-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-21	CLSP-2-C12					129.0	23.1	FT					5.1	104.8	99	95	P	1	17
CLD-22	CLSP-2-C12					128.9	23.6	FT					5.6	104.3	99	95	P	1	6
CLD-23	CLSP-2-C12					127.6	23.2	FT					5.2	103.6	98	95	P	1	LP-1-6 18
CLD-24	CLSP-2-C12					128.5	22.4	FT					4.4	105.0	99	95	P	1	7
CLD-25	CLSP-2-C12					126.0	24.8	FT					6.8	101.0	96	95	P	1	1
CLD-26	CLSP-2-C12					127.3	21.2	FT					3.2	105.0	99	95	P	1	19
CLD-27	CLSP-2-C12					127.9	21.0	FT					3.0	105.7	100	95	P	1	8
CLD-28	CLSP-2-C12					125.6	22.5	FT					4.5	102.5	97	95	P	1	58
CLD-29	CLSP-2-C12					127.5	21.1	FT					3.1	105.3	100	95	P	1	LP-1-7 42

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date Checked By:	TED STILES  1-27-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.49</b>	<b>1.37</b>	<b>4.12</b>	<b>123.7</b>			<b>FT</b>	<b>200</b>	<b>158.5</b>	<b>41.5</b>	<b>26.2</b>	<b>8.2</b>	<b>98.1</b>					
<b>CLD-30</b>	<b>CLSP-2-C12</b>					<b>124.0</b>	<b>25.1</b>	<b>FT</b>					<b>7.1</b>	<b>99.1</b>	<b>94</b>	<b>95</b>	<b>F</b>	<b>1</b>	<b>57</b>
<b>CLD-31</b>	<b>CLSP-2-C12</b>					<b>125.7</b>	<b>24.8</b>	<b>FT</b>					<b>6.8</b>	<b>100.7</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>41</b>
<b>CLD-32</b>	<b>CLSP-2-C12</b>					<b>126.1</b>	<b>23.7</b>	<b>FT</b>					<b>5.7</b>	<b>101.9</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-8 56</b>
<b>CLD-33</b>	<b>CLSP-2-C12</b>					<b>125.4</b>	<b>25.0</b>	<b>FT</b>					<b>7.0</b>	<b>100.3</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>40</b>
<b>CLD-34</b>	<b>CLSP-2-C12</b>					<b>126.7</b>	<b>21.9</b>	<b>FT</b>					<b>3.9</b>	<b>103.9</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>55</b>
<b>CLD-35</b>	<b>CLSP-2-C12</b>					<b>126.1</b>	<b>24.9</b>	<b>FT</b>					<b>6.9</b>	<b>101.0</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>39</b>
<b>CLD-36</b>	<b>CLSP-2-C12</b>					<b>124.0</b>	<b>23.0</b>	<b>FT</b>					<b>5.0</b>	<b>100.8</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>54</b>
<b>CLD-37</b>	<b>CLSP-2-C12</b>					<b>126.9</b>	<b>21.3</b>	<b>FT</b>					<b>3.3</b>	<b>104.6</b>	<b>99</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-9 38</b>
<b>CLD-30R</b>	<b>CLSP-2-C12</b>					<b>125.9</b>	<b>25.0</b>	<b>FT</b>					<b>7.0</b>	<b>100.7</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>57</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1-28-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-38	CLSP-2-C12					126.5	24.3	FT					6.3	101.8	96	95	P	1	53
CLD-39	CLSP-2-C12					126.1	23.7	FT					5.7	101.9	96	95	P	1	37
CLD-40	CLSP-2-C12					126.0	23.8	FT					5.8	101.8	96	95	P	1	LP-1-10 52
CLD-41	CLSP-2-C12					126.8	24.6	FT					6.6	101.8	96	95	P	1	59
CLD-42	CLSP-2-C12					125.5	21.8	FT					3.8	103.0	97	95	P	1	43

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date Checked By:	TED STILES  1-28-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.54</b>	<b>1.37</b>	<b>4.17</b>	<b>125.2</b>			<b>FT</b>	<b>200</b>	<b>160.5</b>	<b>39.5</b>	<b>24.6</b>	<b>6.6</b>	<b>100.5</b>					
<b>CLD-43</b>	<b>CLSP-2-C12</b>					<b>126.2</b>	<b>24.2</b>	<b>FT</b>					<b>6.2</b>	<b>101.6</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-11 60</b>
<b>CLD-44</b>	<b>CLSP-2-C12</b>					<b>127.8</b>	<b>22.4</b>	<b>FT</b>					<b>4.4</b>	<b>104.4</b>	<b>99</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>44</b>
<b>CLD-45</b>	<b>CLSP-2-C12</b>					<b>126.2</b>	<b>23.8</b>	<b>FT</b>					<b>5.8</b>	<b>101.9</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>61</b>
<b>CLD-46</b>	<b>CLSP-2-C12</b>					<b>127.3</b>	<b>24.6</b>	<b>FT</b>					<b>6.6</b>	<b>102.2</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>45</b>
<b>CLD-47</b>	<b>CLSP-2-C12</b>					<b>128.9</b>	<b>22.2</b>	<b>FT</b>					<b>4.2</b>	<b>105.5</b>	<b>100</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>62</b>
<b>CLD-48</b>	<b>CLSP-2-C12</b>					<b>129.3</b>	<b>24.2</b>	<b>FT</b>					<b>6.2</b>	<b>104.1</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-12 46</b>
<b>CLD-49</b>	<b>CLSP-2-C12</b>					<b>127.1</b>	<b>23.8</b>	<b>FT</b>					<b>5.8</b>	<b>102.7</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>31</b>
<b>CLD-50</b>	<b>CLSP-2-C12</b>					<b>128.1</b>	<b>25.0</b>	<b>FT</b>					<b>7.0</b>	<b>102.5</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>47</b>
<b>CLD-51</b>	<b>CLSP-2-C12</b>					<b>127.6</b>	<b>24.1</b>	<b>FT</b>					<b>6.1</b>	<b>102.8</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>32</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1-29-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-52	CLSP-2-C12					126.6	24.6	FT					6.6	101.6	96	95	P	2	57
CLD-53	CLSP-2-C12					125.7	24.3	FT					6.3	101.1	96	95	P	2	56
CLD-54	CLSP-2-C12					126.5	23.7	FT					5.7	102.3	97	95	P	2	(TP)LP-2-1 55
CLD-55	CLSP-2-C12					126.3	24.7	FT					6.7	101.3	96	95	P	2	54
CLD-56	CLSP-2-C12					124.9	25.5	FT					7.5	99.5	94	95	F	2	53
CLD-57	CLSP-2-C12					126.0	24.9	FT					6.9	100.9	95	95	P	2	52
CLD-56R	CLSP-2-C12					126.8	24.3	FT					6.3	102.0	97	95	P	2	53
CLD-58	CLSP-2-C12					126.8	23.0	FT					5.0	103.1	98	95	P	2	40
CLD-59	CLSP-2-C12					126.4	23.6	FT					5.6	102.3	97	95	P	2	38
CLD-60	CLSP-2-C12					127.3	24.9	FT					6.9	101.9	96	95	P	2	LP-2-2 41

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  TED STILES
_____	_____	_____	Date  1-29-08
_____	_____	_____	Checked By:  JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-61	CLSP-2-C12					126.3	25.4	FT					7.4	100.7	95	95	P	2	39
CLD-62	CLSP-2-C12					125.5	23.9	FT					5.9	101.3	96	95	P	2	LP-2-3 37
CLD-63	CLSP-2-C12					126.4	24.2	FT					6.2	101.8	96	95	P	2	36
CLD-64	CLSP-2-C12					126.9	23.4	FT					5.4	102.8	97	95	P	2	22
CLD-65	CLSP-2-C12					125.8	25.0	FT					7.0	100.6	95	95	P	2	23
CALIBRATION TEST	CLSP-2-C12	5.57	1.37	4.20	126.1			FT	200	161.0	39.0	24.2	24.2	101.5					

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date Checked By:	TED STILES  1-29-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.54</b>	<b>1.37</b>	<b>4.17</b>	<b>125.2</b>			<b>FT</b>	<b>200</b>	<b>162.9</b>	<b>37.1</b>	<b>22.8</b>	<b>4.8</b>	<b>102.0</b>					
<b>CLD-66</b>	<b>CLSP-2-C12</b>					<b>125.4</b>	<b>22.8</b>	<b>FT</b>					<b>4.8</b>	<b>102.1</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>24</b>
<b>CLD-67</b>	<b>CLSP-2-C12</b>					<b>124.1</b>	<b>21.9</b>	<b>FT</b>					<b>3.9</b>	<b>101.8</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-2-4 10</b>
<b>CLD-68</b>	<b>CLSP-2-C12</b>					<b>125.5</b>	<b>24.4</b>	<b>FT</b>					<b>6.4</b>	<b>100.9</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>25</b>
<b>CLD-69</b>	<b>CLSP-2-C12</b>					<b>125.3</b>	<b>23.0</b>	<b>FT</b>					<b>5.0</b>	<b>101.9</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>11</b>
<b>CLD-70</b>	<b>CLSP-2-C12</b>					<b>125.4</b>	<b>24.8</b>	<b>FT</b>					<b>6.8</b>	<b>100.5</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>26</b>
<b>CLD-71</b>	<b>CLSP-2-C12</b>					<b>126.4</b>	<b>25.3</b>	<b>FT</b>					<b>7.3</b>	<b>100.9</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-2-5 12</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1-30-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.51</b>	<b>1.37</b>	<b>4.14</b>	<b>124.3</b>			<b>FT</b>	<b>200</b>	<b>162.1</b>	<b>37.9</b>	<b>23.4</b>	<b>5.4</b>	<b>100.8</b>					
<b>CLD-72</b>	<b>CLSP-2-C12</b>					<b>124.4</b>	<b>23.8</b>	<b>FT</b>					<b>5.8</b>	<b>100.5</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>(TP)LP-3-1 57</b>
<b>CLD-73</b>	<b>CLSP-2-C12</b>					<b>125.1</b>	<b>22.6</b>	<b>FT</b>					<b>4.6</b>	<b>102.0</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>55</b>
<b>CLD-74</b>	<b>CLSP-2-C12</b>					<b>125.6</b>	<b>22.9</b>	<b>FT</b>					<b>4.9</b>	<b>102.2</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>LP-3-2 53</b>
<b>CLD-75</b>	<b>CLSP-2-C12</b>					<b>125.8</b>	<b>21.5</b>	<b>FT</b>					<b>3.5</b>	<b>103.5</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>56</b>
<b>CLD-76</b>	<b>CLSP-2-C12</b>					<b>124.0</b>	<b>22.5</b>	<b>FT</b>					<b>4.5</b>	<b>101.2</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>LP-3-3 54</b>
<b>CLD-77</b>	<b>CLSP-2-C12</b>					<b>126.1</b>	<b>21.7</b>	<b>FT</b>					<b>3.7</b>	<b>103.6</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>52</b>
<b>CLD-78</b>	<b>CLSP-2-C12</b>					<b>126.0</b>	<b>22.6</b>	<b>FT</b>					<b>4.6</b>	<b>102.8</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>41</b>
<b>CLD-79</b>	<b>CLSP-2-C12</b>					<b>124.1</b>	<b>22.6</b>	<b>FT</b>					<b>4.6</b>	<b>101.2</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>40</b>
<b>CLD-80</b>	<b>CLSP-2-C12</b>					<b>125.4</b>	<b>22.6</b>	<b>FT</b>					<b>4.6</b>	<b>102.3</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>3</b>	<b>39</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1-31-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-81	CLSP-2-C12					124.2	23.0	FT					5.0	101.0	96	95	P	3	38
CLD-82	CLSP-2-C12					124.7	22.3	FT					4.3	102.0	96	95	P	3	37
CLD-83	CLSP-2-C12					125.4	22.2	FT					4.2	102.6	97	95	P	3	36
CLD-84	CLSP-2-C12					125.2	22.5	FT					4.5	102.2	97	95	P	3	26
CLD-85	CLSP-2-C12					124.4	22.3	FT					4.3	101.7	96	95	P	3	12
CLD-86	CLSP-2-C12					124.8	23.7	FT					5.7	100.9	95	95	P	3	LP-3-4 11
CLD-87	CLSP-2-C12					125.0	22.7	FT					4.7	101.9	96	95	P	3	25
CLD-88	CLSP-2-C12					124.7	23.0	FT					5.0	101.4	96	95	P	3	24
CLD-89	CLSP-2-C12					125.7	22.3	FT					4.3	102.8	97	95	P	3	23
CLD-90	CLSP-2-C12					124.9	23.4	FT					5.4	101.2	96	95	P	3	LP-3-5 10

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  TED STILES
_____	_____	_____	Date  1-31-08
_____	_____	_____	Checked By:  JEFFREY C. HELVEY, P.E.
_____	_____	_____	

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-91	CLSP-2-C12					125.8	22.6	FT					4.6	102.6	97	95	P	3	22

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>1-31-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.58</b>	<b>1.37</b>	<b>4.21</b>	<b>126.4</b>			<b>FT</b>	<b>200</b>	<b>161.2</b>	<b>38.8</b>	<b>24.1</b>	<b>6.1</b>	<b>101.9</b>					
<b>CLD-92</b>	<b>CLSP-2-C12</b>					<b>126.2</b>	<b>24.1</b>	<b>FT</b>					<b>6.1</b>	<b>101.7</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>63</b>
<b>CLD-93</b>	<b>CLSP-2-C12</b>					<b>127.4</b>	<b>23.8</b>	<b>FT</b>					<b>5.8</b>	<b>102.9</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>64</b>
<b>CLD-94</b>	<b>CLSP-2-C12</b>					<b>125.0</b>	<b>23.0</b>	<b>FT</b>					<b>5.0</b>	<b>101.6</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>48</b>
<b>CLD-95</b>	<b>CLSP-2-C12</b>					<b>123.7</b>	<b>23.5</b>	<b>FT</b>					<b>5.5</b>	<b>100.2</b>	<b>95</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-13 33</b>
<b>CLD-96</b>	<b>CLSP-2-C12</b>					<b>126.6</b>	<b>22.9</b>	<b>FT</b>					<b>4.9</b>	<b>103.0</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>65</b>
<b>CLD-97</b>	<b>CLSP-2-C12</b>					<b>125.9</b>	<b>23.7</b>	<b>FT</b>					<b>5.7</b>	<b>101.8</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>1</b>	<b>LP-1-14 49</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>2-2-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.56</b>	<b>1.37</b>	<b>4.19</b>	<b>125.8</b>			<b>FT</b>	<b>200</b>	<b>160.6</b>	<b>39.4</b>	<b>24.5</b>	<b>6.5</b>	<b>101.0</b>					
<b>CLD-98</b>	<b>CLSP-2-C12</b>					<b>126.2</b>	<b>23.8</b>	<b>FT</b>					<b>5.8</b>	<b>101.9</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>4</b>	<b>(TP)LP-4-1 36</b>
<b>CLD-99</b>	<b>CLSP-2-C12</b>					<b>125.6</b>	<b>22.7</b>	<b>FT</b>					<b>4.7</b>	<b>102.4</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>4</b>	<b>22</b>
<b>CLD-100</b>	<b>CLSP-2-C12</b>					<b>127.0</b>	<b>23.1</b>	<b>FT</b>					<b>5.1</b>	<b>103.2</b>	<b>98</b>	<b>95</b>	<b>P</b>	<b>4</b>	<b>23</b>
<b>CLD-101</b>	<b>CLSP-2-C12</b>					<b>126.9</b>	<b>23.3</b>	<b>FT</b>					<b>5.3</b>	<b>102.9</b>	<b>97</b>	<b>95</b>	<b>P</b>	<b>4</b>	<b>10</b>
<b>CLD-102</b>	<b>CLSP-2-C12</b>					<b>125.3</b>	<b>23.0</b>	<b>FT</b>					<b>5.0</b>	<b>101.9</b>	<b>96</b>	<b>95</b>	<b>P</b>	<b>4</b>	<b>11</b>

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>2-3-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.50</b>	<b>1.37</b>	<b>4.13</b>	<b>124.0</b>			<b>FT</b>	<b>200</b>	<b>161.5</b>	<b>38.5</b>	<b>23.8</b>	<b>5.8</b>	<b>100.1</b>					
CLD-103	CLSP-2-C12					124.5	23.6	FT					5.6	100.7	95	95	P	4	12
CLD-104	CLSP-2-C12					126.1	24.6	FT					6.6	101.2	96	95	P	4	LP-4-2 26
CLD-105	CLSP-2-C12					124.8	24.6	FT					6.6	100.2	95	95	P	4	25
CLD-106	CLSP-2-C12					123.8	23.6	FT					5.6	100.2	95	95	P	4	LP-4-3 24
CLD-107	CLSP-2-C12					125.9	24.9	FT					6.9	100.8	95	95	P	4	41
CLD-108	CLSP-2-C12					125.7	24.6	FT					6.6	100.9	95	95	P	4	LP-4-4 40
CLD-109	CLSP-2-C12					125.0	24.3	FT					6.3	100.6	95	95	P	4	LP-4-5 39
CLD-110	CLSP-2-C12					125.8	23.8	FT					5.8	101.6	96	95	P	4	38
CLD-111	CLSP-2-C12					124.4	24.0	FT					6.0	100.3	95	95	P	4	37

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date 2-4-08	TED STILES
_____	_____	_____	Checked By:	JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-112	CLSP-2-C12					124.6	24.4	FT					6.4	100.2	95	95	P	4	52
CLD-113	CLSP-2-C12					125.1	24.0	FT					6.0	100.9	95	95	P	4	54
CLD-114	CLSP-2-C12					125.9	24.3	FT					6.3	101.3	96	95	P	4	56
CLD-115	CLSP-2-C12					125.0	22.9	FT					4.9	101.7	96	95	P	4	57
CLD-116	CLSP-2-C12					124.4	23.3	FT					5.3	100.9	95	95	P	4	55
CLD-117	CLSP-2-C12					125.3	23.8	FT					5.8	101.2	96	95	P	4	53
CLD-118	CLSP-2-C12					124.2	24.0	FT					6.0	100.2	95	95	P	2	27
CLD-119	CLSP-2-C12					125.0	24.5	FT					6.5	100.4	95	95	P	2	13
CLD-120	CLSP-2-C12					124.8	24.4	FT					6.4	100.3	95	95	P	2	14
CLD-121	CLSP-2-C12					125.0	23.4	FT					5.4	101.3	96	95	P	2	LP-2-6 3

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date Checked By:	TED STILES  2-4-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-122	CLSP-2-C12					124.3	24.0	FT					6.0	100.2	95	95	P	2	15
CLD-123	CLSP-2-C12					124.9	24.7	FT					6.7	100.2	95	95	P	2	4

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>2-4-08</u>
_____	_____	_____	Checked By: <u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____	

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.53</b>	<b>1.37</b>	<b>4.16</b>	<b>124.9</b>			<b>FT</b>	<b>200</b>	<b>163.1</b>	<b>36.9</b>	<b>22.6</b>	<b>4.6</b>	<b>101.9</b>					
CLD-124	CLSP-2-C12					125.2	22.9	FT					4.9	101.9	96	95	P	2	42
CLD-125	CLSP-2-C12					125.6	23.1	FT					5.1	102.0	97	95	P	2	58
CLD-126	CLSP-3-C12					125.2	25.0	FT					4.6	100.2	98	95	P	2	LP-2-7 28
CLD-127	CLSP-3-C12					125.3	24.2	FT					3.8	100.9	98	95	P	2	43
CLD-128	CLSP-3-C12					125.4	24.2	FT					3.8	101.0	98	95	P	2	LP-2-8 59
CLD-129	CLSP-2-C12					126.7	23.1	FT					5.1	102.9	97	95	P	2	29
CLD-130	CLSP-3-C12					125.0	24.8	FT					4.4	100.2	98	95	P	2	44
CLD-131	CLSP-3-C12					125.1	24.7	FT					4.3	100.3	98	95	P	2	60
CLD-132	CLSP-3-C12					125.0	23.9	FT					3.5	100.9	98	95	P	2	30

Proctor Curve No.	Maximum Dry Density	Optimum Moisture	Technician
CLSP-2-C12	PCF	%	<u>TED STILES</u>
	<u>105.7</u>	<u>18.0</u>	Date
CLSP-3-C12	<u>102.6</u>	<u>20.4</u>	<u>2-5-08</u>
			Checked By:
			<u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)								
CLD-133	CLSP-2-C12					126.7	24.6	FT					6.6	101.7	96	95	P	2	LP-2-9 45	
CLD-134	CLSP-2-C12					125.3	23.3	FT					5.3	101.6	96	95	P	2	61	
CLD-135	CLSP-2-C12					125.3	22.5	FT					4.5	102.3	97	95	P	2	LP-2-10 16	
CLD-136	CLSP-3-C12					125.2	24.0	FT					3.6	101.0	98	95	P	2	5	

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>CLSP-2-C12</u>	<u>105.7</u>	<u>18.0</u>	Date	<u>2-5-08</u>
<u>CLSP-3-C12</u>	<u>102.6</u>	<u>20.4</u>	Checked By:	<u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-3-C12</b>	<b>5.47</b>	<b>1.37</b>	<b>4.10</b>	<b>123.1</b>			<b>FT</b>	<b>200</b>	<b>159.6</b>	<b>40.4</b>	<b>25.3</b>	<b>4.9</b>	<b>98.3</b>					
CLD-137	CLSP-3-C12					122.9	25.0	FT					4.6	98.3	96	95	P	2	62
CLD-138	CLSP-3-C12					123.1	25.7	FT					5.3	97.9	95	95	P	2	46
CLD-139	CLSP-3-C12					123.0	24.6	FT					4.2	98.7	96	95	P	2	LP-2-11 31
CLD-140	CLSP-2-C12					125.3	23.7	FT					5.7	101.3	96	95	P	2	17
CLD-141	CLSP-2-C12					125.1	22.5	FT					4.5	102.1	97	95	P	2	6
CLD-142	CLSP-2-C12					124.3	23.6	FT					5.6	100.6	95	95	P	2	LP-2-12 63
CLD-143	CLSP-3-C12					123.3	25.8	FT					5.4	98.0	96	95	P	2	47
CLD-144	CLSP-3-C12					126.5	23.2	FT					2.8	102.7	100	95	P	2	32
CLD-145	CLSP-2-C12					125.2	22.4	FT					4.4	102.3	97	95	P	2	18

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician
CLSP-2-C12	105.7	18.0	TED STILES
CLSP-3-C12	102.6	20.4	Date
			2-6-08
			Checked By:
			JEFFREY C. HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-146	CLSP-2-C12					125.0	22.3	FT					4.3	102.2	97	95	P	2	LP-2-13 7
CLD-147	CLSP-2-C12					125.5	22.4	FT					4.4	102.5	97	95	P	2	1
CLD-148	CLSP-3-C12					122.5	23.4	FT					3.0	99.3	97	95	P	2	LP-2-14 64
CLD-149	CLSP-3-C12					122.4	23.8	FT					3.4	98.9	96	95	P	2	48
CLD-150	CLSP-2-C12					124.7	23.0	FT					5.0	101.4	96	95	P	2	33
CLD-151	CLSP-3-C12					122.2	22.6	FT					2.2	99.7	97	95	P	2	19
CLD-152	CLSP-2-C12					124.8	21.9	FT					3.9	102.4	97	95	P	2	8
CLD-153	CLSP-3-C12					123.2	23.1	FT					2.7	100.1	98	95	P	2	2
CLD-154	CLSP-3-C12					123.5	25.6	FT					5.2	98.3	96	95	P	2	65
CLD-155	CLSP-3-C12					123.7	23.3	FT					2.9	100.3	98	95	P	2	49

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	TED STILES
CLSP-2-C12	105.7	18.0	Date	2-6-08
CLSP-3-C12	102.6	20.4	Checked By:	JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-156	CLSP-3-C12					124.2	25.2	FT					4.8	99.2	97	95	P	2	34
CLD-157	CLSP-3-C12					123.3	25.7	FT					5.3	98.1	96	95	P	2	LP-2-15 66

Proctor Curve No. CLSP-3-C12	Maximum Dry Density PCF 102.6	Optimum Moisture % 20.4	Technician  Date Checked By:	TED STILES  2-6-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333



**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-167	CLSP-3-C12					125.7	23.7	FT					3.3	101.6	99	95	P	3	4
CLD-168	CLSP-2-C12					124.7	22.3	FT					4.3	102.0	96	95	P	3	LP-3-8 15
CLD-169	CLSP-3-C12					124.0	23.5	FT					3.1	100.4	98	95	P	3	29
CLD-170	CLSP-3-C12					123.8	23.3	FT					2.9	100.4	98	95	P	3	44
CLD-171	CLSP-3-C12					125.0	24.3	FT					3.9	100.6	98	95	P	3	60

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>CLSP-2-C12</u>	<u>105.7</u>	<u>18.0</u>	Date	<u>2-7-08</u>
<u>CLSP-3-C12</u>	<u>102.6</u>	<u>20.4</u>	Checked By:	<u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.55</b>	<b>1.39</b>	<b>4.16</b>	<b>124.9</b>			<b>FT</b>	<b>200</b>	<b>164.9</b>	<b>35.1</b>	<b>21.3</b>	<b>3.3</b>	<b>103.0</b>					
CLD-172	CLSP-2-C12					125.2	20.6	FT					2.6	103.8	98	95	P	3	5
CLD-173	CLSP-2-C12					124.3	20.8	FT					2.8	102.9	97	95	P	3	16
CLD-174	CLSP-2-C12					124.3	21.7	FT					3.7	102.1	97	95	P	3	30
CLD-175	CLSP-2-C12					123.2	20.5	FT					2.5	102.2	97	95	P	3	45
CLD-176	CLSP-2-C12					122.4	21.5	FT					3.5	100.7	95	95	P	3	LP-3-9 61
CLD-177	CLSP-2-C12					123.6	20.7	FT					2.7	102.4	97	95	P	3	62
CLD-178	CLSP-2-C12					125.7	21.3	FT					3.3	103.6	98	95	P	3	46
CLD-179	CLSP-2-C12					125.1	20.9	FT					2.9	103.5	98	95	P	3	31
CLD-180	CLSP-2-C12					124.0	21.9	FT					3.9	101.7	96	95	P	3	LP-3-10 17

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
			Date <u>2-8-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-181	CLSP-2-C12					125.6	20.8	FT					2.8	104.0	98	95	P	3	6
CLD-182	CLSP-2-C12					124.0	22.0	FT					4.0	101.6	96	95	P	3	LP-3-11 1
CLD-183	CLSP-2-C12					122.0	21.8	FT					3.8	100.2	95	95	P	3	7
CLD-184	CLSP-2-C12					126.2	20.8	FT					2.8	104.5	99	95	P	3	18
CLD-185	CLSP-2-C12					123.8	21.4	FT					3.4	102.0	96	95	P	3	32
CLD-186	CLSP-2-C12					123.6	21.1	FT					3.1	102.1	97	95	P	3	LP-3-12 47
CLD-187	CLSP-2-C12					124.2	20.2	FT					2.2	103.3	98	95	P	3	63

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date Checked By:	TED STILES  2-8-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-3-C12</b>	<b>5.50</b>	<b>1.39</b>	<b>4.11</b>	<b>123.4</b>			<b>FT</b>	<b>200</b>	<b>160.3</b>	<b>39.7</b>	<b>24.8</b>	<b>4.4</b>	<b>98.9</b>					
CLD-188	CLSP-3-C12					123.3	24.2	FT					3.8	99.3	97	95	P	3	33
CLD-189	CLSP-2-C12					124.2	22.8	FT					4.8	101.1	96	95	P	3	48
CLD-190	CLSP-3-C12					122.7	24.6	FT					4.2	98.5	96	95	P	3	64
CLD-191	CLSP-3-C12					123.1	23.6	FT					3.2	99.6	97	95	P	3	49
CLD-192	CLSP-3-C12					124.8	23.7	FT					3.3	100.9	98	95	P	3	LP-3-13 65
CLD-193	CLSP-3-C12					124.2	24.7	FT					4.3	99.6	97	95	P	3	66
CLD-194	CLSP-2-C12					126.5	22.9	FT					4.9	102.9	97	95	P	3	LP-3-14 19
CLD-195	CLSP-3-C12					123.1	24.1	FT					3.7	99.2	97	95	P	3	8
CLD-196	CLSP-3-C12					124.0	23.4	FT					3.0	100.5	98	95	P	3	2

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
CLSP-2-C12	<u>105.7</u>	<u>18.0</u>	Date	<u>2-9-08</u>
CLSP-3-C12	<u>102.6</u>	<u>20.4</u>	Checked By:	<u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-197	CLSP-2-C12					124.8	22.8	FT					4.8	101.6	96	95	P	3	34

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician  <u>TED STILES</u>
_____	_____	_____	Date  <u>2-9-08</u>
_____	_____	_____	Checked By:  <u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____	

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-3-C12</b>	<b>5.44</b>	<b>1.38</b>	<b>4.06</b>	<b>121.9</b>			<b>FT</b>	<b>200</b>	<b>162.1</b>	<b>37.9</b>	<b>23.4</b>	<b>3.0</b>	<b>98.8</b>					
CLD-198	CLSP-3-C12					123.4	23.3	FT					2.9	100.1	98	95	P	4	13
CLD-199	CLSP-3-C12					124.0	24.4	FT					4.0	99.7	97	95	P	4	27
CLD-200	CLSP-3-C12					122.8	24.3	FT					3.9	98.8	96	95	P	4	42
CLD-201	CLSP-3-C12					122.2	24.6	FT					4.2	98.1	96	95	P	4	LP-4-6 58
CLD-202	CLSP-3-C12					121.9	24.1	FT					3.7	98.2	96	95	P	4	59
CLD-203	CLSP-3-C12					123.2	24.2	FT					3.8	99.2	97	95	P	4	43
CLD-204	CLSP-3-C12					122.4	25.4	FT					5.0	97.6	95	95	P	4	28
CLD-205	CLSP-3-C12					123.0	24.4	FT					4.0	98.9	96	95	P	4	LP-4-7 14
CLD-206	CLSP-3-C12					122.2	25.7	FT					5.3	97.2	95	95	P	4	3

Proctor Curve No. <u>CLSP-3-C12</u>	Maximum Dry Density PCF <u>102.6</u>	Optimum Moisture % <u>20.4</u>	Technician <u>TED STILES</u>
			Date <u>2-15-08</u>
			Checked By: <u>JEFFREY C. HELVEY, P.E.</u>

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-207	CLSP-3-C12					123.1	23.2	FT					2.8	99.9	97	95	P	4	60
CLD-208	CLSP-3-C12					122.2	25.2	FT					4.8	97.6	95	95	P	4	LP-4-8 44
CLD-209	CLSP-3-C12					123.2	25.1	FT					4.7	98.5	96	95	P	4	29
CLD-210	CLSP-3-C12					122.5	24.0	FT					3.6	98.8	96	95	P	4	15
CLD-211	CLSP-3-C12					123.1	25.5	FT					5.1	98.1	96	95	P	4	4

Proctor Curve No. CLSP-3-C12	Maximum Dry Density PCF 102.6	Optimum Moisture % 20.4	Technician  Date Checked By:	TED STILES  2-15-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-3-C12</b>	<b>5.47</b>	<b>1.39</b>	<b>4.08</b>	<b>122.5</b>			<b>FT</b>	<b>200</b>	<b>158.7</b>	<b>41.3</b>	<b>26.0</b>	<b>5.6</b>	<b>97.2</b>					
CLD-212	CLSP-3-C12					123.3	23.5	FT					3.1	99.8	97	95	P	4	5
CLD-213	CLSP-3-C12					125.6	24.0	FT					3.6	101.3	99	95	P	4	16
CLD-214	CLSP-3-C12					124.1	24.6	FT					4.2	99.6	97	95	P	4	LP-4-9 30
CLD-215	CLSP-2-C12					126.0	22.0	FT					4.0	103.3	98	95	P	4	45
CLD-216	CLSP-3-C12					124.0	23.3	FT					2.9	100.6	98	95	P	4	61
CLD-217	CLSP-3-C12					124.8	24.1	FT					3.7	100.6	98	95	P	4	62
CLD-218	CLSP-3-C12					124.2	23.8	FT					3.4	100.3	98	95	P	4	LP-4-10 46
CLD-219	CLSP-2-C12					126.0	21.6	FT					3.6	103.6	98	95	P	4	31
CLD-220	CLSP-2-C12					124.7	21.9	FT					3.9	102.3	97	95	P	4	17

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician
CLSP-2-C12	105.7	18.0	TED STILES
CLSP-3-C12	102.6	20.4	Date
			2-16-08
			Checked By:
			JEFFREY C. HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-221	CLSP-3-C12					123.0	25.5	FT					7.5	98.0	93	95	P	4	LP-4-11 6
CLD-222	CLSP-3-C12					124.0	23.8	FT					3.4	100.2	98	95	P	4	1
CLD-223	CLSP-2-C12					124.5	22.4	FT					4.4	101.7	96	95	P	4	7
CLD-224	CLSP-3-C12					124.4	23.9	FT					3.5	100.4	98	95	P	4	18
CLD-225	CLSP-2-C12					124.2	23.1	FT					5.1	100.9	95	95	P	4	LP-4-12 32
CLD-226	CLSP-2-C12					125.3	23.0	FT					5.0	101.9	96	95	P	4	47
CLD-227	CLSP-2-C12					125.7	22.8	FT					4.8	102.4	97	95	P	4	63

Proctor Curve No.	Maximum Dry Density PCF	Optimum Moisture %	Technician	<u>TED STILES</u>
<u>CLSP-2-C12</u>	<u>105.7</u>	<u>18.0</u>	Date	<u>2-16-08</u>
<u>CLSP-3-C12</u>	<u>102.6</u>	<u>20.4</u>	Checked By:	<u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
<b>CALIBRATION TEST</b>	<b>CLSP-2-C12</b>	<b>5.53</b>	<b>1.39</b>	<b>4.14</b>	<b>124.3</b>			<b>FT</b>	<b>200</b>	<b>158.7</b>	<b>41.3</b>	<b>26.0</b>	<b>8.0</b>	<b>98.7</b>					
CLD-228	CLSP-2-C12					124.6	23.2	FT					5.2	101.1	96	95	P	4	64
CLD-229	CLSP-2-C12					125.6	21.1	FT					3.1	103.7	98	95	P	4	LP-4-13 48
CLD-230	CLSP-2-C12					123.3	22.1	FT					4.1	101.0	96	95	P	4	33
CLD-231	CLSP-3-C12					123.4	25.2	FT					4.8	98.6	96	95	P	4	LP-4-14 19
CLD-232	CLSP-2-C12					125.2	21.8	FT					3.8	102.8	97	95	P	4	8
CLD-233	CLSP-2-C12					124.6	22.4	FT					4.4	101.8	96	95	P	4	49
CLD-234	CLSP-2-C12					122.7	22.5	FT					4.5	100.2	95	95	P	4	65
CLD-235	CLSP-2-C12					123.9	22.4	FT					4.4	101.2	96	95	P	4	66

Proctor Curve No.	Maximum Dry Density	Optimum Moisture	Technician	TED STILES
CLSP-2-C12	PCF	%	Date	2-17-08
CLSP-3-C12	105.7	18.0	Checked By:	JEFFREY C. HELVEY, P.E.
	102.6	20.4		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-236	CLSP-2-C12	5.50	1.37	4.13	124.0			FT	200	164.6	35.4	21.5	3.5	102.1	97	95	P	1	2
CLD-237	CLSP-2-C12	5.54	1.39	4.15	124.6			FT	200	165.4	34.6	20.9	2.9	103.1	98	95	P	1	9
CLD-238	CLSP-2-C12	5.50	1.37	4.13	124.0			FT	200	164.0	36.0	22.0	4.0	101.7	96	95	P	1	LP-1-15 20
CLD-239	CLSP-2-C12	5.49	1.39	4.10	123.1			FT	200	165.1	34.9	21.1	3.1	101.6	96	95	P	1	21
CLD-240	CLSP-2-C12	5.51	1.37	4.14	124.3			FT	200	165.8	34.2	20.6	2.6	103.1	98	95	P	1	34
CLD-241	CLSP-2-C12	5.51	1.39	4.12	123.7			FT	200	164.7	35.3	21.4	3.4	101.9	96	95	P	1	35

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date Checked By:	TED STILES  2-27-08 JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-242	CLSP-2-C12	5.55	1.37	4.18	125.5			FT	200	163.7	36.3	22.2	4.2	102.7	97	95	P	1	50
CLD-243	CLSP-3-C12	5.54	1.39	4.15	124.6			FT	200	161.4	38.6	23.9	3.5	100.6	98	95	P	1	LP-1-16 51
CLD-244	CLSP-3-C12	5.48	1.37	4.11	123.4			FT	200	161.0	39.0	24.2	3.8	99.4	97	95	P	1	66
CLD-245	CLSP-2-C12	5.47	1.39	4.08	122.5			FT	200	166.5	33.5	20.1	2.1	102.0	99	95	P	1	67
CLD-246	CLSP-3-C12	5.51	1.37	4.14	124.3			FT	200	160.6	39.4	24.5	4.1	99.8	97	95	P	1	68
CLD-247	CLSP-2-C12	5.55	1.37	4.18	125.5			FT	200	164.2	35.8	21.8	3.8	103.1	97	95	P	2	9
CLD-248	CLSP-2-C12	5.56	1.39	4.17	125.2			FT	200	163.4	36.6	22.4	4.4	102.3	97	95	P	2	20
CLD-249	CLSP-2-C12	5.55	1.37	4.18	125.5			FT	200	164.5	35.5	21.6	3.6	103.2	98	95	P	2	21
CLD-250	CLSP-2-C12	5.53	1.39	4.14	124.3			FT	200	163.3	36.7	22.5	4.5	101.5	96	95	P	2	LP-2-16 35
CLD-251	CLSP-2-C12	5.56	1.37	4.19	125.8			FT	200	163.2	36.8	22.5	4.5	102.7	97	95	P	2	50

Proctor Curve No. CLSP-2-C12	Maximum Dry Density PCF 105.7	Optimum Moisture % 18.0	Technician  Date	TED STILES  2-28-08
CLSP-3-C12	102.6	20.4	Checked By:	JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION	
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)								
CLD-252	CLSP-2-C12	5.51	1.39	4.12	123.7			FT	200	163.4	36.6	22.4	4.4	101.1	96	95	P	2	51	
CLD-253	CLSP-2-C12	5.52	1.37	4.15	124.6			FT	200	162.7	37.3	22.9	4.9	101.4	96	95	P	2	67	
CLD-254	CLSP-2-C12	5.54	1.39	4.15	124.6			FT	200	163.4	36.6	22.4	4.4	101.8	96	95	P	2	68	

Proctor Curve No. <u>CLSP-2-C12</u>	Maximum Dry Density PCF <u>105.7</u>	Optimum Moisture % <u>18.0</u>	Technician <u>TED STILES</u>
_____	_____	_____	Date <u>2-28-08</u>
_____	_____	_____	Checked By: <u>JEFFREY C. HELVEY, P.E.</u>
_____	_____	_____	

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-255	CLSP-2-C12	5.53	1.37	4.16	124.9			FT	200	163.0	37.0	22.7	4.7	101.8	96	95	P	3	LP-3-15 67
CLD-256	CLSP-2-C12	5.55	1.39	4.16	124.9			FT	200	163.8	36.2	22.1	4.1	102.3	97	95	P	3	68
CLD-257	CLSP-3-C12	5.49	1.37	4.12	123.7			FT	200	160.4	39.6	24.7	4.3	99.2	97	95	P	3	50
CLD-258	CLSP-2-C12	5.58	1.39	4.19	125.8			FT	200	163.1	36.9	22.6	4.6	102.6	97	95	P	3	51
CLD-259	CLSP-3-C12	5.45	1.37	4.08	122.5			FT	200	160.9	39.1	24.3	3.9	98.6	96	95	P	3	35
CLD-260	CLSP-2-C12	5.53	1.39	4.14	124.3			FT	200	163.7	36.3	22.2	4.2	101.8	96	95	P	3	20
CLD-261	CLSP-3-C12	5.48	1.37	4.11	123.4			FT	200	161.5	38.5	23.8	3.4	99.7	97	95	P	3	21
CLD-262	CLSP-3-C12	5.48	1.39	4.09	122.8			FT	200	161.2	38.8	24.1	3.7	99.0	96	95	P	3	LP-3-16 9
CLD-263	CLSP-3-C12	5.50	1.37	4.13	124.0			FT	200	160.1	39.9	24.9	4.5	99.3	97	95	P	4	50
CLD-264	CLSP-3-C12	5.46	1.39	4.07	122.2			FT	200	161.3	38.7	24.0	3.6	98.6	96	95	P	4	51

Proctor Curve No.	Maximum Dry Density	Optimum Moisture	Technician
CLSP-2-C12	PCF	%	TED STILES
CLSP-3-C12	105.7	18.0	Date
	102.6	20.4	2-29-08
			Checked By:
			JEFFREY C. HELVEY, P.E.

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP.	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-265	CLSP-3-C12	5.46	1.37	4.09	122.8			FT	200	160.6	39.4	24.5	4.1	98.6	96	95	P	4	67
CLD-266	CLSP-3-C12	5.53	1.39	4.14	124.3			FT	200	161.7	38.3	23.7	3.3	100.5	98	95	P	4	LP-4-15 68
CLD-267	CLSP-3-C12	5.51	1.37	4.14	124.3			FT	200	160.6	39.4	24.5	4.1	99.8	97	95	P	4	34
CLD-268	CLSP-3-C12	5.49	1.39	4.10	123.1			FT	200	161.4	38.6	23.9	3.5	99.4	97	95	P	4	35

Proctor Curve No. CLSP-3-C12	Maximum Dry Density PCF 102.6	Optimum Moisture % 20.4	Technician  Date	TED STILES  2-29-08
_____	_____	_____	Checked By:	JEFFREY C. HELVEY, P.E.
_____	_____	_____		
_____	_____	_____		

Drive Tube Mold Volume Factor: 0.0333

**FIELD DENSITY TEST RESULTS FOR DRIVE TUBE AND/OR NUCLEAR DENSITY GAUGE  
COMPACTED CLAY LINER**

EAST CAROLINA REGIONAL MSW LANDFILL

CONSTRUCTION OF CELL NO. 12

BERTIE COUNTY, NORTH CAROLINA

Bunnell-Lammons Engineering Project No. J07-1001-58

FIELD DENSITY TEST NO.	PROCTOR NUMBER	DRIVE TUBE				NUCLEAR GAUGE		MOISTURE DETERMINATION					PERCENT MOISTURE WET OF OPTIMUM (%)	DRY DENSITY (pcf)	% COMP. (%)	REQ. COMP. (%)	P/F	LIFT NUMBER	GRID LOCATION
		WET WEIGHT SAMPLE & MOLD (lbs)	MOLD WEIGHT (lbs)	WET WEIGHT SAMPLE (lbs)	WET DENSITY (pcf)	WET DENSITY (pcf)	MOISTURE CONTENT (%)	OVEN or FIELD TEST	WET WEIGHT MOISTURE SAMPLE (grams)	DRY WEIGHT MOISTURE SAMPLE (grams)	WEIGHT OF MOISTURE (grams)	MOISTURE CONTENT (%)							
CLD-269	CLSP-3-C12	5.47	1.37	4.10	123.1			FT	200	160.9	39.1	24.3	3.9	99.1	97	95	P	4	20
CLD-270	CLSP-3-C12	5.48	1.39	4.09	122.8			FT	200	161.6	38.4	23.8	3.4	99.2	97	95	P	4	LP-4-16 21
CLD-271	CLSP-3-C12	5.49	1.37	4.12	123.7			FT	200	161.2	38.8	24.1	3.7	99.7	97	95	P	4	9
CLD-272	CLSP-3-C12	5.48	1.39	4.09	122.8			FT	200	160.4	39.6	24.7	4.3	98.5	96	95	P	4	2

Proctor Curve No. CLSP-3-C12	Maximum Dry Density PCF 102.6	Optimum Moisture % 20.4	Technician  Date  Checked By:	TED STILES  3-1-08  JEFFREY C. HELVEY, P.E.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Drive Tube Mold Volume Factor: 0.0333

**FIELD CLAY LINER GRAIN-SIZE TEST SUMMARY**

**FIELD GRAINSIZE GRIDMAP CHECKLIST - PAGE 1**

**CONSTRUCTION QUALITY ASSURANCE - CELL 12**

**EAST CAROLINA REGIONAL MSW LANDFILL**

**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 = 667,000 sq ft (15.3 Acres) = 50,000 cy Clay Liner

PAGE 1 OF 2

MAP GRID NUMBER	Bottom 18 inches < 3-inch sieve Top 6 inches < 1-inch sieve			
	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
1	PASS		PASS	
2		PASS		PASS
3	PASS		PASS	
4		PASS		PASS
5	PASS		PASS	
6		PASS		PASS
7	PASS		PASS	
8		PASS		PASS
9	PASS		PASS	
10		PASS		PASS
11	PASS		PASS	
12		PASS		PASS
13	PASS		PASS	
14		PASS		PASS
15	PASS		PASS	
16		PASS		PASS
17	PASS		PASS	
18		PASS		PASS
19	PASS		PASS	
20		PASS		PASS
21		PASS		PASS
22	PASS		PASS	
23		PASS		PASS
24	PASS		PASS	
25		PASS		PASS
26	PASS		PASS	
27		PASS		PASS
28	PASS		PASS	
29		PASS		PASS
30	PASS		PASS	
31		PASS		PASS
32	PASS		PASS	
33		PASS		PASS
34	PASS		PASS	

MIN. NUMBER OF TESTS PER LIFT	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
	17	17	17	17
<b>NUMBER OF TESTS REQUIRED:</b>	<b>68</b>			
<b>NUMBER OF TESTS PERFORMED:</b>	<b>68</b>			

Maximum Particle Size Criteria: Bottom 18 inches < 3-inch sieve  
Top 6 inches < 1-inch sieve

Note (1): Each test represents 20,000 sf of each lift.

**FIELD GRAINSIZE GRIDMAP CHECKLIST - PAGE 2**

**CONSTRUCTION QUALITY ASSURANCE - CELL 12**

**EAST CAROLINA REGIONAL MSW LANDFILL**

**BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

Cell No. 12 = 667,000 sq ft (15.3 Acres) = 50,000 cy Clay Liner

PAGE 2 OF 2

MAP GRID NUMBER	Bottom 18 inches < 3-inch sieve Top 6 inches < 1-inch sieve			
	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
35		PASS		PASS
36	PASS		PASS	
37		PASS		PASS
38	PASS		PASS	
39		PASS		PASS
40	PASS		PASS	
41		PASS		PASS
42	PASS		PASS	
43		PASS		PASS
44	PASS		PASS	
45		PASS		PASS
46	PASS		PASS	
47		PASS		PASS
48	PASS		PASS	
49		PASS		PASS
50	PASS		PASS	
51	PASS		PASS	
52		PASS		PASS
53	PASS		PASS	
54		PASS		PASS
55	PASS		PASS	
56		PASS		PASS
57	PASS		PASS	
58		PASS		PASS
59	PASS		PASS	
60		PASS		PASS
61	PASS		PASS	
62		PASS		PASS
63	PASS		PASS	
64		PASS		PASS
65	PASS		PASS	
66		PASS		PASS
67	PASS		PASS	
68		PASS		PASS

MIN. NUMBER OF TESTS PER LIFT	LIFT NO. 1	LIFT NO. 2	LIFT NO. 3	LIFT NO. 4
	17	17	17	17
<b>NUMBER OF TESTS REQUIRED:</b>	<b>68</b>			
<b>NUMBER OF TESTS PERFORMED:</b>	<b>68</b>			

Maximum Particle Size Criteria: Bottom 18 inches < 3-inch sieve  
Top 6 inches < 1-inch sieve

Note (1): Each test represents 20,000 sf of each lift.

**APPENDIX F**

**GEOMEMBRANE (Flexible Membrane Liner, FML)  
CQA & CQC Conformance Documentation**

## **PROJECT MEMO**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BLE Project No. J07-1001-58**

**To:** Mr. Hal Newberry, P.E.  
Mr. Bill Hodges, P. E.  
Mr. Steve Nichting

**Copy:** Mr. Jeff Helvey, P.E.  
Mr. Matt Cheek, P.E.  
Mr. Ray Hoffman, P.E.  
Mr. Bill Cooksey  
Mr. Ted Stiles

**From:** Mr. Dan Bunnell, P.E.  
Mr. Justin Goss

**Date:** December 28, 2007

**Subject:** **Recommendation for Acceptance of HDPE Smooth Geomembrane.**

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We have reviewed CQA (third party) and CQC (manufacturer) conformance test results for the Poly-flex, Inc. minimum 60 mil HDPE Smooth geomembrane to be used in the construction Cell No. 12 at the East Carolina Regional MSW Landfill. The test results and frequencies for all 46 rolls meet the project CQA and CQC requirements. We therefore recommend acceptance of all 46 rolls of Poly-flex, Inc. 60 mil HDPE Smooth geomembrane for use in the construction of Cell No. 12 at the East Carolina Regional MSW Landfill. The Textured Geomembrane test results are addressed in a separate memo.

An additional 5 HDPE Smooth geomembrane rolls have been ordered for use as rub sheets, rain flaps, etc. and are not to be used for repairs or placement of the lined Cell No. 12. The following roll numbers will be marked on-site by a BLE technician to distinguish these 5 rolls from the accepted 46 HDPE Smooth geomembrane rolls. These rolls listed as follows do not meet the required specifications for the Cell No. 12:

1. HS2-6-07-1293-5
2. HS2-6-07-1294-5
3. HS2-6-07-1296-5
4. HS2-6-07-1297-5
5. HS2-6-07-1298-5

**SUMMARY OF DESIGN AND OPERATION PLAN  
HDPE GEOMEMBRANE TEST FREQUENCY REQUIREMENTS**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

**NONTEXTURED HDPE GEOMEMBRANE MANUFACTURED FOR PROJECT**

MATERIAL	NUMBER OF ROLLS
SMOOTH	46

TOTAL AREA OF CELL = 660,000 sf (15 acres)

TOTAL WEIGHT OF GEOMEMBRANE = 177,772 lbs.

TOTAL WEIGHT OF RESIN = 189,600 lbs. for smooth geomembrane (total weight of the lot from which this geomembrane was manufactured)

**TESTING REQUIREMENTS**

TEST	<i>CQA PLAN</i>					
	REQUIRED FREQUENCY		NO. OF REQUIRED TESTS		NO. OF PERFORMED TESTS	
	CQC	CQA	CQC	CQA	CQC	CQA
			Smooth	Smooth	Smooth	Smooth
<b>MANUFACTURED SHEET</b>						
THICKNESS (ASTM D 5199)	Every roll	Every Roll	46	46	46	46
SHEET DENSITY (ASTM D 792) OR (ASTM D 1505)	1 per 200,000 lbs. <sup>(2)</sup>	SEE NOTE 1	1	4	12	4
TENSILE PROPERTIES (ASTM D 6693, GRI GM13)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	9	4	12	4
TEAR RESISTANCE (ASTM D 1004)	1 per 45,000 lbs. <sup>(3)</sup>	SEE NOTE 1	4	4	12	4
NCTL (ASTM D 5397, GRI GM-10)	1 per resin lot	NONE	1	---	12	---
PUNCTURE RESISTANCE (ASTM D 4833)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	4	---	12	---
CARBON BLACK CONTENT (ASTM D 1603) OR (ASTM D 4218)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	9	4	12	4
CARBON BLACK DISPERSION (ASTM D 5596, Category 1 or 2)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	4	---	12	---
MELT INDEX (ASTM D 1238)	NONE	SEE NOTE 1	---	4	---	4

NOTE (1): Cube root of the total number of rolls

NOTE (2): Pounds of resin

NOTE (3): Pounds of geomembrane

**SMOOTH GEOMEMBRANE  
CQA CONFORMANCE DOCUMENTATION**

**SUMMARY OF CQA CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST (2)	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT			
		Roll Number/Resin Batch Number			
		HS2-6-07-6085-5 8271447	HS2-6-07-6105-5 8271447	HS2-6-07-6115-5 8271447	
Thickness (2) (mils) ASTM D 5199	≥ 60	61	60	61	—
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.9498	0.9488	0.9486	—
Carbon Black Content (%) ASTM D 1603	2 to 3	2.38	2.39	2.36	2.38
Tensile Properties ASTM D 638	Strength (3)	At Yield, ppi	203/205	201/203	209/219
		At Break, ppi	375/329	323/350	358/368
Tensile Properties ASTM D 638	Elongation (3)	At Yield, %	18/17	18/17	18/17
		At Break, %	801/784	768/821	775/828
Tear Resistance (1) (pounds) ASTM D 1004 Die C	≥ 42	59/56	59/55	57/53	—
Melt Index (grams/10 minutes) ASTM D 1238	NONE	0.1040	0.1054	0.1062	0.1016
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE (1): Test values are machine direction / transverse direction.  
NOTE (2): Lowest individual measurement shown. All 46 rolls achieved ≥ 60 mil thickness.

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

Project Name: East Carolina Cell 12

TYPE OF MQA: LEVEL (2)

QA by: SA

Material: 60 mil HDPE Smooth Geomembrane

SAMPLING FREQUENCY: Every Roll for Thickness

Manufacturer: Poly-Flex

Cube Root of the Total Number of Rolls for Conformance

Location: TX

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No/Control No
1	HS2-6-07 1293-5	8271422	500	23	11500	12/5/2007	RK	N/A	12/13/2007	G071531 C#40523
2	HS2-6-07 1294-5	8271422	500	23	11500	12/5/2007	RK	N/A	12/13/2007	G071531 C#40524
3	HS2-6-07 1296-5	8271422	500	23	11500	12/5/2007	RK	N/A	12/13/2007	G071531 C#40525
4	HS2-6-07 1297-5	8271422	500	23	11500	12/5/2007	RK	N/A	12/13/2007	G071531 C#40526
5	HS2-6-07 1298-5	8271422	500	23	11500	12/5/2007	RK	N/A	12/13/2007	G071531 C#40527
Sub Total ft <sup>2</sup> =					57500					
6	HS2-6-07 6076-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40528
7	HS2-6-07 6077-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40529
8	HS2-6-07 6078-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40530
9	HS2-6-07 6079-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40531
10	HS2-6-07 6080-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40532
11	HS2-6-07 6081-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40533
12	HS2-6-07 6082-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40534
13	HS2-6-07 6083-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40535
14	HS2-6-07 6084-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40536
15	HS2-6-07 6085-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40537
16	HS2-6-07 6086-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071539 C#40661 Conf.
17	HS2-6-07 6087-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40538
18	HS2-6-07 6088-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40539
19	HS2-6-07 6089-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40540

*Handwritten notes:*  
 1500  
 For  
 2135 (12/13)  
 &  
 1000 (12/13)  
 ONLY

# MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT

**Project Name:** East Carolina Cell 12  
**Material:** 60 mil HDPE Smooth Geomembrane  
**Manufacturer:** Poly-Flex  
**Location:** TX

**TYPE OF MQA:** LEVEL (2)      **QA by:** *SA*

**SAMPLING FREQUENCY:** Every Roll for Thickness

## Cube Root of the Total Number of Rolls for Conformance

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No/Control No
20	HS2-6-07 6090-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40542
21	HS2-6-07 6091-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40543
22	HS2-6-07 6092-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40544
23	HS2-6-07 6093-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40545
24	HS2-6-07 6094-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40546
25	HS2-6-07 6095-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40547
26	HS2-6-07 6096-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071539 C#40662 Conf.
27	HS2-6-07 6097-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40548
28	HS2-6-07 6098-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40549
29	HS2-6-07 6099-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071532 C#40550
30	HS2-6-07 6100-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40551
31	HS2-6-07 6101-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40552
32	HS2-6-07 6102-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40553
33	HS2-6-07 6103-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40554
34	HS2-6-07 6104-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40555
35	HS2-6-07 6105-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40556
36	HS2-6-07 6106-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40557
37	HS2-6-07 6107-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071539 C#40663 Conf.
38	HS2-6-07 6108-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40558
39	HS2-6-07 6109-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40559
40	HS2-6-07 6110-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40560
										G071533 C#40561
										G071533 C#40562

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

**Project Name:** East Carolina Cell 12

**Material:** 60 mil HDPE Smooth Geomembrane

**TYPE OF MQA:** LEVEL (2)

**QA by:** *MA*

**Manufacturer:** Poly-Flex

**SAMPLING FREQUENCY:** Every Roll for Thickness

**Cube Root of the Total Number of Rolls for Conformance**

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No/Control No
41	HS2-6-07 6111-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40563
42	HS2-6-07 6112-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40564
43	HS2-6-07 6113-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40565
44	HS2-6-07 6114-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40566
45	HS2-6-07 6115-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40567 G071539 C#40664 Conf.
46	HS2-6-07 6116-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40568
47	HS2-6-07 6117-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40569
48	HS2-6-07 6118-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40570
49	HS2-6-07 6119-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40571
50	HS2-6-07 6120-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40572
51	HS2-6-07 6121-5	8271447	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071533 C#40573
					<b>Sub Total ft<sup>2</sup> =</b>	529000				
					<b>TOTAL ft<sup>2</sup> =</b>	586,500				

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

Project Name: East Carolina Cell 12

Material: 60mil HDPE Smooth Geomembrane

Manufacturer: Poly-Flex

LOCATION: TX

TYPE OF MQA: LEVEL (2)

SAMPLING FREQUENCY: Every Roll

Rec# 256 DC# 1973 PGL JOB No: G071532

No.	Roll #	Resin Lot Batch No.	Liner Dimensions	Date Manufactured	Control #	Thickness ASTM D5199										Ave	SD	Min.	Max.
						63	64	65	64	63	64	63	65	64	63				
1	HS2-6-07-6076-5	8271447	11,500	12/4/2007	40528	63	64	65	64	63	64	63	65	64	63	64	1	63	65
2	HS2-6-07-6077-5	8271447	11,500	12/4/2007	40529	64	64	64	61	63	62	62	62	63	62	63	1	61	64
3	HS2-6-07-6078-5	8271447	11,500	12/4/2007	40530	64	61	62	62	61	63	61	63	64	62	1	61	64	
4	HS2-6-07-6079-5	8271447	11,500	12/4/2007	40531	63	61	63	64	64	63	63	63	64	64	1	61	64	
5	HS2-6-07-6080-5	8271447	11,500	12/4/2007	40532	63	64	64	64	63	65	64	63	63	64	1	63	65	
6	HS2-6-07-6081-5	8271447	11,500	12/4/2007	40533	63	63	64	65	64	64	64	65	62	63	1	62	65	
7	HS2-6-07-6082-5	8271447	11,500	12/4/2007	40534	62	61	63	62	61	62	61	61	64	62	1	61	64	
8	HS2-6-07-6083-5	8271447	11,500	12/4/2007	40535	64	63	62	62	61	64	65	63	61	63	1	61	65	
9	HS2-6-07-6084-5	8271447	11,500	12/4/2007	40536	63	64	65	66	64	63	64	65	61	62	1	61	66	
10	HS2-6-07-6085-5	8271447	11,500	12/4/2007	40537	63	62	63	63	61	63	63	61	62	61	1	61	63	
11	HS2-6-07-6086-5	8271447	11,500	12/4/2007	40538	63	62	63	62	62	60	62	61	62	60	1	60	63	
12	HS2-6-07-6087-5	8271447	11,500	12/4/2007	40539	64	63	62	62	61	62	60	62	60	62	1	60	64	
13	HS2-6-07-6088-5	8271447	11,500	12/4/2007	40540	62	61	62	61	61	61	61	61	62	61	0	61	62	
14	HS2-6-07-6089-5	8271447	11,500	12/4/2007	40541	62	63	63	62	61	62	61	63	62	62	1	61	63	
15	HS2-6-07-6090-5	8271447	11,500	12/4/2007	40542	63	62	62	60	61	63	62	63	63	62	1	60	63	
16	HS2-6-07-6091-5	8271447	11,500	12/4/2007	40543	63	63	62	62	61	62	62	61	62	64	1	61	64	
17	HS2-6-07-6092-5	8271447	11,500	12/4/2007	40544	63	62	63	62	62	62	60	62	63	62	1	60	63	
18	HS2-6-07-6093-5	8271447	11,500	12/4/2007	40545	61	62	61	62	62	61	61	62	62	62	0	61	62	
19	HS2-6-07-6094-5	8271447	11,500	12/4/2007	40546	63	62	62	61	62	62	61	62	62	62	1	61	63	
20	HS2-6-07-6095-5	8271447	11,500	12/4/2007	40547	61	62	62	61	62	61	61	61	62	61	0	61	62	
21	HS2-6-07-6096-5	8271447	11,500	12/4/2007	40548	63	61	61	62	61	62	61	61	62	60	1	60	63	
22	HS2-6-07-6097-5	8271447	11,500	12/4/2007	40549	63	62	62	62	63	62	61	62	61	61	1	61	63	
23	HS2-6-07-6098-5	8271447	11,500	12/4/2007	40550	61	62	62	62	61	61	61	62	60	62	1	60	62	



**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

Project Name: East Carolina Cell 12

Material: 60mil HDPE Smooth Geomembrane

Manufacturer: Poly-Flex

LOCATION: TX

TYPE OF MQA: LEVEL (2) QC'd by:                     

SAMPLING FREQUENCY: Every Roll

Rec# 256 DC# 1973 PGL JOB No: G071533

No.	Roll #	Batch No.	Liner Dimensions	Date Manufactured	Control #	Thickness ASTM D5199										Ave	SD	Min.	Max.			
						62	62	62	62	62	62	62	62	62	62					62	62	62
19	HS2-6-07-6117-5	8271447	11,500	12/4/2007	40569	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	63	
20	HS2-6-07-6118-5	8271447	11,500	12/4/2007	40570	63	61	62	61	61	62	61	63	62	61	62	61	62	61	61	63	
21	HS2-6-07-6119-5	8271447	11,500	12/4/2007	40571	62	62	62	61	61	62	61	61	61	62	61	61	62	61	1	61	62
22	HS2-6-07-6120-5	8271447	11,500	12/4/2007	40572	63	62	61	63	62	61	61	62	62	61	62	61	62	61	1	61	63
23	HS2-6-07-6121-5	8271447	11,500	12/4/2007	40573	62	61	61	61	62	60	61	61	62	60	61	61	62	60	1	60	62



**TABLE 1.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/20/2007  
 Client Sample ID: HS2-6-07-6085-5  
 Material Description: 60 mil HDPE Smooth Geomembrane

QC'd By: *[Signature]*  
 PGL Job No.: G071539  
 PGL Control No.: 40661

METHOD	DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.		
		1	2	3	4	5	6	7	8	9	10							
ASTM D1505	Density (grams/cm.3)	0.9498	0.9498	0.9498											0.9498	0.9498		
ASTM D638	Tensile Properties:																	
Type IV	Test Specimens: Type IV, Width of narrow section: 0.25in, Length of narrow section: 1.3in, Width Overall: 0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 ° C (73.4+/-3.6 ° F, and 50+/-5% relative humidity. Rate of Separation: 2"/min (HDPE) 2"/min (VLDPE/LLDPE)																	
	Tensile Strength at Yield (lbs/in.-width)																	
	MD 216	214	218	214	220										216	3	214	220
	TD 206	202	210	200	216										207	6	200	216
	Tensile Strength at Break (lbs/in.- width)																	
	MD 391	356	384	365	376										375	14	356	391
	TD 330	327	334	316	336										329	8	316	336
	Elongation at Yield (percent)																	
	MD 17	18	18	18	18										18	1	17	18
	TD 18	18	18	18	18										18	0	18	18
	Elongation at Break (percent)																	
	MD 841	788	810	787	780										801	25	780	841
	TD 765	756	804	760	838										784	35	756	838
ASTM D1004	Tear Resistance (lbs)																	
Die C	Machine: Tensile machine equipped with constant rate of extension and chart recorder.																	
	MD 57	60	60	57	59										59	1	57	61
	TD 55	57	59	54	55										56	2	54	59
ASTM D1603	Carbon Black Content (percent)																	
	2.35	2.40													2.38	0.04	2.35	2.40
ASTM D1238	Melt Flow Index (grams/ 10 minutes)																	
Procedure A	Condition FR-190/2.16; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 ° C and 2.16kg load.																	
	0.1029	0.1034	0.1057												0.1040	0.0015	0.1029	0.1057



MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION  
 DC#1987 Record #268

**TABLE 2.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
Date Reported: 12/20/2007  
Client Sample ID: HS2-6-07-6095-5  
Material Description: 60 mil HDPE Smooth Geomembrane

QC'd By: *[Signature]*  
PGL Job No.: G071539  
PGL Control No.: 40662

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.
	1	2	3	4	5	6	7	8	9	10					
ASTM D1505 Density (grams/cm.3)	0.9490	0.9490	0.9490	0.9490							0.9490	0.0000	0.9490	0.9490	
ASTM D638 Tensile Properties: Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23±/2 ° C (73.4±/3.6 ° F, and														
Tensile Strength at Yield (lbs/ in.-width)	MD 205	204	200	208	200	200									
	TD 205	208	202	207	202	202									
Tensile Strength at Break (lbs/ in.- width)	MD 316	352	312	323	312	312									
	TD 351	356	340	356	344	344									
Elongation at Yield (percent)	MD 18	18	18	17	18	18									
	TD 17	17	17	18	17	17									
Elongation at Break (percent)	MD 780	767	756	801	738	738									
	TD 812	851	799	839	806	806									
ASTM D1004 Tear Resistance (lbs)	Machine: Tensile machine equipped with constant rate of extension and chart recorder.														
Die C	MD 60	60	63	61	60	57	57	57	58	59	59				
	TD 56	56	56	56	56	56	55	55	54	55	53				
ASTM D1603 Carbon Black Content (percent)	2.37	2.41													
ASTM D1238 Melt Flow Index (grams/ 10 minutes)	Condition FR-1902.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 ° C and 2.16kg load.														
Procedure A	0.1043	0.1022	0.1097												
	0.9490														
	203														
	205														
	323														
	350														
	18														
	17														
	768														
	821														
	59														
	55														
	2.39														
	0.1054														
	0.0039														
	0.1022														
	0.1097														



**TABLE 3.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/20/2007  
 Client Sample ID: HS2-6-07-6105-5  
 Material Description: 60 mil HDPE Smooth Geomembrane

QC'd By: *[Signature]*  
 PGL Job No.: G071539  
 PGL Control No.: 40663

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min.	Max.	Proj. Specs.
	1	2	3	4	5	6	7	8	9	10					
ASTM D1505 Density (grams/cm.3)	0.9488	0.9488	0.9488											0.9488	0.9488
ASTM D638 Tensile Properties:	Test Specimens: Type IV, Width of narrow section: 0.25in, Length of narrow section: 1.3in, Width Overall: 0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F, and 50+/-5% relative humidity. Rate of Separation: 2"/min (HDPE) 2"/min (VLDPE/LLDPE)														
Tensile Strength at Yield (lbs/in.-width)	MD 199	200	201	203	200	200									
TD 210	208	200	200	200	195										
Tensile Strength at Break (lbs/in.- width)	MD 318	328	332	331	316										
TD 363	367	368	368	356	360										
Elongation at Yield (percent)	MD 17	18	18	19	18										
TD 16	17	17	17	18	17										
Elongation at Break (percent)	MD 719	756	801	795	745										
TD 826	851	862	815	815	860										
ASTM D1004 Tear Resistance (lbs)	Machine: Tensile machine equipped with constant rate of extension and chart recorder.														
Die C	MD 60	59	59	59	61	59	58	58	58	58					
TD 54	55	55	53	55	55	56	54	55	54						
ASTM D1603 Carbon Black Content (percent)	2.35	2.37													
ASTM D1238 Melt Flow Index (grams/ 10 minutes)	Condition FR-1902.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 °C and 2.16kg load.														
Procedure A	0.1106	0.1025	0.1056												
														0.1062	0.1106



MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION  
 DC#1987 Record #268

**TABLE 4.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/20/2007  
 Client Sample ID: HS2-6-07-6115-5  
 Material Description: 60 mil HDPE Smooth Geomembrane

QC'd By:   
 PGL Job No.: G071539  
 PGL Control No.: 40664

METHOD DESCRIPTION	SPECIMENS										Proj. Specs.					
	1	2	3	4	5	6	7	8	9	10		Avg.	Std. Dev.	Min	Max	
ASTM D1505 Density (grams/cm.3)	0.9486 0.9486 0.9486 0.9486 0.9486 0.9486 0.9486 0.9486 0.9486 0.9486 0.9486 0.0000 0.9486 0.9486 0.9486															
ASTM D638 Type IV Tensile Properties:	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F, and 50+/-5% relative humidity. Rate of Separation: 2"/min (HDPE) 2"/min (VLDPE/LLDPE)															
Tensile Strength at Yield (lbs/ in.-width)	MD 214	210	212	198	213	213							198	214		
	TD 215	234	204	225	215	215							204	234		
Tensile Strength at Break (lbs/ in.- width)	MD 406	356	336	316	374	374							316	406		
	TD 376	410	381	344	328	328							328	410		
Elongation at Yield (percent)	MD 18	19	18	18	18	18							18	19		
	TD 16	17	17	17	17	17							16	17		
Elongation at Break (percent)	MD 836	766	723	745	805	805	Gauge Length = 2.0 in. (GRI-GM13 Mod)								723	836
	TD 867	894	882	745	751	751							745	894		
ASTM D1004 Tear Resistance (lbs)	Machine: Tensile machine equipped with constant rate of extension and chart recorder.															
Die C	MD 58	60	56	57	56	57							56	60		
	TD 51	51	53	52	53	55							51	55		
ASTM D1603 Carbon Black Content (percent)	2.41 2.35															
ASTM D1238 Melt Flow Index (grams/ 10 minutes)	Condition FR-190/2.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 °C and 2.16kg load															
Procedure A	0.1023	0.0970	0.1054										0.0970	0.1054		
											0.1016	0.0042	0.0970	0.1054		



**SMOOTH GEOMEMBRANE  
CQC CONFORMANCE DOCUMENTATION**

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Laamons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE (1)		CONFORMANCE TEST RESULT			
TEST	REQUIRED TEST VALUE	Roll Number/Resin Batch Number			
		HS2-6-07-6076-5 8271447	HS2-6-07-6084-5 8271447	HS2-6-07-6088-5 8271447	HS2-6-07-6092-5 8271447
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.947	0.947	0.947	0.947
Thickness (2) (mils) ASTM D 5199	≥ 60	60	61	60	61
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.5	2.5	2.3	2.3
Tensile Properties ASTM D 6693	Strength				
	At Yield, ppi	163	168	172	180
	At Break, ppi	310	329	339	356
Tensile Properties ASTM D 6693	Elongation				
	At Yield, %	21	18	21	21
	At Break, %	781	893	819	867
Puncture Resistance (pounds) ASTM D 4833	≥ 90	154	154	161	161
Tear Resistance (pounds) ASTM D 1004	≥ 42	56	51	57	58
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1	1	1
NCTL (hrs) ASTM D 5397	≥ 300	PASS	PASS	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 46 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5199) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST		CONFORMANCE TEST RESULT				
REQUIRED TEST VALUE		Roll Number/Resin Batch Number				
		HS2-6-07-6096-5 8271447	HS2-6-07-6100-5 8271447	HS2-6-07-6108-5 8271447	HS2-6-07-6112-5 8271447	
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.947	0.947	0.947	0.948	
Thickness <sup>(2)</sup> (mils) ASTM D 5199	≥ 60	60	61	60	60	
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.3	2.3	2.4	2.5	
Tensile Properties ASTM D 6693	Strength	At Yield, ppi	176	172	171	163
		At Break, ppi	343	329	343	323
Tensile Properties ASTM D 6693	Elongation	At Yield, %	18	21	18	21
		At Break, %	929	834	940	836
Puncture Resistance (pounds) ASTM D 4833	≥ 90	156	161	151	153	157
Tear Resistance (pounds) ASTM D 1004	≥ 42	54	58	53	57	54
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1	1	1	1
NCTL (hrs) ASTM D 5397	≥ 300	PASS	PASS	PASS	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 46 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5199) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Smooth HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE (1)		CONFORMANCE TEST RESULT	
TEST	REQUIRED TEST VALUE	Roll Number/Resin Batch Number	
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	HS2-6-07-6116-5 8271447	HS2-6-07-6120-5 8271447
Thickness (2) (mils) ASTM D 5199	≥ 60	60	61
Carbon Black Content (%) ASTM D 1603	2.0 to 3.0	2.2	2.3
Tensile Properties ASTM D 6693	At Yield, ppi ≥ 126	171	179
	At Break, ppi ≥ 90	308	346
Elongation ASTM D 6693	At Yield, % ≥ 12	21	18
	At Break, % ≥ 100	800	915
Puncture Resistance (pounds) ASTM D 4833	≥ 90	154	159
Tear Resistance (pounds) ASTM D 1004	≥ 42	58	54
Carbon Black Dispersion ASTM D 5596	Cat 1 or 2	1	1
NCTL (hrs.) ASTM D 5397	≥ 300	PASS	PASS
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>

NOTE: All 46 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5199) requirements. The resin lots passed NCTL testing.

# POLY-FLEX, INC.

1700834  
Material Pre-Certification List

Date:	12/4/2007	Material Type:	60HD - Custom
Project Number:	277329	Material Quantity:	46
Customer/Project:	Republic / East Carolina Env	Completed by:	MH

#	Blend	Roll Number	Weight	Roll Description
1	8271447	HS2 - 6 - 07 - 6076 - 5	3,944	23' X 500' X .060HD - Cust
2	8271447	HS2 - 6 - 07 - 6077 - 5	3,940	23' X 500' X .060HD - Cust
3	8271447	HS2 - 6 - 07 - 6078 - 5	3,954	23' X 500' X .060HD - Cust
4	8271447	HS2 - 6 - 07 - 6079 - 5	3,954	23' X 500' X .060HD - Cust
5	8271447	HS2 - 6 - 07 - 6080 - 5	3,938	23' X 500' X .060HD - Cust
6	8271447	HS2 - 6 - 07 - 6081 - 5	3,944	23' X 500' X .060HD - Cust
7	8271447	HS2 - 6 - 07 - 6082 - 5	3,944	23' X 500' X .060HD - Cust
8	8271447	HS2 - 6 - 07 - 6083 - 5	3,944	23' X 500' X .060HD - Cust
9	8271447	HS2 - 6 - 07 - 6084 - 5	3,940	23' X 500' X .060HD - Cust
10	8271447	HS2 - 6 - 07 - 6085 - 5	3,946	23' X 500' X .060HD - Cust
11	8271447	HS2 - 6 - 07 - 6086 - 5	3,940	23' X 500' X .060HD - Cust
12	8271447	HS2 - 6 - 07 - 6087 - 5	3,938	23' X 500' X .060HD - Cust
13	8271447	HS2 - 6 - 07 - 6088 - 5	3,912	23' X 500' X .060HD - Cust
14	8271447	HS2 - 6 - 07 - 6089 - 5	3,936	23' X 500' X .060HD - Cust
15	8271447	HS2 - 6 - 07 - 6090 - 5	3,940	23' X 500' X .060HD - Cust
16	8271447	HS2 - 6 - 07 - 6091 - 5	3,920	23' X 500' X .060HD - Cust
17	8271447	HS2 - 6 - 07 - 6092 - 5	3,942	23' X 500' X .060HD - Cust
18	8271447	HS2 - 6 - 07 - 6093 - 5	3,946	23' X 500' X .060HD - Cust
19	8271447	HS2 - 6 - 07 - 6094 - 5	3,948	23' X 500' X .060HD - Cust
20	8271447	HS2 - 6 - 07 - 6095 - 5	3,952	23' X 500' X .060HD - Cust
21	8271447	HS2 - 6 - 07 - 6096 - 5	3,958	23' X 500' X .060HD - Cust
22	8271447	HS2 - 6 - 07 - 6097 - 5	3,946	23' X 500' X .060HD - Cust
23	8271447	HS2 - 6 - 07 - 6098 - 5	3,942	23' X 500' X .060HD - Cust
24	8271447	HS2 - 6 - 07 - 6099 - 5	3,932	23' X 500' X .060HD - Cust
25	8271447	HS2 - 6 - 07 - 6100 - 5	3,940	23' X 500' X .060HD - Cust
26	8271447	HS2 - 6 - 07 - 6101 - 5	3,942	23' X 500' X .060HD - Cust
27	8271447	HS2 - 6 - 07 - 6102 - 5	3,932	23' X 500' X .060HD - Cust
28	8271447	HS2 - 6 - 07 - 6103 - 5	3,940	23' X 500' X .060HD - Cust
29	8271447	HS2 - 6 - 07 - 6104 - 5	3,946	23' X 500' X .060HD - Cust
30	8271447	HS2 - 6 - 07 - 6105 - 5	3,956	23' X 500' X .060HD - Cust
31	8271447	HS2 - 6 - 07 - 6106 - 5	3,952	23' X 500' X .060HD - Cust
32	8271447	HS2 - 6 - 07 - 6107 - 5	3,952	23' X 500' X .060HD - Cust
33	8271447	HS2 - 6 - 07 - 6108 - 5	3,944	23' X 500' X .060HD - Cust
34	8271447	HS2 - 6 - 07 - 6109 - 5	3,944	23' X 500' X .060HD - Cust
35	8271447	HS2 - 6 - 07 - 6110 - 5	3,950	23' X 500' X .060HD - Cust
36	8271447	HS2 - 6 - 07 - 6111 - 5	3,946	23' X 500' X .060HD - Cust
37	8271447	HS2 - 6 - 07 - 6112 - 5	3,944	23' X 500' X .060HD - Cust

# POLYFLEX, INC.

Material Pre-Certification List

Date:	12/4/2007	Material Type:	60HD - Custom
Project Number:	277329	Material Quantity:	46
Customer/Project:	Republic / East Carolina Env	Completed by:	MH

38	8271447	HS2 - 6 - 07 - 6113 - 5	3,940	23' X 500' X .060HD - Cust
39	8271447	HS2 - 6 - 07 - 6114 - 5	3,936	23' X 500' X .060HD - Cust
40	8271447	HS2 - 6 - 07 - 6115 - 5	3,938	23' X 500' X .060HD - Cust
41	8271447	HS2 - 6 - 07 - 6116 - 5	3,938	23' X 500' X .060HD - Cust
42	8271447	HS2 - 6 - 07 - 6117 - 5	3,932	23' X 500' X .060HD - Cust
43	8271447	HS2 - 6 - 07 - 6118 - 5	3,936	23' X 500' X .060HD - Cust
44	8271447	HS2 - 6 - 07 - 6119 - 5	3,932	23' X 500' X .060HD - Cust
45	8271447	HS2 - 6 - 07 - 6120 - 5	3,930	23' X 500' X .060HD - Cust
46	8271447	HS2 - 6 - 07 - 6121 - 5	3,926	23' X 500' X .060HD - Cust

# CERTIFICATION SHEET

DATE: January 3, 2008

**POLY-FLEX, INC.**

2000 W. Marshall Drive  
Grand Prairie, Texas 75051

PROJECT NO: 277329

ORDER NO: Pre-Certification

TRIP NO: Pre-Certification

CERTIFIED BY:

TEST DESCRIPTION	THICKNESS	CARBON BLACK	TEAR	PUNCTURE	TENSILE @ YIELD	ELONG @ YIELD	TENSILE @ BREAK	ELONG @ BREAK	CAR. BLK. DISPERSION	DENSITY	NCTL	OXIDATIVE INDUCTION TIME	OVEN AGING	UV RESISTANCE	
ASTM METHOD	D5199	D1603	D1004	D4833	D6693	D6693	D6693	D6693	D5596	D1505	D5397	D3895	D5885	D5885	
(modifications)	min	%	lb	lb	ppi	%	ppi	%	Cat 1or2	g/cc	hrs	min.	%	%	
SPECIFICATION	60	2.0-3.0	42	108	126	12	228	700		0.940	300	100	80	50	
ROLL NUMBER	BLEND														
HS2-6-07 6076-5	8271447	2.5	56	154	163	21	310	781	1	0.947	Pass	187	85	77	
HS2-6-07 6077-5	8271447	2.5	56	154	163	21	310	781	1	0.947	Pass	187	85	77	
HS2-6-07 6078-5	8271447	2.5	56	154	163	21	310	781	1	0.947	Pass	187	85	77	
HS2-6-07 6079-5	8271447	2.5	56	154	163	21	310	781	1	0.947	Pass	187	85	77	
HS2-6-07 6080-5	8271447	2.5	51	154	168	18	329	893	1	0.947	Pass	187	85	77	
HS2-6-07 6081-5	8271447	2.5	51	154	168	18	329	893	1	0.947	Pass	187	85	77	
HS2-6-07 6082-5	8271447	2.5	51	154	168	18	329	893	1	0.947	Pass	187	85	77	
HS2-6-07 6083-5	8271447	2.5	51	154	168	18	329	893	1	0.947	Pass	187	85	77	
HS2-6-07 6084-5	8271447	2.3	57	161	172	21	339	819	1	0.947	Pass	194	85	77	
HS2-6-07 6085-5	8271447	2.3	57	161	172	21	339	819	1	0.947	Pass	194	85	77	
HS2-6-07 6086-5	8271447	2.3	57	161	172	21	339	819	1	0.947	Pass	194	85	77	
HS2-6-07 6087-5	8271447	2.3	57	161	172	21	339	819	1	0.947	Pass	194	85	77	
HS2-6-07 6088-5	8271447	2.3	53	157	190	18	349	937	1	0.947	Pass	194	85	77	
HS2-6-07 6089-5	8271447	2.3	53	157	190	18	349	937	1	0.947	Pass	194	85	77	
HS2-6-07 6090-5	8271447	2.3	53	157	190	18	349	937	1	0.947	Pass	194	85	77	
HS2-6-07 6091-5	8271447	2.3	53	157	190	18	349	937	1	0.947	Pass	194	85	77	
HS2-6-07 6092-5	8271447	2.3	58	161	180	21	356	867	1	0.947	Pass	188	85	77	

# CERTIFICATION SHEET

DATE: January 3, 2008

# POLY-FLEX, INC.

2000 W. Marshall Drive  
Grand Prairie, Texas 75051

PROJECT NO: 277329

ORDER NO: Pre-Certification

TRIP NO: Pre-Certification

CERTIFIED BY: 

TEST DESCRIPTION	THICKNESS	CARBON BLACK	TEAR	PUNCTURE	TENSILE @ YIELD	ELONG @ YIELD	TENSILE @ BREAK	ELONG @ BREAK	CAR. BLK. DISPERSION	DENSITY	NCTL	OXIDATIVE INDUCTION TIME	OVEN AGING	UV RESISTANCE
	D5199	D1603	D1004	D4833	D6693	D6693	D6693	D6693	D5596	D1505	D5397	D3895	D5885	D5885
ASTM METHOD	min	%	lb	lb	ppi	%	ppi	%		g/cc	hrs	min.	%	%
UNITS	mils								Cat 1or2	0.940	300	100	80	50
SPECIFICATION	60	2.0-3.0	42	108	126	12	228	700						
BLEND														
HS2-6-07 6093-5	62	2.3	58	161	180	21	356	867	1	0.947	Pass	188	85	77
HS2-6-07 6094-5	61	2.3	58	161	180	21	356	867	1	0.947	Pass	188	85	77
HS2-6-07 6095-5	60	2.3	58	161	180	21	356	867	1	0.947	Pass	188	85	77
HS2-6-07 6096-5	60	2.3	54	156	176	18	343	929	1	0.947	Pass	188	85	77
HS2-6-07 6097-5	60	2.3	54	156	176	18	343	929	1	0.947	Pass	188	85	77
HS2-6-07 6098-5	61	2.3	54	156	176	18	343	929	1	0.947	Pass	188	85	77
HS2-6-07 6099-5	61	2.3	54	156	176	18	343	929	1	0.947	Pass	188	85	77
HS2-6-07 6100-5	61	2.3	58	161	172	21	329	834	1	0.947	Pass	188	85	77
HS2-6-07 6101-5	61	2.3	58	161	172	21	329	834	1	0.947	Pass	188	85	77
HS2-6-07 6102-5	60	2.3	58	161	172	21	329	834	1	0.947	Pass	188	85	77
HS2-6-07 6103-5	61	2.3	58	161	172	21	329	834	1	0.947	Pass	188	85	77
HS2-6-07 6104-5	60	2.4	53	151	171	18	343	940	1	0.947	Pass	196	85	77
HS2-6-07 6105-5	60	2.4	53	151	171	18	343	940	1	0.947	Pass	196	85	77
HS2-6-07 6106-5	61	2.4	53	151	171	18	343	940	1	0.947	Pass	196	85	77
HS2-6-07 6107-5	60	2.4	53	151	171	18	343	940	1	0.947	Pass	196	85	77
HS2-6-07 6108-5	60	2.3	57	153	163	21	323	836	1	0.947	Pass	196	85	77
HS2-6-07 6109-5	60	2.3	57	153	163	21	323	836	1	0.947	Pass	196	85	77







## Certificate of Analysis

Shipped To: POLY AMERICA: GP (GEO)  
2000 W MARSHALL  
GRAND PRAIRIE TX 75051  
USA

Recipient: Averite  
Fax:

CPC Delivery #: 87514723  
PO #: 273458  
Weight: 189600 LB  
Ship Date: 10/24/2007  
Package: BULK  
Mode: Hopper Car  
Car #: PSPX002458  
Seal No: 246264

Product:  
MARLEX POLYETHYLENE K308 BULK

NCTL, ASTM D5397-95 Appendix (modified), Avg: >500 Hours (not tested on each lot)

Lot Number: 8271447

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.10	g/10ml
HLMI Flow Rate	ASTM D1238	10.4	g/10ml
Density	ASTM D1505	0.936	g/cm3
Production Date		09/22/2007	

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.

  
Paul S. Newbold  
Quality Systems Coordinator

For CoA questions contact Tom Schelman at 832-813-4637

# POLYFLEX, INC.

Material Pre-Certification List

Date:	12/5/2007	Material Type:	60HD
Project Number:	277329	Material Quantity:	5
Customer/Project:	Republic / East Carolina Env	Completed by:	CM

#	Blend	Roll Number	Weight	Roll Description
1	8271422	HS2 - 6 - 07 - 1293 - 5	3,572	23' X 500' X .060HD
2	8271422	HS2 - 6 - 07 - 1294 - 5	3,584	23' X 500' X .060HD
3	8271422	HS2 - 6 - 07 - 1296 - 5	3,574	23' X 500' X .060HD
4	8271422	HS2 - 6 - 07 - 1297 - 5	3,574	23' X 500' X .060HD
5	8271422	HS2 - 6 - 07 - 1298 - 5	3,574	23' X 500' X .060HD





CoA Date: 10/22/2007

## Certificate of Analysis

Shipped To: POLY AMERICA: GP (GEO)  
2000 W MARSHALL  
GRAND PRAIRIE TX 75051  
USA

CPC Delivery #: 87513413  
PO #: 273458  
Weight: 189800 LB  
Ship Date: 10/22/2007  
Package: BULK  
Mode: Hopper Car  
Car #: PSPX006581  
Seal No: 246385

Recipient: Averitte  
Fax:

Product:  
MARLEX POLYETHYLENE K306 BULK

NCTL, ASTM D5397-95 Appendix (modified), Avg: >500 Hours (not tested on each lot)

Lot Number: 8271422

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.10	g/10mi
HLMI Flow Rate	ASTM D1238	11.6	g/10mi
Density	ASTM D1505	0.938	g/cm3
Production Date		09/17/2007	

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.

  
Paul S. Newbold  
Quality Systems Coordinator

For CoA questions contact Tom Scheirman at 832-813-4637

## **PROJECT MEMO**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BLE Project No. J07-1001-58**

**To:** Mr. Hal Newberry, P.E.  
Mr. Bill Hodges, P. E.  
Mr. Steve Nichting

**Copy:** Mr. Jeff Helvey, P.E.  
Mr. Matt Cheek, P.E.  
Mr. Ray Hoffman, P.E.  
Mr. Bill Cooksey  
Mr. Ted Stiles

**From:** Mr. Dan Bunnell, P.E.  
Mr. Justin Goss

**Date:** December 28, 2007

**Subject: Recommendation for Acceptance of HDPE Textured Geomembrane.**

---

We have reviewed CQA (third party) and CQC (manufacturer) conformance test results for the Poly-flex, Inc. minimum 60 mil HDPE Textured geomembrane to be used in the construction Cell No. 12 at the East Carolina Regional MSW Landfill. The test results and frequencies for all 16 rolls meet the project CQA and CQC requirements. We therefore recommend acceptance of all 16 rolls of Poly-flex, Inc. 60 mil HDPE Textured geomembrane for use in the construction of construction Cell No. 12 at the East Carolina Regional MSW Landfill. The Smooth geomembrane test results are addressed in a separate memo.

**SUMMARY OF DESIGN AND OPERATION PLAN  
HDPE GEOMEMBRANE TEST FREQUENCY REQUIREMENTS**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12

Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

**TEXTURED HDPE GEOMEMBRANE MANUFACTURED FOR PROJECT**

MATERIAL	NUMBER OF ROLLS
TEXTURED	16

TOTAL AREA OF CELL = 660,000 sf (15 acres)

TOTAL WEIGHT OF GEOMEMBRANE = 65,981 lbs.

TOTAL WEIGHT OF RESIN = 192,500 lbs. for textured geomembrane (total weight of the lot from which this geomembrane was manufactured)

**TESTING REQUIREMENTS**

TEST	CQA PLAN					
	REQUIRED FREQUENCY		NO. OF REQUIRED TESTS		NO. OF PERFORMED TESTS	
	CQC	CQA	CQC	CQA	CQC	CQA
			Textured	Textured	Textured	Textured
<b>MANUFACTURED SHEET</b>						
THICKNESS (ASTM D 5994)	Every roll	Every roll	16	16	16	16
SHEET DENSITY (ASTM D 792) OR (ASTM D 1505)	1 per 200,000 lbs. <sup>(2)</sup>	SEE NOTE 1	1	3	5	3
TENSILE PROPERTIES (ASTM D 6693, GRI GM13)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	4	3	5	3
TEAR RESISTANCE (ASTM D 1004)	1 per 45,000 lbs. <sup>(3)</sup>	SEE NOTE 1	2	3	5	3
NCTL (ASTM D 5397, GRI GM-10)	1 per resin lot	NONE	1	---	1	---
PUNCTURE RESISTANCE (ASTM D 4833)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	2	---	5	---
CARBON BLACK CONTENT (ASTM D 1603) OR (ASTM D 4218)	1 per 20,000 lbs. <sup>(3)</sup>	SEE NOTE 1	4	3	5	3
CARBON BLACK DISPERSION (ASTM D 5596, Category 1 or 2)	1 per 45,000 lbs. <sup>(3)</sup>	NONE	2	---	5	---
ASPERITY HEIGHT (GRI GM-12))	1 per 2 rolls	NONE	8	---	16	---
MELT INDEX (ASTM D 1238)	NONE	SEE NOTE 1	---	3	---	3

NOTE (1): Cube root of the total number of rolls

NOTE (2): Pounds of resin

NOTE (3): Pounds of geomembrane

**TEXTURED GEOMEMBRANE  
CQA CONFORMANCE DOCUMENTATION**

**SUMMARY OF CQA CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST (2)	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT		
		HTI-6-07-7604-5 8271440	HTI-6-07-7610-05 8271440	HTI-6-07-7617-05 8271440
Thickness (mils) ASTM D 5994	≥ 60	60	60	61
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.9497	0.9490	0.9488
Carbon Black Content (%) ASTM D 1603	2 to 3	2.44	2.36	2.39
Tensile Properties ASTM D 638	Strength (3)	211/212	201/205	220/211
	At Yield, ppi	≥ 126		
Tensile Properties ASTM D 638	Elongation (3)	18/17	18/17	17/17
	At Break, ppi	≥ 90	257/192	250/219
Tear Resistance <sup>(1)</sup> (pounds) ASTM D 1004 Die C	At Yield, %	≥ 12		
	At Break, %	≥ 100	517/410	485/482
Melt Index (grams/10 minutes) ASTM D 1238	Tear Resistance <sup>(1)</sup> (pounds)	≥ 42	63/58	61/56
	ASTM D 1004 Die C	NONE	0.2197	0.2039
<b>APPROVED</b>		<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE (1): Test values are machine direction / transverse direction.  
NOTE (2): Lowest individual measurement shown. All 16 textured rolls achieved ≥ 60 mil thickness.

# MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT

**Project Name:** East Carolina Cell 12  
**Material:** 60 mil HDPE Textured Geomembrane  
**Manufacturer:** Poly-Flex  
**Location:** TX

**TYPE OF MQA:** LEVEL (2)      **QA by:** SA  
**SAMPLING FREQUENCY:** Every Roll for Thickness  
**Cube Root of the Total Number of Rolls for Conformance**

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No/Control No
1	HT1-6-07- 7604-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40633 G071559 C#40836 Conf.
2	HT1-6-07- 7605-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40634
3	HT1-6-07- 7606-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40635
4	HT1-6-07- 7609-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40636
5	HT1-6-07- 7610-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071538 C#40659 Conf. G071537 C#40637
6	HT1-6-07- 7611-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40638
7	HT1-6-07- 7612-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40639
8	HT1-6-07- 7613-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40640
9	HT1-6-07- 7614-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40641
10	HT1-6-07- 7615-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40642
11	HT1-6-07- 7616-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40643
12	HT1-6-07- 7617-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071538 C#40660 Conf. G071537 C#40714
13	HT1-6-07- 7618-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40644
14	HT1-6-07- 7619-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40645
15	HT1-6-07- 7621-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40646
16	HT1-6-07- 7622-5	8271440	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071537 C#40647
<b>TOTAL ft<sup>2</sup> =</b>					<b>184,000</b>					



**TABLE 1.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/21/2007  
 Date Reported: 12/26/2007  
 Client Sample ID: HT1-6-07-7604-5  
 Material Description: 60 mil HDPE Textured Geomembrane

QC'd By:   
 PGL Job No.: G071559  
 PGL Control No.: 40836

METHOD DESCRIPTION	SPECIMENS										Proj. Specs.				
	1	2	3	4	5	6	7	8	9	10					
ASTM D1505 Density (grams/cm.3)	0.9497	0.9497	0.9497									0.9497	0.9497	0.9497	
ASTM D638 Tensile Properties:	Test Specimens: Type IV, Width of narrow section: 0.25in, Length of narrow section: 1.3in, Width Overall: 0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2 °C (73.4+/-3.6 °F, and 50+/-5% relative humidity, Rate of Separation: 2"/min (HDPE) 2"/min (VLDPE/LLDPE)														
Tensile Strength at Yield (lbs/ in.-width)	MD 212	212	208	216	208										
	TD 216	212	208	215	210										
Tensile Strength at Break (lbs/ in.- width)	MD 282	284	272	276	268										
	TD 212	216	211	216	212										
Elongation at Yield (percent)	MD 17	18	18	18	19										
	TD 15	16	17	17	17										
Elongation at Break (percent)	MD 601	606	501	551	490										
	TD 423	501	490	551	538										
ASTM D1004 Tear Resistance (lbs)	Machine: Tensile machine equipped with constant rate of extension and chart recorder.														
Die C	MD 63	61	60	61	61	62	60	61	63	58					
	TD 60	57	58	59	61	63	61	61	58	58					
ASTM D1603 Carbon Black Content (percent)	2.45	2.43													
ASTM D1238 Melt Flow Index (grams/ 10 minutes)	Condition FR-190/2.16; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 °C and 2.16kg load.														
Procedure A	0.2300	0.2309	0.2159												
	0.2256	0.0084	0.2159	0.2309	0.2159	0.2159	0.2159	0.2159	0.2159	0.2159	0.2159	0.2159	0.2159	0.2159	0.2309



MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION  
 DC#1987 Record #268

**TABLE 1.**

**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/19/2007  
 Client Sample ID: HT1-6-07-7610-5  
 Material Description: 60 mil HDPE Textured Geomembrane

QC'd By: *SA*  
 PGL Job No.: G071538  
 PGL Control No.: 40659

METHOD	DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.			
		1	2	3	4	5	6	7	8	9	10								
ASTM D1505	Density (grams/cm.3)	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.0000	0.9490	0.9490	0.9490	0.9490	194	
ASTM D638	Tensile Properties:	Test Specimens: Type IV, Width of narrow section: 0.25in, Length of narrow section: 1.3in, Width Overall: 0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23±2 °C (73.4±3.6 °F, and 50±5% relative humidity. Rate of Separation: 2"/min (HDPE) 2"/min (VLDPE/LLDPE)																	
	Tensile Strength at Yield (lbs/ in.-width)	201	196	208	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
	MD	201	196	208	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
	TD	216	212	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
	Tensile Strength at Break (lbs/ in.- width)	258	252	264	260	248	248	248	248	248	248	248	248	248	248	248	248	248	248
	MD	258	252	264	260	248	248	248	248	248	248	248	248	248	248	248	248	248	248
	TD	184	196	195	199	188	188	188	188	188	188	188	188	188	188	188	188	188	188
	Elongation at Yield (percent)	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	MD	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	TD	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	Elongation at Break (percent)	530	510	501	545	496	496	496	496	496	496	496	496	496	496	496	496	496	496
	MD	530	510	501	545	496	496	496	496	496	496	496	496	496	496	496	496	496	496
	TD	315	451	430	465	389	389	389	389	389	389	389	389	389	389	389	389	389	389
ASTM D1004	Tear Resistance (lbs)	67	63	62	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61
Die C		67	63	62	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61
	Machine: Tensile machine equipped with constant rate of extension and chart recorder.	67	63	62	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61
ASTM D1603	Carbon Black Content (percent)	2.35	2.37	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35
	MD	2.35	2.37	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35
	TD	59	57	56	60	58	58	58	58	58	58	58	58	58	58	58	58	58	58
ASTM D1238	Melt Flow Index (grams/ 10 minutes)	63	63	62	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61
Procedure A		63	63	62	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61
	Condition FR-190/2.16., Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 °C and 2.16kg load.	63	63	62	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61
	0.2134	0.2187	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269
	0.2197	0.0068	0.2134	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269	0.2269



MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION  
 DC#1987 Record #268



**TABLE 2.**

**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/19/2007  
 Client Sample ID: HT1-6-07-7617-5  
 Material Description: 60 mil HDPE Textured Geomembrane

QC'd By: *AA*  
 PGL Job No.: G071538  
 PGL Control No.: 40660

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.	
	1	2	3	4	5	6	7	8	9	10						
ASTM D1505 Density (grams/cm.3)	0.9488	0.9488	0.9488									0.9488	0.0000	0.9488	0.9488	0.14
ASTM D638 Type IV Tensile Properties:	Test Specimens: Type IV, Width of narrow section: 0.25in, Length of narrow section: 1.3in, Width Overall: 0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23±2 °C (73.4±3.6 °F, and Gauge Length = 2.0 in. (GRI-GM13 Mod)															
Tensile Strength at Yield (lbs/ in.-width)	MD 214	228	224	215	219							220	6	214	228	126
	TD 208	217	209	212	210							211	3	208	217	
Tensile Strength at Break (lbs/ in.- width)	MD 259	236	264	262	229							250	16	229	264	90
	TD 223	241	199	219	214							219	15	199	241	
Elongation at Yield (percent)	MD 17	16	16	18	18							17	1	16	18	12
	TD 18	16	17	16	17							17	1	16	18	
Elongation at Break (percent)	MD 538	424	492	551	421							485	61	421	551	100
	TD 501	521	442	478	466							482	31	442	521	
ASTM D1004 Die C Tear Resistance (lbs)	Machine: Tensile machine equipped with constant rate of extension and chart recorder.															
	MD 64	62	62	62	61	60	61	63	60	59		61	1	59	64	42
	TD 54	57	55	58	53	56	57	58	55	53		56	2	53	58	
ASTM D1603 Carbon Black Content (percent)	2.37	2.41										2.39	0.03	2.37	2.41	2-3
ASTM D1238 Procedure A Melt Flow Index (grams/ 10 minutes)	Condition FR-190/2.16; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190 °C and 2.16kg load.															
	0.2078	0.2137	0.1901									0.2039	0.0123	0.1901	0.2137	

MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION  
 DC#1987 Record #268



**TEXTURED GEOMEMBRANE  
CQC CONFORMANCE DOCUMENTATION**

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1001-58

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST		REQUIRED TEST VALUE	CONFORMANCE TEST RESULT				
			Roll Number/Resin Batch Number				
			HTI-6-07-7604-5 8271440	HTI-6-07-7609-5 8271440	HTI-6-07-7612-5 8271440	HTI-6-07-7616-5 8271440	HTI-6-07-7621-5 8271440
Sheet Density (grams/cc) ASTM D 1505		≥ 0.94	0.948	0.948	0.948	0.948	0.948
Thickness <sup>(2)</sup> (mils) ASTM D 5994		≥ 60	60	61	60	61	61
Asperity (mil) GRI GM 12		≥ 10	22/21	23/22	23/23	22/23	21/23
Carbon Black Content (%) ASTM D 1603		2.0 to 3.0	2.5	2.4	2.3	2.4	2.5
Tensile Properties ASTM D 6693	Strength	≥ 126	175	176	177	176	176
	At Break, ppi	≥ 90	172	193	181	167	175
Tensile Properties ASTM D 6693	Elongation	≥ 12	18	18	19	19	18
	At Break, %	≥ 100	472	525	473	450	475
Puncture Resistance (pounds) ASTM D 4833		≥ 90	151	157	160	154	154
Tear Resistance (pounds) ASTM D 1004 Die C		≥ 42	55	57	57	54	55
Carbon Black Dispersion ASTM D 5596		Cat 1 or 2	1	1	1	1	1
NCTL (hrs.) ASTM D 5597		≥ 300	PASS	PASS	PASS	PASS	PASS
<b>APPROVED</b>			<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 16 rolls manufactured for the East Carolina Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

# POLYFLEX, INC.

1002834  
Material Pre-Certification List

Date:	12/4/2007	Material Type:	60HDST - Cust
Project Number:	277329	Material Quantity:	16
Customer/Project:	Republic / East Carolina Env	Completed by:	MH

#	Blend	Roll Number	Weight	Roll Description
1	8271440	HT1 - 6 - 07 - 7604 - 5	4,175	23' X 500' X .060HDST - Cust
2	8271440	HT1 - 6 - 07 - 7605 - 5	4,170	23' X 500' X .060HDST - Cust
3	8271440	HT1 - 6 - 07 - 7606 - 5	4,050	23' X 500' X .060HDST - Cust
4	8271440	HT1 - 6 - 07 - 7609 - 5	4,050	23' X 500' X .060HDST - Cust
5	8271440	HT1 - 6 - 07 - 7610 - 5	4,045	23' X 500' X .060HDST - Cust
6	8271440	HT1 - 6 - 07 - 7611 - 5	4,050	23' X 500' X .060HDST - Cust
7	8271440	HT1 - 6 - 07 - 7612 - 5	4,125	23' X 500' X .060HDST - Cust
8	8271440	HT1 - 6 - 07 - 7613 - 5	4,145	23' X 500' X .060HDST - Cust
9	8271440	HT1 - 6 - 07 - 7614 - 5	4,147	23' X 500' X .060HDST - Cust
10	8271440	HT1 - 6 - 07 - 7615 - 5	4,152	23' X 500' X .060HDST - Cust
11	8271440	HT1 - 6 - 07 - 7616 - 5	4,142	23' X 500' X .060HDST - Cust
12	8271440	HT1 - 6 - 07 - 7617 - 5	4,137	23' X 500' X .060HDST - Cust
13	8271440	HT1 - 6 - 07 - 7618 - 5	4,147	23' X 500' X .060HDST - Cust
14	8271440	HT1 - 6 - 07 - 7619 - 5	4,147	23' X 500' X .060HDST - Cust
15	8271440	HT1 - 6 - 07 - 7621 - 5	4,152	23' X 500' X .060HDST - Cust
16	8271440	HT1 - 6 - 07 - 7622 - 5	4,147	23' X 500' X .060HDST - Cust

# CERTIFICATION SHEET

# POLY-FLEX, INC.

2000 W. Marshall Drive  
Grand Prairie, Texas 75051

DATE: January 3, 2008

PROJECT NO: 277329

ORDER NO: Pre-Certification

TRIP NO: Pre-Certification

CERTIFIED BY: 

ROLL NUMBER	TEST DESCRIPTION	THICKNESS	CARBON BLACK	TEAR	PUNCTURE	TENSILE @ YIELD	ELONG @ YIELD	TENSILE @ BREAK	ELONG @ BREAK	CAR. BLK. DISPERSION	DENSITY	NCTL	OXIDATIVE INDUCTION TIME	ASPERTY HEIGHT	OVEN AGING	UV RESISTANCE
(modifications)		min	%	lb	lb	ppi	%	ppi	%	Cat 1or2	g/cc	hrs	min.	MILS	%	%
SPECIFICATION		60	2.0-3.0	42	90	126	12	90	100		0.940	300	100	10	80	50
BLEND																
HT1-6-07 7604-5	8271440	60	2.5	55	151	175	18	172	472	1	0.948	Pass	186	22 / 21	85	77
HT1-6-07 7605-5	8271440	60	2.5	55	151	175	18	172	472	1	0.948	Pass	186	21 / 23	85	77
HT1-6-07 7606-5	8271440	60	2.5	55	151	175	18	172	472	1	0.948	Pass	186	23 / 22	85	77
HT1-6-07 7609-5	8271440	61	2.4	57	157	176	18	193	525	1	0.948	Pass	186	23 / 22	85	77
HT1-6-07 7610-5	8271440	60	2.4	57	157	176	18	193	525	1	0.948	Pass	186	22 / 23	85	77
HT1-6-07 7611-5	8271440	60	2.4	57	157	176	18	193	525	1	0.948	Pass	186	24 / 23	85	77
HT1-6-07 7612-5	8271440	60	2.3	57	160	177	19	181	473	1	0.948	Pass	185	23 / 23	85	77
HT1-6-07 7613-5	8271440	61	2.3	57	160	177	19	181	473	1	0.948	Pass	185	23 / 21	85	77
HT1-6-07 7614-5	8271440	61	2.3	57	160	177	19	181	473	1	0.948	Pass	185	23 / 23	85	77
HT1-6-07 7615-5	8271440	61	2.3	57	160	177	19	181	473	1	0.948	Pass	185	24 / 23	85	77
HT1-6-07 7616-5	8271440	61	2.4	54	154	176	19	167	450	1	0.948	Pass	185	22 / 23	85	77
HT1-6-07 7617-5	8271440	61	2.4	54	154	176	19	167	450	1	0.948	Pass	185	23 / 22	85	77
HT1-6-07 7618-5	8271440	61	2.4	54	154	176	19	167	450	1	0.948	Pass	185	21 / 22	85	77
HT1-6-07 7619-5	8271440	61	2.4	54	154	176	19	167	450	1	0.948	Pass	185	23 / 21	85	77
HT1-6-07 7621-5	8271440	61	2.5	55	154	176	18	175	475	1	0.948	Pass	185	21 / 23	85	77
HT1-6-07 7622-5	8271440	61	2.5	55	154	176	18	175	475	1	0.948	Pass	185	23 / 23	85	77



## Certificate of Analysis

Shipped To: POLY AMERICA: GP (GEO)  
2000 W MARSHALL  
GRAND PRAIRIE TX 75051  
USA

CPC Delivery #: 87514721  
PO #: 273456  
Weight: 192500 LB  
Ship Date: 10/24/2007  
Package: BULK  
Mode: Hopper Car  
Car #: CHVX892016  
Seal No: 246441

Recipient: Averitte  
Fax:

Product:  
MARLEX POLYETHYLENE K308 BULK

NCTL, ASTM D5397-95 Appendix (modified), Avg: >500 Hours (not tested on each lot)

Lot Number: 8271440

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.08	g/10mi
HLMI Flow Rate	ASTM D1238	10.6	g/10mi
Density	ASTM D1505	0.937	g/cm3
Production Date		09/20/2007	

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.

  
Paul S. Newbold  
Quality Systems Coordinator

For CoA questions contact Tom Scheirman at 832-813-4637

**EXTRA ROLL OF GEOMEMBRANE USED IN CELL NO. 12  
CONSTRUCTION**

**CQC CONFORMANCE DOCUMENTATION**



# quality certificate

ROLL # **151113 03**

Lot #: **8230950**

Liner Type: **MICROSPIKE™ HDPE**

Measurement ASTM D-751/5994 (Modified)		METRIC	ENGLISH	Thickness.....	1.5 mm	60 mil
	MIN:	1.60 mm	63 <input checked="" type="checkbox"/> mil	Length.....	125 m	410.1 feet
	MAX:	1.95 mm	77 mil	Width.....	7.00 m	23.0 feet
Asperity GRI GM12:	31 <input checked="" type="checkbox"/> mil	AVE:	1.74 mm	69 mil		

**TEST RESULTS**

Specific Gravity ASTM D-792	Density	g/cc	.946
MFI ASTM D-1238 COND. E GRADE: <b>K307</b>	Melt Flow Index 190°C /2160 g	g/10 min	.26
Carbon Black Content ASTM D-1603/4218	Range	%	2.59
Carbon Black Dispersion ASTM D-5596	Category		1
Tensile Strength ASTM D-6693 ASTM D-638 (Modified) ( 2 inches / minute )	Average Strength @ Yield	ppi 171	2,490 psi
	Average Strength @ Break	ppi 223	3,257 psi
Elongation ASTM D-6693 ASTM D - 638 (Modified) ( 2 inches / minute ) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%	17.37
	Average Elongation @ Break	%	515.7
Dimensional Stability ASTM D-1204 (Modified)	Average Dimensional change	%	-.91
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	lbs.	57.364
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	lbs	102.712
Puncture Resistance ASTM D-4833 (Modified)	Load	lbs	147.500
ESCR ASTM D-1693	Minimum Hrs w/o Failures	1500 hrs	ONGOING
Notched Constant Tensile Load ASTM D-5397	pass / fail @ 30%	200 hrs (after 11/1/03, 300hrs)	ONGOING

CUSTOMER: **Republic Waste**  
 P.O.#: **None / Upper Piedmont Environmental**  
 DESTINATION **Rougemont, NC**

*ok - Harvey*

Date: **12-16-03**  
 Signature: *[Handwritten Signature]*  
 Quality Control Department

60MSDS.FRM  
 REV 04  
 3/16/01

**CQA CONFORMANCE DOCUMENTATION**

**TABLE 1.**

**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 3/18/2008  
 Date Reported: 3/22/2008  
 Client Sample ID: Roll #151113-03

QC'd By: *JAH*  
 PGL Job No.: G080152  
 PGL Control No.: 45600

Material Description: 60 mil HDPE Microspike Geomembrane

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.
	1	2	3	4	5	6	7	8	9	10					
ASTM D5994 Thickness (mils)	Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2 to the horizontal with the tip rounded to a radius of 0.8 +/- 0.1 mm (0.031 +/- 0.004 in), with a specified force of 0.56 +/- 0.05 N (2 +/- 0.2 oz)														
	Loading Time: 5 sec Specimen Size: 4" x 4"														
ASTM D1505 Density (grams/cm.3)	62	61	63	62	61	62	61	62	61	62	61	62	61	62	63
	0.9486 0.9486 0.9486 0.9486														
ASTM D638 Type IV Tensile Properties:	Test Specimens: Type IV, Width of narrow section: 0.25in, Length of narrow section: 1.3in, Width Overall: 0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23 +/- 2° C (73.4 +/- 3.6° F, and 50 +/- 5% relative humidity. Rate of Separation: 2"/min (HDPE) 2"/min (VLDPE/LLDPE)														
	Tensile Strength at Yield (lbs/in.-width)														
MD	188	197	200	209	214	214	214	214	214	214	214	214	214	214	214
TD	198	215	218	214	200	200	200	200	200	200	200	200	200	200	218
	Tensile Strength at Break (lbs/in.- width)														
MD	248	237	239	300	294	294	294	294	294	294	294	294	294	294	300
TD	226	218	228	204	212	212	212	212	212	212	212	212	212	212	228
	Elongation at Yield (percent)														
MD	18	21	21	21	21	21	21	21	21	21	21	21	21	21	21
TD	18	17	17	17	18	18	18	18	18	18	18	18	18	18	18
	Elongation at Break (percent)														
MD	467	430	488	476	455	455	455	455	455	455	455	455	455	455	488
TD	524	500	499	446	530	530	530	530	530	530	530	530	530	530	530
ASTM D1004 Die C Tear Resistance (lbs)	Machine: Tensile machine equipped with constant rate of extension and chart recorder														
MD	59	58	64	62	60	57	55	64	62	63	64	62	62	62	64
TD	51	50	55	54	63	51	55	55	55	51	55	65	65	65	65
	Carbon Black Content (percent)														
	2.39 2.43														
ASTM D1238 Procedure A Melt Flow Index (grams/ 10 minutes)	Condition FR-190/2.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190° C and 2.16kg load														
	0.2609 0.2610 0.2529														
	0.2583 0.0046 0.2529 0.2610														

*OK - review*



**TRANSFER ROLLS OF GEOMEMBRANE USED IN CELL  
NO. 12 CONSTRUCTION**

The following 2 geomembrane rolls were transferred from Uwharrie Regional Landfill - Cell No.12, to East Carolina Landfill – Cell No.12.

1. HT1-6-07-7522-5
2. HT1-6-07-7547-5

Attached is a summary of manufacturer CQC and CQA conformance test results.

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

**Project Name:** Uwharrie Cell #12 Lf

**Material:** 60 mil HDPE Textured Geomembrane

**TYPE OF MQA:** LEVEL (2)

**QA by:** SA

**Manufacturer:** Poly-Flex

**SAMPLING FREQUENCY:** Every Roll for Thickness

**Cube Root of the Total Number of Rolls for Conformance**

**Location:** TX

**Rec 244, DC # 1972**

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No/Control No
1	HT1-6-07- 7520-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40574
2	HT1-6-07- 7521-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40575
3	HT1-6-07- 7522-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40576
4	HT1-6-07- 7523-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40577
5	HT1-6-07- 7525-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40578
6	HT1-6-07- 7526-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40579
7	HT1-6-07- 7527-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40580
8	HT1-6-07- 7528-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40581
9	HT1-6-07- 7529-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40582
10	HT1-6-07- 7530-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40583
11	HT1-6-07- 7531-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071540 C#40665 Conf.
12	HT1-6-07- 7533-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40584
13	HT1-6-07- 7534-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40585
14	HT1-6-07- 7536-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40586
15	HT1-6-07- 7537-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40587
16	HT1-6-07- 7538-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40588
17	HT1-6-07- 7540-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40589
18	HT1-6-07- 7541-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40590
19	HT1-6-07- 7542-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40591
20	HT1-6-07- 7543-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40592
										G071534 C#40593

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

Project Name: Uwharrie Cell #12 Lf

TYPE OF MQA: LEVEL (2)

QA by: 

Material: 60 mil HDPE Textured Geomembrane

SAMPLING FREQUENCY: Every Roll for Thickness

Manufacturer: Poly-Flex

Cube Root of the Total Number of Rolls for Conformance

Location: TX

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No./Control No
21	HT1-6-07- 7544-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40594
22	HT1-6-07- 7545-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40595
23	HT1-6-07- 7546-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40596
24	HT1-6-07- 7547-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40597
25	HT1-6-07- 7548-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40598
26	HT1-6-07- 7549-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40599
27	HT1-6-07- 7550-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40600 G071540 C#40666 Conf.
28	HT1-6-07- 7551-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40601
29	HT1-6-07- 7553-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40602
30	HT1-6-07- 7554-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071534 C#40603
31	HT1-6-07- 7555-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40604
32	HT1-6-07- 7556-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40605
33	HT1-6-07- 7557-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40606
34	HT1-6-07- 7558-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40607
35	HT1-6-07- 7559-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40608
36	HT1-6-07- 7560-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40609
37	HT1-6-07- 7561-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40610
38	HT1-6-07- 7562-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40611 G071535 C#40612
39	HT1-6-07- 7563-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071540 C#40667 Conf.
40	HT1-6-07- 7564-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40613

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

Project Name: Uwharrie Cell #12 Lf

TYPE OF MQA: LEVEL (2)

QA by: JA

Material: 60 mil HDPE Textured Geomembrane

SAMPLING FREQUENCY: Every Roll for Thickness

Manufacturer: Poly-Flex

Cube Root of the Total Number of Rolls for Conformance

Location: TX

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No/Control No
41	HT1-6-07- 7565-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40614
42	HT1-6-07- 7566-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40615
43	HT1-6-07- 7567-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40715
44	HT1-6-07- 7568-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40616
45	HT1-6-07- 7569-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40617
46	HT1-6-07- 7570-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40618
47	HT1-6-07- 7571-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40619
48	HT1-6-07- 7572-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40620
49	HT1-6-07- 7573-5	8271517	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40621
<b>Sub Total ft<sup>2</sup> =</b>					<b>563500</b>					
50	HT1-6-07- 7574-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40622
51	HT1-6-07- 7575-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40623
52	HT1-6-07- 7576-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40624
53	HT1-6-07- 7577-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40625
54	HT1-6-07- 7578-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40626
55	HT1-6-07- 7579-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40627
56	HT1-6-07- 7580-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40628
57	HT1-6-07- 7581-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40629
58	HT1-6-07- 7582-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40630
59	HT1-6-07- 7583-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40631
60	HT1-6-07- 7584-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071535 C#40632 G071540 C#40713 Conf.

**MANUFACTURING QA IN-PLANT SAMPLING/INSPECTION REPORT**

Project Name: Uwharrie Cell #12 Lf

TYPE OF MQA: LEVEL (2)

QA by: SA

Material: 60 mil HDPE Textured Geomembrane

SAMPLING FREQUENCY: Every Roll for Thickness

Manufacturer: Poly-Flex

**Cube Root of the Total Number of Rolls for Conformance**

Location: TX

Rec 244, DC # 1972

No.	Roll #	Batch No.	Length ft.	Width ft.	Area ft <sup>2</sup>	Date Manufactured	Sampled by	Date Sampled	Date Received	Reference Job No./Control No	
61	HT1-6-07- 7588-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40648	
62	HT1-6-07- 7587-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40649	
63	HT1-6-07- 7588-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40650	
64	HT1-6-07- 7589-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40651	
65	HT1-6-07- 7590-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40652	
66	HT1-6-07- 7591-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40653 J080001 C#35221 Conf.	
67	HT1-6-07- 7592-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40654	
68	HT1-6-07- 7593-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40655	
69	HT1-6-07- 7594-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40656	
70	HT1-6-07- 7595-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40657	
71	HT1-6-07- 7596-5	8271519	500	23	11500	12/4/2007	RK	N/A	12/13/2007	G071536 C#40658	
					<b>Sub Total ft<sup>2</sup> =</b>	<b>253000</b>					
72	HT1-6-08- 6066-5	2871804	500	23	11500	N/A	RK	N/A	3/31/2008	G080226 C#45897 G080229 In Progress	
73	HT1-6-08- 6067-5	2871804	500	23	11500	N/A	RK	N/A	3/31/2008	G080226 C#45898	
74	HT1-6-08- 6068-5	2871804	500	23	11500	N/A	RK	N/A	3/31/2008	G080226 C#45899	
75	HT1-6-08- 6071-5	2871804	500	23	11500	N/A	RK	N/A	3/31/2008	G080226 C#45900 G080226 C#45901	
76	HT1-6-08- 6072-5	2871804	500	23	11500	N/A	RK	N/A	3/31/2008	G080229 In Progress	
					<b>Sub Total ft<sup>2</sup> =</b>	<b>57500</b>					
					<b>TOTAL ft<sup>2</sup> =</b>	<b>874,000</b>					

**CQC CONFORMANCE DOCUMENTATION**

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST		REQUIRED TEST VALUE	CONFORMANCE TEST RESULT					
			Roll Number/Resin Batch Number					
			HT1-6-07-7520-5 8271517	HT1-6-07-7525-5 8271517	HT1-6-07-7528-5 8271517	HT1-6-07-7533-5 8271517	HT1-6-07-7536-5 8271517	
Thickness (mils) ASTM D 5994		≥ 60	60	60	60	61	60	
Carbon Black Content (%) ASTM D 1603		2 to 3	2.7	2.7	2.6	2.7	2.6	
Tear Resistance (pounds) ASTM D 1004 Die C		≥ 42	57	54	56	57	57	
Puncture Resistance (pounds) ASTM D 4833		≥ 90	152	154	152	158	149	
Tensile Properti. ASTM D 638	Strength	At Yield, ppi	≥ 126	171	168	171	174	171
		At Break, ppi	≥ 90	164	180	178	192	174
Tensile Properties ASTM D 638	Elongation	At Yield, %	≥ 12	19	18	17	19	19
		At Break, %	≥ 100	394	502	460	515	472
Carbon Dispersion (Category) ASTM D 5596		Cat 1 or 2	1	1	1	1	1	
Sheet Density (grams/cc) ASTM D 1505		≥ 0.94	0.948	0.947	0.947	0.947	0.947	
NCTL (hrs.) ASTM D 5397		≥ 300	PASS	PASS	PASS	PASS	PASS	
Asperity Height (mils) GRI GM 12		≥ 10	24/24	20/20	20/20	21/23	21/21	
<b>PROVED</b>			<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	

NOTE: All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST		REQUIRED TEST VALUE	CONFORMANCE TEST RESULT					
			Roll Number/Resin Batch Number					
			HT1-6-07-7540-5 8271517	HT1-6-07-7544-5 8271517	HT1-6-07-7548-5 8271517	HT1-6-07-7553-5 8271517	HT1-6-07-7556-5 8271517	
Thickness (mils) ASTM D 5994		≥ 60	60	61	60	60	60	
Carbon Black Content (%) ASTM D 1603		2 to 3	2.2	2.6	2.6	2.5	2.6	
Tear Resistance (pounds) ASTM D 1004 Die C		≥ 42	54	53	54	59	57	
Puncture Resistance (pounds) ASTM D 4833		≥ 90	158	155	153	153	153	
Tensile Propert. ASTM D 638	Strength	At Yield, ppi	≥ 126	167	163	163	185	181
		At Break, ppi	≥ 90	167	162	170	175	171
Tensile Properties ASTM D 638	Elongation	At Yield, %	≥ 12	18	18	18	17	18
		At Break, %	≥ 100	477	420	446	457	469
Carbon Dispersion (Category) ASTM D 5596		Cat 1 or 2	1	1	1	1	1	
Sheet Density (grams/cc) ASTM D 1505		≥ 0.94	0.948	0.948	0.948	0.948	0.948	
NCTL (hrs.) ASTM D 5397		≥ 300	PASS	PASS	PASS	PASS	PASS	
Asperity Height (mils) GRI GM 12		≥ 10	21/23	19/19	19/19	25/25	24/25	
<b>PROVED</b>			<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	

NOTE: All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**SUMMARY OF MANUFACTURER (CQC) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST			REQUIRED TEST VALUE	CONFORMANCE TEST RESULT				
				Roll Number/Resin Batch Number				
				HT1-6-07-7560-5 8271517	HT1-6-07-7565-5 8271517	HT1-6-07-7568-5 8271517	HT1-6-07-7572-5 8271517	HT1-6-07-7576-5 8271519
Thickness (mils) ASTM D 5994			≥ 60	61	61	60	61	60
Carbon Black Content (%) ASTM D 1603			2 to 3	2.3	2.5	2.5	2.5	2.6
Tear Resistance (pounds) ASTM D 1004 Die C			≥ 42	57	55	57	57	56
Puncture Resistance (pounds) ASTM D 4833			≥ 90	157	154	155	155	153
Tensile Properti. ASTM D 638	Strength	At Yield, ppi	≥ 126	175	174	181	177	177
		At Break, ppi	≥ 90	164	157	178	164	141
Tensile Properties ASTM D 638	Elongation	At Yield, %	≥ 12	18	18	18	18	18
		At Break, %	≥ 100	378	397	503	450	351
Carbon Dispersion (Category) ASTM D 5596			Cat 1 or 2	1	1	1	1	1
Sheet Density (grams/cc) ASTM D 1505			≥ 0.94	0.947	0.947	0.948	0.948	0.948
NCTL (hrs.) ASTM D 5397			≥ 300	PASS	PASS	PASS	PASS	PASS
Asperity Height (mils) GRI GM 12			≥ 10	20/20	19/19	19/19	24/23	23/22
<b>APPROVED</b>				<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE: All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) and Asperity Height (GRI GM12) requirements. The resin lots passed NCTL testing.

**CQA CONFORMANCE DOCUMENTATION**

**SUMMARY OF MANUFACTURER (CQA) CONFORMANCE TEST RESULTS  
HDPE GEOMEMBRANE**

UWHARRIE REGIONAL MSW LANDFILL  
MONTGOMERY COUNTY, NORTH CAROLINA  
CONSTRUCTION QUALITY ASSURANCE - CQA CELL NO. 12  
Bunnell-Lammons Engineering, Inc. Project No. J07-1002-78

Material: 60 mil Textured HDPE Geomembrane  
Manufacturer: Poly-Flex, Inc.

CONFORMANCE TEST (2)	REQUIRED TEST VALUE	CONFORMANCE TEST RESULT			
		HTI-6-07-7530-5 8271517	HTI-6-07-7550-5 8271517	HTI-6-07-7563-5 8271517	HTI-6-07-7584-5 8271519
Thickness (mils) ASTM D 5994	≥ 60	61	61	61	61
Sheet Density (grams/cc) ASTM D 1505	≥ 0.94	0.9486	0.9481	0.9488	0.9486
Carbon Black Content (%) ASTM D 1603	2 to 3	2.33	2.37	2.36	2.36
Tensile Properties ASTM D 638	Strength ⊖ At Yield, ppi At Break, ppi	196/201	200/209	195/192	188/182
		242/210	245/211	244/195	250/187
Tensile Properties ASTM D 638	Elongation ⊖ At Yield, % At Break, %	17/17	17/16	17/16	17/17
		559/481	546/465	544/452	541/432
Tear Resistance (lbs) ASTM D 1004	≥ 42	56/59	59/59	58/59	59/60
Melt Index (grams/10 minutes) ASTM D 1238	NONE	0.2517	0.2409	0.2310	0.2402
<b>APPROVED</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>

NOTE (1): Test values are machine direction / transverse direction

NOTE (2): All 71 rolls manufactured for the Uwharrie Regional MSW Landfill project meet Thickness (ASTM D5994) requirements.

**APPENDIX G**

**GEOMEMBRANE (Flexible Membrane Liner, FML)  
CQA & CQC Construction Documentation**

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

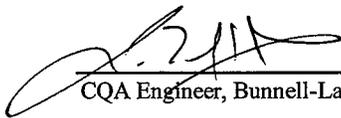
EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers: S-1 to S-22

  
\_\_\_\_\_  
Geomembrane Installer, A.E.G.

3-10-08  
\_\_\_\_\_  
Date

 TED STILES  
\_\_\_\_\_  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

3-10-08  
\_\_\_\_\_  
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

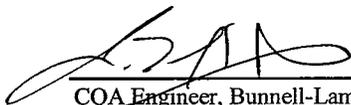
EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers: S-23 to S-36  
T-1 T-22

  
\_\_\_\_\_  
Geomembrane Installer, A.E.G.

3-11-08  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

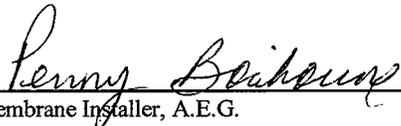
3-11-08  
\_\_\_\_\_  
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers: S-37 to S-53  
T-23 T-39

  
\_\_\_\_\_  
Geomembrane Installer, A.E.G.

3-12-08  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

3-12-08  
\_\_\_\_\_  
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

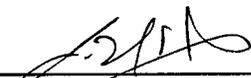
EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers:  $\frac{S-54}{T-40}$  to  $\frac{S-56}{T-70}$

  
\_\_\_\_\_  
Geomembrane Installer, A.E.G.

$\frac{3-13-08}{}$   
\_\_\_\_\_  
Date

 TED STILES  
\_\_\_\_\_  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

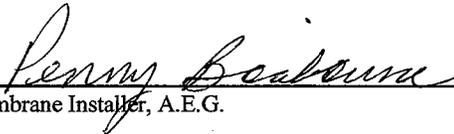
$\frac{3-13-08}{}$   
\_\_\_\_\_  
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers:  $\frac{T-71}{S-57}$  to  $\frac{T-86}{S-60}$

  
\_\_\_\_\_  
Geomembrane Installer, A.E.G.

$\frac{3-14-08}{}$   
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

$\frac{3-14-08}{}$   
\_\_\_\_\_  
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers:     S-61     to     S-67    

*Penny Bourbaine*  
Geomembrane Installer, A.E.G.

    3-19-08      
Date

*TED STILES*  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

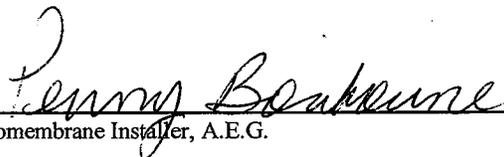
    3-19-08      
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

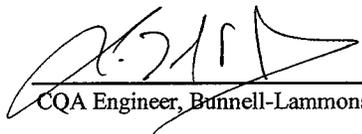
EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers:  $\frac{S-68}{T-87}$  to  $\frac{S-104}{T-90}$

  
Geomembrane Installer, A.E.G.

$\frac{3-21-08}{}$   
Date

 TED STILES  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

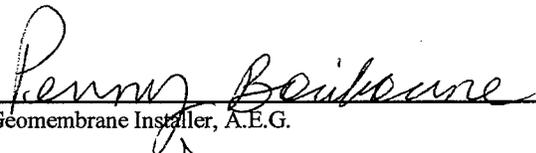
$\frac{3-21-08}{}$   
Date

# ACCEPTANCE OF GEOMEMBRANE SUBGRADE

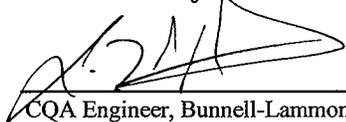
EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

The following signatures indicate the certification and acceptance of the surface condition of the compacted soil liner for placement of the geomembrane in accordance with the CQA Plan and Project Specifications.

Panel Numbers: T-91 to T-100

  
\_\_\_\_\_  
Geomembrane Installer, A.E.G.

3-22-08  
\_\_\_\_\_  
Date

 TED STILES  
\_\_\_\_\_  
CQA Engineer, Bunnell-Lammons Engineering, Inc. Representative

3-22-08  
\_\_\_\_\_  
Date

**TABLE NO. 1**  
**PANEL IDENTIFICATION**

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
\_\_\_\_\_

DATE: 3-11-08

SHEET 1; PAGE 1 OF 2

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

*TEXTURED*

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T1	HT1-6-07-7612-5		68	1530	Cell Floor/East Berm West Berm / <u>North Berm</u>
T2	HT1-6-07-7612-5		67	1507	Cell Floor/East Berm West Berm / <u>North Berm</u>
T3	HT1-6-07-7612-5		67	1507	Cell Floor/East Berm West Berm / <u>North Berm</u>
T4	HT1-6-07-7612-5		68	1530	Cell Floor/East Berm West Berm / <u>North Berm</u>
T5	HT1-6-07-7612-5		69	1552	Cell Floor/East Berm West Berm / <u>North Berm</u>
T6	HT1-6-07-7612-5		70	1575	Cell Floor/East Berm West Berm / <u>North Berm</u>
T7	HT1-6-07-7606-5		72	1620	Cell Floor/East Berm West Berm / <u>North Berm</u>
T8	HT1-6-07-7606-5		73	1642	Cell Floor/East Berm West Berm / <u>North Berm</u>
T9	HT1-6-07-7606-5		73	1642	Cell Floor/East Berm West Berm / <u>North Berm</u>
T10	HT1-6-07-7606-5		74	1605	Cell Floor/East Berm West Berm / <u>North Berm</u>
T11	HT1-6-07-7606-5		77	1732	Cell Floor/East Berm West Berm / <u>North Berm</u>

\* See As-Built Drawings for any deviations of panel length and placement.

17502 SQ FT: Total Panel Area This Page

0 SQ FT: Previous Total Panel Area

17502 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-11-08

SHEET 1; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

*TEXTURED*

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T12	HT1-6-07-7606-5		77	1732	Cell Floor/East Berm West Berm / <u>North Berm</u>
T13	HT1-6-07-7621-5		78	1755	Cell Floor/East Berm West Berm / <u>North Berm</u>
T14	HT1-6-07-7621-5		82	1845	Cell Floor/East Berm West Berm / <u>North Berm</u>
T15	HT1-6-07-7621-5		82	1845	Cell Floor/East Berm West Berm / <u>North Berm</u>
T16	HT1-6-07-7621-5		83	1867	Cell Floor/East Berm West Berm / <u>North Berm</u>
T17	HT1-6-07-7621-5		85	1912	Cell Floor/East Berm West Berm / <u>North Berm</u>
T18	HT1-6-07-7604-5		85	1912	Cell Floor/East Berm West Berm / <u>North Berm</u>
T19	HT1-6-07-7604-5		88	1980	Cell Floor/East Berm West Berm / <u>North Berm</u>
T20	HT1-6-07-7604-5		89	2002	Cell Floor/East Berm West Berm / <u>North Berm</u>
T21	HT1-6-07-7604-5		89	2002	Cell Floor/East Berm West Berm / <u>North Berm</u>
T22	HT1-6-07-7604-5		84	1890	Cell Floor/East Berm West Berm / <u>North Berm</u>

\* See As-Built Drawings for any deviations of panel length and placement.

20742 SQ FT: Total Panel Area This Page

17502 SQ FT: Previous Total Panel Area

38244 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
\_\_\_\_\_

DATE: 3-12-08

SHEET 1; PAGE 1 OF 2

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T 23	HT1-6-07-7616-5	SOUTH SLOPE	59	1328	Cell Floor/East Berm West Berm / North Berm
T 24	HT1-6-07-7616-5		61	1373	Cell Floor/East Berm West Berm / North Berm
T 25	HT1-6-07-7616-5		61	1373	Cell Floor/East Berm West Berm / North Berm
T 26	HT1-6-07-7616-5		67	1508	Cell Floor/East Berm West Berm / North Berm
T 27	HT1-6-07-7616-5		66	1485	Cell Floor/East Berm West Berm / North Berm
T 28	HT1-6-07-7616-5		69	1553	Cell Floor/East Berm West Berm / North Berm
T 29	HT1-6-07-7616-5		69	1553	Cell Floor/East Berm West Berm / North Berm
T 30	HT1-6-07-7613-5		71	1598	Cell Floor/East Berm West Berm / North Berm
T 31	HT1-6-07-7613-5		73	1643	Cell Floor/East Berm West Berm / North Berm
T 32	HT1-6-07-7613-5		71	1598	Cell Floor/East Berm West Berm / North Berm
T 33	HT1-6-07-7613-5		73	1643	Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

16655 SQ FT: Total Panel Area This Page

38244 SQ FT: Previous Total Panel Area

54899 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-12-08

SHEET 1; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T34	HT1-6-07-763-5	SOUTH SLOPE	73	1643	Cell Floor/East Berm West Berm / North Berm
T35	HT1-6-07-763-5		77	1733	Cell Floor/East Berm West Berm / North Berm
T36	HT1-6-07-7605-5		79	1778	Cell Floor/East Berm West Berm / North Berm
T37	HT1-6-07-7605-5		79	1778	Cell Floor/East Berm West Berm / North Berm
T38	HT1-6-07-7605-5		80	1800	Cell Floor/East Berm West Berm / North Berm
T39	HT1-6-07-7605-5		83	1868	Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

10600 SQ FT: Total Panel Area This Page

54899 SQ FT: Previous Total Panel Area

65499 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
\_\_\_\_\_

DATE: 3-13-08

SHEET 1; PAGE 1 OF 3

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T40	HT1-6-07-7618-5		94	2115	Cell Floor/East Berm West Berm / <u>North Berm</u>
T41	HT1-6-07-7618-5		94	2115	Cell Floor/East Berm West Berm / <u>North Berm</u>
T42	HT1-6-07-7618-5		96	2160	Cell Floor/East Berm West Berm / <u>North Berm</u>
T43	HT1-6-07-7618-5		98	2205	Cell Floor/East Berm West Berm / <u>North Berm</u>
T44	HT1-6-07-7610-5		99	2228	Cell Floor/East Berm West Berm / <u>North Berm</u>
T45	HT1-6-07-7610-5		100	2250	Cell Floor/East Berm West Berm / <u>North Berm</u>
T46	HT1-6-07-7610-5		102	2295	Cell Floor/East Berm West Berm / <u>North Berm</u>
T47	HT1-6-07-7610-5		104	2340	Cell Floor/East Berm West Berm / <u>North Berm</u>
T48	HT1-6-07-7615-5		105	2363	Cell Floor/East Berm West Berm / <u>North Berm</u>
T49	HT1-6-07-7615-5		106	2385	Cell Floor/East Berm West Berm / <u>North Berm</u>
T50	HT1-6-07-7615-5		105	2363	Cell Floor/East Berm West Berm / <u>North Berm</u>

\* See As-Built Drawings for any deviations of panel length and placement.

24819 SQ FT: Total Panel Area This Page

65499 SQ FT: Previous Total Panel Area

90318 SQ FT: Cumulative Panel Area

## PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-13-08

SHEET 1; PAGE 2 OF 3

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T51	HT1-6-07-7615-5		94	2115	Cell Floor/ <del>East Berm</del> West Berm / <u>North Berm</u>
T52	HT1-6-07-7611-5		71	1598	Cell Floor/ <del>East Berm</del> West Berm / <u>North Berm</u>
T53	HT1-6-07-7611-5		43	968	Cell Floor/ <del>East Berm</del> West Berm / <u>North Berm</u>
T54	HT1-6-07-7611-5		59	1328	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T55	HT1-6-07-7611-5		93	2093	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T56	HT1-6-07-7611-5		12	270	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T57	HT1-6-07-7611-5		111	2498	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T58	HT1-6-07-7611-5		111	2498	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T59	HT1-6-07-7614-5		118	2655	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T60	HT1-6-07-7614-5		124	2790	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T61	HT1-6-07-7614-5		120	2700	Cell Floor/ <del>East Berm</del> West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement

21513 SQ FT: Total Panel Area This Page  
90318 SQ FT: Previous Total Panel Area  
111,831 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-13-08

SHEET 1; PAGE 3 OF 3

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T62	HT1-6-07-7619-5		121	2723	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T63	HT1-6-07-7619-5		123	2768	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T64	HT1-6-07-7619-5		128	2880	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T65	HT1-6-07-7622-5		129	2903	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T66	HT1-6-07-7622-5		133	2993	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T67	HT1-6-07-7622-5		136	3060	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T68	HT1-6-07-7609-5		143	3218	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T69	HT1-6-07-7609-5		149	3353	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T70	HT1-6-07-7609-5		155	3488	Cell Floor/ <u>East Berm</u> West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

27386 SQ FT: Total Panel Area This Page  
111,831 SQ FT: Previous Total Panel Area  
139,217 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-14-08

SHEET 1; PAGE 1 OF 2

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T71	HTI-6-07-7617-5		94	2115	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T72	HTI-6-07-7617-5		143	3218	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T73	HTI-6-07-7617-5		144	3240	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T74	15113	AGRU AMERICA ROLL	144	3240	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T75	HTI-6-07-7603-5		147	3308	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T76	HTI-6-07-7617-5		127	2858	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T77	HTI-6-07-7619-5		109	2453	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T78	HTI-6-07-7605-5		11	248	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T79	HTI-6-07-7621-5		43	968	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T80	HTI-6-07-7618-5		12	270	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T81	HTI-6-07-7614-5		111	2498	Cell Floor/ <u>East Berm</u> West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

24416 SQ FT: Total Panel Area This Page  
139,217 SQ FT: Previous Total Panel Area  
163,633 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-14-08

SHEET 1; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T82	HT1-6-07-7614-5		8	180	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T83	15113	SOUTH SLOPE AGRV AMERICA ROLL	83	1868	Cell Floor/East Berm West Berm / North Berm
T84	HT1-6-07-7614-5		11	248	Cell Floor/ <u>East Berm</u> West Berm / North Berm
T85	HT1-6-07-7622-5	SOUTH SLOPE	78	1755	Cell Floor/East Berm West Berm / North Berm
T86	HT1-6-07-7618-5		11	248	Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

4299 SQ FT: Total Panel Area This Page  
163,133 SQ FT: Previous Total Panel Area  
167,932 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith  
Stanley Kramel

DATE: 3-21-08

SHEET 1; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T-87	HT1-6-07-6610-5		46	1035	Cell Floor/East Berm <del>West Berm</del> / North Berm
T-88	HT1-6-07-7612-5		10	225	Cell Floor/East Berm <del>West Berm</del> / North Berm
T-89	HT1-6-07-7612-5		10	225	Cell Floor/East Berm <del>West Berm</del> / North Berm
T-90	HT1-6-07-7618-5		30	675	Cell Floor/East Berm <del>West Berm</del> / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

2,160 SQ FT: Total Panel Area This Page  
167,932 SQ FT: Previous Total Panel Area  
170,092 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-22-08

SHEET 1; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
T-91	HT1-6-07-7522-5	SOUTH SLOPE	87	1958	Cell Floor/East Berm West Berm / North Berm
T-92	HT1-6-07-7522-5		53	1260	Cell Floor/East Berm West Berm / North Berm
T-93	HT1-6-07-7522-5		30	675	Cell Floor/East Berm West Berm / North Berm
T-94	HT1-6-07-7522-5		30	675	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T-95	HT1-6-07-7522-5		48	1080	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T-96	HT1-6-07-7522-5		73	1642	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T-97	HT1-6-07-7522-5		93	2093	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T-98	HT1-6-07-7547-5		68	1530	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T-99	HT1-6-07-7547-5		48	1080	Cell Floor/ <del>East Berm</del> West Berm / North Berm
T-100	HT1-6-07-7547-5		N/A	233	Cell Floor/ <del>East Berm</del> West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

12,226 SQ FT: Total Panel Area This Page

170,092 SQ FT: Previous Total Panel Area

182,318 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-10-08

SHEET 1; PAGE 1 OF 2

GEOMEMBRANE DESCRIPTION:  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

SMOOTH

TABLE 1  
 PANEL IDENTIFICATION / PLACEMENT

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S1	HS2-6-07-6116-05		346	7785	Cell Floor/East Berm West Berm / North Berm
S2	HS2-6-07-6116-05		154	3465	Cell Floor/East Berm West Berm / North Berm
S3	HS2-6-07-6119-05		195	4387	Cell Floor/East Berm West Berm / North Berm
S4	HS2-6-07-6119-05		239	5377	Cell Floor/East Berm West Berm / North Berm
S5	HS2-6-07-6105-5		115	2587	Cell Floor/East Berm West Berm / North Berm
S6	HS2-6-07-6105-5		357	8032	Cell Floor/East Berm West Berm / North Berm
S7	HS2-6-07-6111-05		359	8077	Cell Floor/East Berm West Berm / North Berm
S8	HS2-6-07-6111-05		136	3060	Cell Floor/East Berm West Berm / North Berm
S9	HS2-6-07-6110-05		231	5197	Cell Floor/East Berm West Berm / North Berm
S10	HS2-6-07-6110-05		271	6097	Cell Floor/East Berm West Berm / North Berm
S11	HS2-6-07-6112-05		98	2205	Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

56269 SQ FT: Total Panel Area This Page

0 SQ FT: Previous Total Panel Area

56269 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_

DATE: 3-10-08

SHEET 1; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

SMOOTH

TABLE 1  
 PANEL IDENTIFICATION / PLACEMENT

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S12	HS2-6-07-6112-05		378	8505	Cell Floor/East Berm West Berm / North Berm
S13	HS2-6-07-6121-05		378	8505	Cell Floor/East Berm West Berm / North Berm
S14	HS2-6-07-6121-05		126	2835	Cell Floor/East Berm West Berm / North Berm
S15	HS2-6-07-6118-05		267	6007	Cell Floor/East Berm West Berm / North Berm
S16	HS2-6-07-6118-05		237	5332	Cell Floor/East Berm West Berm / North Berm
S17	HS2-6-07-6100-05		154	3465	Cell Floor/East Berm West Berm / North Berm
S18	HS2-6-07-6100-05		349	7852	Cell Floor/East Berm West Berm / North Berm
S19	HS2-6-07-6107-05		41	922	Cell Floor/East Berm West Berm / North Berm
S20	HS2-6-07-6107-05		396	8910	Cell Floor/East Berm West Berm / North Berm
S21	HS2-6-07-6120-05	100' cut off, due to Forklift damage	401	9022	Cell Floor/East Berm West Berm / North Berm
S22	HS2-6-07-6102-05		409	9202	Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

70557 SQ FT: Total Panel Area This Page

56269 SQ FT: Previous Total Panel Area

126826 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith  
\_\_\_\_\_

DATE: 3-11-08

SHEET 1; PAGE 1 OF 2.

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SMOOTH

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S23	H52-6-07-6102-5		64	1440	Cell Floor/East Berm West Berm / North Berm
S24	H52-6-07-6106-5		348	7830	Cell Floor/East Berm West Berm / North Berm
S25	H52-6-07-6106-5		114	2565	Cell Floor/East Berm West Berm / North Berm
S26	H52-6-07-6114-5		304	6840	Cell Floor/East Berm West Berm / North Berm
S27	H52-6-07-6114-5		201	4522	Cell Floor/East Berm West Berm / North Berm
S28	H52-6-07-6087-5		222	4995	Cell Floor/East Berm West Berm / North Berm
S29	H52-6-07-6087-5		279	6277	Cell Floor/East Berm West Berm / North Berm
S30	H52-6-07-6092-5		143	3217	Cell Floor/East Berm West Berm / North Berm
S31	H52-6-07-6092-5		253	7942	Cell Floor/East Berm West Berm / North Berm
S32	H52-6-07-6115-5		69	1552	Cell Floor/East Berm West Berm / North Berm
S33	H52-6-07-6115-5		433	9742	Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

56922 SQ FT: Total Panel Area This Page

126820 SQ FT: Previous Total Panel Area

183748 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
\_\_\_\_\_

DATE: 3-11-08

SHEET 1; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

*SMOOTH*

TABLE 1  
PANEL IDENTIFICATION / PLACEMENT

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S34	H52-6-07-6117-5		436	9810	<u>Cell Floor</u> /East Berm West Berm / North Berm
S35	H52-6-07-6117-5		69	1552	<u>Cell Floor</u> /East Berm West Berm / North Berm
S36	H52-6-07-6095-5		373	8392	<u>Cell Floor</u> /East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

19754 SQ FT: Total Panel Area This Page

183748 SQ FT: Previous Total Panel Area

203502 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
\_\_\_\_\_

DATE: 3-12-08

SHEET 1; PAGE 1 OF 2

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 1  
PANEL IDENTIFICATION / PLACEMENT

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S37	HSI-6-07-6084-5		391	8798	<del>Cell Floor</del> /East Berm West Berm / North Berm
S38	HSI-6-07-6084-5		114	2565	<del>Cell Floor</del> /East Berm West Berm / North Berm
S39	HSI-6-07-6091-5		283	6368	<del>Cell Floor</del> /East Berm West Berm / North Berm
S40	HSI-6-07-6091-5		222	4995	<del>Cell Floor</del> /East Berm West Berm / North Berm
S41	HSI-6-07-6077-5		178	4005	<del>Cell Floor</del> /East Berm West Berm / North Berm
S42	HSI-6-07-6077-5		328	7380	<del>Cell Floor</del> /East Berm West Berm / North Berm
S43	HSI-6-07-6090-5		77	1733	<del>Cell Floor</del> /East Berm West Berm / North Berm
S44	HSI-6-07-6090-5		395	8888	<del>Cell Floor</del> /East Berm West Berm / North Berm
S45	HSI-6-07-6090-5		32	720	<del>Cell Floor</del> /East Berm West Berm / North Berm
S46	HSI-6-07-6079-5		372	8370	<del>Cell Floor</del> /East Berm West Berm / North Berm
S47	HSI-6-07-6079-5		134	3015	<del>Cell Floor</del> /East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

56837 SQ FT: Total Panel Area This Page

203502 SQ FT: Previous Total Panel Area

260339 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-12-08

SHEET 1; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S48	HS1-6-07-6080-5		271	6098	<u>Cell Floor</u> /East Berm West Berm / North Berm
S49	HS1-6-07-6080-5		233	5243	<u>Cell Floor</u> /East Berm West Berm / North Berm
S50	HS1-6-07-6103-5		175	3938	<u>Cell Floor</u> /East Berm West Berm / North Berm
S51	HS1-6-07-6103-5		325	7313	<u>Cell Floor</u> /East Berm West Berm / North Berm
S52	HS1-6-07-6102-5		86	1935	<u>Cell Floor</u> /East Berm West Berm / North Berm
S53	HS1-6-07-6086-5		417	9383	<u>Cell Floor</u> /East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

33910 SQ FT: Total Panel Area This Page

260339 SQ FT: Previous Total Panel Area

294249 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-13-08

SHEET 1; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
554	H51-6-07-6088-5		244	5490	Cell Floor/East Berm West Berm / North Berm
555	H51-6-07-6088-5		93	2093	Cell Floor/East Berm West Berm / North Berm
556	H51-6-07-6088-5		55	1238	Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

8821 SQ FT: Total Panel Area This Page

299249 SQ FT: Previous Total Panel Area

303070 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-14-08

SHEET 1; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S57	HS1-6-07-6109-5		104	2340	<u>Cell Floor</u> /East Berm West Berm / North Berm
S58	HS1-6-07-6109-5		77	1733	<u>Cell Floor</u> /East Berm West Berm / North Berm
S59	HS1-6-07-6088-5		63	1418	<u>Cell Floor</u> /East Berm West Berm / North Berm
S60	HS1-6-07-6109-5		44	990	<u>Cell Floor</u> /East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

6481 SQ FT: Total Panel Area This Page

303090 SQ FT: Previous Total Panel Area

309551 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles \_\_\_\_\_  
 Allen Smith \_\_\_\_\_  
 Stanley Howard \_\_\_\_\_

DATE: 3-19-08

SHEET 1; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S-61	HS2-6-07-6076-5		399	6978	Cell Floor/East Berm West Berm / North Berm
S-62	HS2-6-07-6076-5		93	2093	Cell Floor/East Berm West Berm / North Berm
S-63	HS2-6-07-6083-5		303	6918	Cell Floor/East Berm West Berm / North Berm
S-64	HS2-6-07-6083-5		187	4208	Cell Floor/East Berm West Berm / North Berm
S-65	HS2-6-07-6101-5		203	4568	Cell Floor/East Berm West Berm / North Berm
S-66	HS2-6-07-6101-5		291	6548	Cell Floor/East Berm West Berm / North Berm
S-67	HS2-6-07-6094-5		94	2115	Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

35,328 SQ FT: Total Panel Area This Page

309,551 SQ FT: Previous Total Panel Area

344,879 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-21-08

SHEET 1; PAGE 1 OF 4

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S-68	HS2-6-07-6094-5		382	8595	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-69	HS2-6-07-6093-5		378	8505	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-70	HS2-6-07-6093-5		115	2588	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-71	HS2-6-07-6097-5		256	5760	<u>Cell Floor</u> /East Berm West Berm / North Berm
S-72	HS2-6-07-6097-5		238	5355	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-73	HS2-6-07-6104-5		129	2903	<u>Cell Floor</u> /East Berm West Berm / North Berm
S-74	HS2-6-07-6104-5		359	8078	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-75	HS2-6-07-6099-5		357	8033	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-76	HS2-6-07-6099-5		132	2970	<u>Cell Floor</u> /East Berm West Berm / North Berm
S-77	HS2-6-07-6089-5		219	4928	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-78	HS2-6-07-6089-5		273	6143	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>

\* See As-Built Drawings for any deviations of panel length and placement.

63,858 SQ FT: Total Panel Area This Page  
344,879 SQ FT: Previous Total Panel Area  
408,737 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith  
Stanley Amul

DATE: 3-21-08

SHEET 1; PAGE 2 OF 4

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S-79	1452-6-07-6096-5		76	1755	Cell Floor/East Berm West Berm / North Berm
S-80	1452-6-07-6096-5		335	7538	Cell Floor/East Berm West Berm / North Berm
S-81	1452-6-07-6096-5		76	1710	Cell Floor/East Berm West Berm / North Berm
S-82	1452-6-07-6098-5		256	5760	Cell Floor/East Berm West Berm / North Berm
S-83	1452-6-07-6098-5		232	5220	Cell Floor/East Berm West Berm / North Berm
S-84	1452-6-07-6108-5		94	2115	Cell Floor/East Berm West Berm / North Berm
S-85	1452-6-07-6108-5		331	7448	Cell Floor/East Berm West Berm / North Berm
S-86	1452-6-07-6108-5		72	1620	Cell Floor/East Berm West Berm / North Berm
S-87	1452-6-07-6082-5		244	5490	Cell Floor/East Berm West Berm / North Berm
S-88	1452-6-07-6082-5		233	5243	Cell Floor/East Berm West Berm / North Berm
S-89	1452-6-07-6085-5		77	1733	Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

45,632 SQ FT: Total Panel Area This Page

408,737 SQ FT: Previous Total Panel Area

454,369 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
 \_\_\_\_\_  
 Allen Smith  
 \_\_\_\_\_  
 Stanley Raul  
 \_\_\_\_\_

DATE: 3-21-08

SHEET 1; PAGE 3 OF 4

GEOMEMBRANE DESCRIPTION:  
 Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1 PANEL IDENTIFICATION / PLACEMENT					
PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S-90	1452-6-07-6085-5		303	6818	<u>Cell Floor</u> /East Berm West Berm / <u>North Berm</u>
S-91	1452-6-07-6109-5		163	3668	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-92	1452-6-07-6081-5		114	2565	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-93	1452-6-07-6109-5		73	1643	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-94	1452-6-07-6109-5		28	630	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-95	1452-6-07-6082-5		10	225	Cell Floor/East Berm <u>West Berm</u> / North Berm
S-96	1452-6-07-6081-5		170	3825	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-97	1452-6-07-6081-5		159	3578	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-98	1452-6-07-6078-5		140	3150	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-99	1452-6-07-6078-5		123	2768	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm
S-100	1452-6-07-6078-5		107	2408	<u>Cell Floor</u> /East Berm <u>West Berm</u> / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

31,278 SQ FT: Total Panel Area This Page

454,369 SQ FT: Previous Total Panel Area

485,647 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith  
Stanley Rowl

DATE: 3-21-08

SHEET 1; PAGE 4 OF 4

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TABLE 1

PANEL IDENTIFICATION / PLACEMENT

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
S-101	HS2-6-07-6085-5		92	2070	Cell Floor/East Berm West Berm / North Berm
S-102	HS2-6-07-6078-5		73	1643	Cell Floor/East Berm West Berm / North Berm
S-103	HS2-6-07-6109-5		14x20	280	Cell Floor/East Berm West Berm / North Berm
S-104	HS2-6-07-6078-5		9x8	72	Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

4,065 SQ FT: Total Panel Area This Page  
485,647 SQ FT: Previous Total Panel Area  
489,712 SQ FT: Cumulative Panel Area

# PANEL IDENTIFICATION AND PLACEMENT

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith  
 \_\_\_\_\_  
 \_\_\_\_\_

DATE: 3-14-08 / 3-21-08

SHEET 1; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

*Geosynthetic Clay Liner*

**TABLE 1**  
**PANEL IDENTIFICATION / PLACEMENT**

PANEL NUMBER	ROLL NUMBER	COMMENTS or DAMAGE	LENGTH (FT)	AREA (FT <sup>2</sup> )	PANEL PLACEMENT LOCATION* (CIRCLE ALL THAT APPLY)
-	00001264	Sump 12B	-	2250	Cell Floor/East Berm West Berm / North Berm
-	00001262	Sump 12A	-	2250	Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm
					Cell Floor/East Berm West Berm / North Berm

\* See As-Built Drawings for any deviations of panel length and placement.

2250 SQ FT: Total Panel Area This Page

\_\_\_\_\_ SQ FT: Previous Total Panel Area

4500 SQ FT: Cumulative Panel Area

**TABLE NO. 2**  
**FIELD TRIAL SEAMS**

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 2; PAGE 1 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS				STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
1	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	SJB	W19	8:20	850	-	5.5	153/173	220	PASS
	TEXT/SMTH									147/157	217	
	SMTH/SMTH									165/163	226	
-	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	140/163	222	X
	TEXT/SMTH									172/156	221	
	SMTH/SMTH									-	-	
2	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	AK	D10	8:30	850	-	6.0	174/156	-	FAIL
	TEXT/SMTH									177/185	-	
	SMTH/SMTH									165/169	-	
-	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	147/166	-	X
	TEXT/SMTH									161/151	NFTB	
	SMTH/SMTH									-	-	
3	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	AK	D10	9:19	850	-	5.5	151/128	205	PASS
	TEXT/SMTH									124/146	218	
	SMTH/SMTH									137/135	202	
-	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	135/135	193	X
	TEXT/SMTH									147/159	199	
	SMTH/SMTH									-	-	

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-10-08  
 SHEET 2; PAGE 2 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
4	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	W4	1:47	800	-	6.5	127/145 148/144 125/156	196 176 207	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	130/121 136/128	199 211	X
5	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	1:55	850	-	6.0	122/130 122/130 126/133	181 154 179	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	132/136 120/140	176 180	X
6	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	1:14	850	-	6.0	150/157 138/154 148/117	182 182 172	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	148/149 157/139	174 188	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 2; PAGE 3 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)			RESULTS (2) (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
7	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	W4	1:50	800	-	6.5	118/145 112/136 139/148	176 174 174	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	147/129 142/142 -/-	183 169 -	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
RUSSELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-11-08  
SHEET 2; PAGE 1 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	8:05	850	-	5.5	164/179 161/161 150/148	209 200 218	PASS F7B
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	157/150 166/163	216 210	X
2	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SB	W19	8:10	850	-	5.5	166/145 <del>168/145</del>	NFTB	FAIL
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	-	-	X
3	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	W4	8:25	800	-	6.5	163/143 117/152 144/128	223 228 212	PASS F7B
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	167/150 154/141	230 202	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 407-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-11-98  
 SHEET 2; PAGE 2 OF 3

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (0) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
4	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SB	W19	8:32	850	-	5.0	158/150 157/150 133/163	204 203 190	PASS
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	135/141 167/157	208 207	X
5	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SB	W19	12:18	850	-	5.0	124/156 137/154 136/160	173 191 192	X
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	128/144 147/137	185 180	X
6	TEXT/TEXT TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	W4	12:17	800	-	6.5	139/123 131/127 137/138	179 179 195	X
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	128/129 141/137	182 183	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-11-08  
 SHEET 2; PAGE 3 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
7	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	1:05	850	-	5.5	129/133 149/139 142/150	189 192 182	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	143/139 148/147	181 180	X
8	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	EX	G29	12:50	250	350	-	156/- 126/- 129/-	160 154 172	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	123/- 122/-	144 153	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 2; PAGE 1 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS				STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
1	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	7:55	850	-	5.0	168/170 144/150 152/155	235 229 230	PASS FAIL
-	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	157/154 144/146 -	215 224 -	FAIL
2	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	7:50	850	-	5.0	143/175 139/178 (165)	- NFTB	FAIL
-	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	-	-	FAIL
3	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	8:20	850	-	4.5	161/159 167/157 175/149	217 214 224	PASS FAIL
-	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	168/159 160/155 -	222 217 -	FAIL

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMITH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 2; PAGE 2 OF 4

MINIMUM PEEL & SHEAR VALUES:  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 2  
FIELD TRIAL SEAMS

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
4	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	D13	8:40	800	-	3.8	167/160 157/180 153/136	FAIL
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	157/153 171/168	FAIL
5	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	D13	9:50	800	-	4.0	162/168 133/140 144/135	PASS FAIL
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	136/160 167/171	FAIL
6	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	D13	1:30	800	-	4.0	167/167 113/157 162/166	PASS FAIL
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	127/136 129/150	FAIL

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 2; PAGE 3 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
7	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	1:37	850	-	5.0	131/145 145/145 135/136	185 163 167	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	134/135 143/159	174 184	X
8	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	1:30	850	-	4.5	141/148 171/139 154/142	182 190 205	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	158/137 134/140	192 193	X
9	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	D13	4:17	800	-	5.5	169/154 146/147 156/160	199 184 191	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	151/152 144/153	185 188	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-12-08  
 SHEET 2; PAGE 4 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS				STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
10	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	SN	W4	5:10	800	-	6.5	111 / 136	189	PASS
-	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	137 / 131	185	F715
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							121 / 138	181	
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							126 / 151	187	
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							120 / 144	192	
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							-	-	
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							-	-	
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							-	-	
	TEXT/TEXT TEXT/SMITH SMITH/SMITH		DBL FUSION SNG FUSION EXTRUSION							-	-	

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMITH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 2; PAGE 1 OF 4

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 75 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 2  
FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS				STRENGTH AT BREAK (PEE)		RESULTS (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
1	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	7:50	850	-	4.5	173 / 170	NFTB	FAIL
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	-	-	X
2	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SA	D13	8:12	800	-	5.0	141/139 135/165 170/168	231 222 159	PASS FAIL
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	129/168 134/133	230 200	X
3	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	8:10	850	-	5.0	140	NFTB	FAIL
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	-	-	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. JRF-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 2; PAGE 2 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 2  
FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
4	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	8:23	850	-	4.5	171/169 171/164 150/156	252 255 210	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	150/161 178/138	200 200	X
5	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	9:15	850	-	5.0	149/140 132/139 132/130	242 237 238	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	135/160 130/145	244 256	X
6	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	1:24	800	-	4.0	125/135 124/114 116/135	201 201 199	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	117/131 135/126	196 199	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel scanned. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERITIE COUNTY, NORTH CAROLINA  
 RUSSELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-13-08  
 SHEET 2; PAGE 3 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
7	TEXT/TEXT TEXT/SMITH <del>SMITH/SMITH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SB	W19	1:20	850	-	4.5	142/125 160/104 143/117	163 151 145 PASS FTB
-	TEXT/TEXT TEXT/SMITH <del>SMITH/SMITH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	137/117 135/111 +	167 147 - X
8	TEXT/TEXT <del>TEXT/SMITH</del> SMITH/SMITH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	D13	1:25	800	-	3.0	126/127 122/136 133/162	166 158 155 PASS FTB
-	TEXT/TEXT <del>TEXT/SMITH</del> SMITH/SMITH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	132/147 119/136 +	167 166 - X
9	<del>TEXT/TEXT</del> TEXT/SMITH SMITH/SMITH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	2:08	800	-	3.0	127/139 143/138 135/138	160 157 159 PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMITH SMITH/SMITH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	149/137 138/142 +	158 155 - X

Notes: (1) Textured geomembrane has a smooth, approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMITH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 2; PAGE 4 OF 4

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 2  
FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
10	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	2:15	800	-	3.5	100/126 94/101 108/101	145 147 149	PASS FTB
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	107/110 125/111	152 158	X
11	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	D13	2:15	800	-	5.0	123/135 132/134 137/130	163 163 158	PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	122/141 123/140	158 153	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							1		
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							1		

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LANNONS ENGINEERING, INC. PROJECT NO. 007-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 2; PAGE 1 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	D13	7:55	800	-	5.0	146/148 136/147 144/135	213 226 208	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	147/153 146/135	224 222	X
2	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	W19	7:52	850	-	4.5	139/141 141/179 129/153	233 226 223	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	149/129 142/138	242 221	X
3	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	8:06	800	-	4.0	145/160 141/164 145/159	243 250 246	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	138/132 142/166	256 236	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

# FIELD TRIAL SEAMS

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 807-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 2; PAGE 2 OF 4

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)		
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST	
4	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	AK	D10	9:25	800	-	4.0	161/160	259	PASS	
	TEXT/SMTH									152/152	201		
	SMTH/SMTH									159/157	213		FTB
5	TEXT/TEXT	AGRU AMERICA ROLL	DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	156/141	211	FTB	
	TEXT/SMTH									128/158	210		
	SMTH/SMTH									-	-		
6	TEXT/TEXT	AGRU AMERICA ROLL	DBL FUSION SNG FUSION EXTRUSION	SB	W19	10:30	850	-	4.5	158/132	236	PASS	
	TEXT/SMTH									157/163	233		
	SMTH/SMTH									182/168	230		FTB
6	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	156/144	239	FTB	
	TEXT/SMTH									153/150	220		
	SMTH/SMTH									-	-		
6	TEXT/TEXT	AGRU AMERICA ROLL	DBL FUSION SNG FUSION EXTRUSION	SN	D13	10:30	800	-	4.0	122/149	217	PASS	
	TEXT/SMTH									104/150	209		
	SMTH/SMTH									125/146	208		FTB
6	TEXT/TEXT		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	117/150	210	FTB	
	TEXT/SMTH									130/121	211		
	SMTH/SMTH									-	-		

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-0001-58

DATE: 3-14-08  
SHEET 2; PAGE 3 OF 4

COA TECHNICIANS:  
Ted Stiles  
Allen Smith

MINIMUM PEEL & SHEAR VALUES:  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 2  
FIELD TRIAL SEAMS

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
7	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	EK	G29	1035	250	350	-	105 / - 104 / - 125 / -	176 181 177 PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	118 / - 124 / - -	194 211 - X
8	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	1:23	850	-	3.5	112 / 113 117 / 120 117 / 113	166 161 159 PASS FTB
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	132 / 127 120 / 113 -	166 168 - X
9	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	TS	D19	1:20	800	-	4.5	115 / 157 138 / 121 136 / 132	187 195 190 PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	146 / 138 139 / 129 -	193 191 - X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

# FIELD TRIAL SEAMS

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 2; PAGE 4 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
10	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	G29	1:30	250	350	—	107 / — 115 / — 111 / —	177 178 180	PASS PASS FTB
—	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	—	—	—	—	—	—	130 / — 107 / — — / —	195 181 —	X X X
11	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	D13	1:30	800	—	3.5	135 / 147 155 / 147 163 / 152	187 170 164	PASS PASS FTB
—	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	—	—	—	—	—	—	157 / 161 151 / 146 — / —	170 174 —	X X X
12	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	D13	1:30	800	—	4.0	130 / 151 114 / 137 114 / 134	190 201 198	PASS PASS FTB
—	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	—	—	—	—	—	—	123 / 141 151 / 131 — / —	203 188 —	X X X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

# FIELD TRIAL SEAMS

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-15-08  
SHEET 2; PAGE 1 OF 3

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 2  
FIELD TRIAL SEAMS

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SN	G29	9:09	250	350	-	131- 143- 132-	208 209 199	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	141- 128-	195 204	X
2	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	PI	G8	9:30	250	350	-	129- 127- 115-	230 251 231	PASS PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	103- 101-	245 232	X
3	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	SN	D10	9:35	800	-	4.5	137/117 129/122 144/123	179 218 218	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	140/124 131/127	190 189	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-15-08  
 SHEET 2; PAGE 2 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
4	<del>TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SB	G34	10:30	500	400	-	1051 - 197 1331 - 200 1251 - 195	PASS FTB
-	<del>TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	1391 - 190 1241 - 189 -	X
5	<del>TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	ST	G34	10:40	500	400	-	1251 - 182 1141 - 193 1371 - 164	PASS FTB
-	<del>TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	1261 - 179 1071 - 183 -	X
6	<del>TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	P1	G8	1:40	250	350	-	1151 - 192 1251 - 187 1361 - 193	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	1311 - 183 1321 - 189 -	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 407-4001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-15-08  
SHEET 2; PAGE 3 OF 3

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 2  
FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
7	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	G29	1:42	250	350	—	142/- 134/- 123/-	190 179 190	PASS FTB
—	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	—	—	—	—	—	—	127/- 127/- —	190 190 —	X
8	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	D10	1:50	800	—	5.9	113/123 100/149 115/121	157 224 155	PASS FTB
—	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	—	—	—	—	—	—	137/140 136/141 —	151 156 —	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	

Note: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith

DATE: 3-17-98  
 SHEET 2; PAGE 1 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(1)</sup> (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
1	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	P1	G8	8:00	250	350	-	1011 - 211 1361 - 227 1241 - 224	PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	1271 - 222 1591 - 225	X
2	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SB	G29	8:00	250	350	-	1460 - 283 1481 - 259 1601 - 179	PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	1621 - 277 1551 - 296	X
3	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	9:00	850	-	3.5	165155 233 152154 225 168142 230	PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	146140 290 151165 220	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-17-08  
 SHEET 2; PAGE 2 OF 3

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (psi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
4	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	1:10	850	-	3.5	159/171 169/188 162/187	189 184 189	PASS PASS F1B
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	156/175 155/149	200 170	X
5	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	PI	G-8	1:18	250	350	-	140/160 152/168 149/162	160 208 202	PASS PASS F1B
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	157/160 112/110	217 219	X
6	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SB	G29	1:20	250	350	-	127/120 130/125 148/120	252 224 220	PASS PASS F1B
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	148/140 147/140	217 219	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 407-4001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-17-08  
 SHEET 2; PAGE 3 OF 3

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)			RESULTS <sup>(2)</sup> (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
7	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	2:54	850	-	3.5	124/153	190	Pass
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	163/152	191	Fail
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-18-08  
 SHEET 2; PAGE 1 OF 1

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(1)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SB	G29	8:12	250	350	-	144 / - 135 / - 187 / -	222 226 255 PASS PASS	
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	160 / - 177 / - 4 / -	236 243 -	X
2	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SB	G29	1:30	250	350	-	143 / - 127 / - 139 / -	187 196 197 PASS PASS	
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	141 / - 138 / - 4 / -	193 194 -	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1004-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-19-08  
 SHEET 2; PAGE 1 OF 2

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	SB	G29	8:15	250	350	-	110 / - 130 / - 141 / -	214 223 221	PASS F7B
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	121 / - 135 / -	217 222	X
2	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	SN	D13	8:45	800	-	4.5	148 / 144 145 / 157 154 / 145	229 231 231	PASS F7B
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	155 / 162 146 / 153	229 227	X
3	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D10	8:50	850	-	4.5	121 / 130 150 / 132 130 / 130	222 226 220	PASS F7B
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	154 / 142 149 / 124	230 225	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTRIE COUNTY, NORTH CAROLINA  
 RUSSELL-JAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-19-08  
 SHEET 2; PAGE 2 OF 2

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
4	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	4:00	850	-	4.5	144 / 137 139 / 151 136 / 139	212 217 212	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	149 / 150 141 / 149	208 206	X
5	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SB	G29	3:45	250	350	-	127 / - 112 / - 127 / -	165 189 180	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	119 / - 131 / -	190 186	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH checked to correspond with the type of geomembrane panel scanned. Textured "butt seams" should be noted in the "COMMENTS" column.

(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 2; PAGE 1 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (psi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D19	7:50	800	-	5.0	136/143 140/150 147/144	218 225 215	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	134/149 157/165	222 222	X
2	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AP	G29	8:00	250	350	-	151/- 87/- 140/-	230 237 227	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	139/- 133/-	231 227	X
3	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	NJ	D19	8:00	800	-	4.5	168/167 141/166 173/152	232 209 223	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	154/152 155/171	233 227	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 RUSSELL-CAMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-21-08  
 SHEET 2; PAGE 2 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)			RESULTS (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
4	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	SN	D13	8:00	800	-	4.5	146/162 145/156 168/168	291 229 226	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	143/173 176/137	229 221	X
5	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	1:40	800	-	5.0	114/136 110/139 103/130	162 166 157	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	114/135 129/126	136 156	X
6	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	NJ	D19	1:45	800	-	4.5	136/137 131/133 144/120	183 188 189	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	152/124 152/131	185 170	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH checked to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-21-08  
 SHEET 2; PAGE 3 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (C) (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
7	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	AP	G29	1:50	250	350	-	1351 - 165 1321 - 165 1301 - 144	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	1391 - 149 1311 - 163 - - -	X X X
8	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	SN	D13	1:45	800	-	4.5	1421/24 - - 1331/41 - - 1321/30 - -	FAIL FAIL FAIL
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	1341/26 - - 1401/39 N/FTB - - -	X X X
9	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	SN	D13	2:10	850	-	4.5	1431/53 174 1291/51 210 1331/53 177	PASS PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	1331/58 169 1341/61 179 - - -	X X X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 RUSSELL-AMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

**CQA TECHNICIANS:**  
 Ted Stiles  
 Allen Smith

DATE: 3-21-08  
 SHEET 2; PAGE 4 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
10	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	6:28	800	-	5.0	142/151 145/157 134/129	212 202 205	Pass Pass FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	141/141 143/137	219 198	X
11	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AK	D10	6:30	800	-	4.5	156/175 158/161 166/163	215 196 198	Pass Pass FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	161/168 151/153	213 205	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 3074-001-58

**COA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-22-08  
 SHEET 2; PAGE 1 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

**TABLE 2  
 FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION <del>EXTRUSION</del>	AP	G29	8:00	250	350	-	158 / - 153 / - 125 / -	202 199 203	Pass Pass FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	143 / - 164 / - -	203 199 -	X X X
2	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	NJ	D10	8:50	800	-	35	156 / 163 125 / 152 126 / 153	229 230 226	Pass Pass FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	130 / 150 137 / 137 -	218 223 -	X X X
3	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	SN	D13	8:25	800	-	4.5	150 / 133 145 / 131 135 / 135	246 194 241	Pass Pass FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	146 / 161 154 / 140 -	245 246 -	X X X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-22-08  
SHEET 2; PAGE 2 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 2  
FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (2) (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
4	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D19	9:00	800	-	4.0	135/1153 141/149 133/154	209 211 210	PASS FTB
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	143/168 135/142	208 220	X
5	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D19	8:55	800	-	4.5	150/130 128/132 124/148	123 124 124	PASS FTB
-	TEXT/TEXT TEXT/SMTH <del>SMTH/SMTH</del>		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	135/145 131/130	122 127	X
6	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D19	8:45	800	-	4.0	157/160 135/159 167/156	213 212 209	PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	168/157 169/126	221 211	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERKIE COUNTY, NORTH CAROLINA  
 BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-22-58  
 SHEET 2; PAGE 3 OF 4

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(2)</sup> (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
7	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D19	1:22	800	-	4.0	141/133 137/135 152/155	169 163 169	PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	133/138 149/139	157 159	X
8	<del>TEXT/TEXT</del> <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AK	D19	1:22	800	-	4.0	119/129 118/125 123/117	169 169 160	PASS FTB
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	-	-	-	-	-	-	129/114 124/107	169 179	X
9	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		<del>DBL FUSION</del> SNG FUSION EXTRUSION	AP	G29	1:00	250	350	-	140/- 141/- 152/-	168 169 174	PASS FTB
-	<del>TEXT/TEXT</del> TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	134/- 143/-	171 170	X

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 3-22-88  
SHEET 2; PAGE 4 OF 4

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 2  
FIELD TRIAL SEAMS**

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (psi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
10	TEXT/TEXT TEXT/SMTH SMTH/SMTH	AGRY / POLY FLEX	DBL FUSION SNG FUSION EXTRUSION	N1	D10	2:10	850	-	3.5	133 113 111 122 125 1140	179 170 167	PASS FTB
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	122 1137 114 123	181 180	X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION									
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION									
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION									
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION									

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-AMMONS ENGINEERING, INC. PROJECT NO. 07-1004-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-23-08  
 SHEET 2; PAGE 1 OF 1

**MINIMUM PEEL & SHEAR VALUES:**

Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS <sup>(1)</sup> (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	
1	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	AP	G29	800	250	350	-	141 / - 1361 / - 1281 / -	219 225 225 PASS FAIL
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	1361 / - 1311 / - - / -	225 214 - X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/ / /	/ / /
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/ / /	/ / /
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/ / /	/ / /
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/ / /	/ / /

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seams should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

**FIELD TRIAL SEAMS**

EAST CAROLINA REGIONAL MSW LANDFILL  
 CONSTRUCTION OF CELL NO. 12  
 BERTIE COUNTY, NORTH CAROLINA  
 BUNNELL-AMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

**CQA TECHNICIANS:**

Ted Stiles  
 Allen Smith

DATE: 3-24-08  
 SHEET 2; PAGE 1 OF 1

**MINIMUM PEEL & SHEAR VALUES:**  
 Fusion Weld - 91 ppi & 120 ppi  
 Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
 Material: HDPE Textured & Textured  
 Thickness: 60 mil  
 Manufacturer: PolyFlex

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (1) (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)			RESULTS (2) (PASS/FAIL)
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST	SHEAR TEST	
1	TEXT/TEXT TEXT/SMTH SMTH/SMTH	RAIN FLAP	DBL FUSION SNG FUSION EXTRUSION	SB	G29	9:30	250	350	-	114	172	PASS
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	119	190	X
2	TEXT/TEXT TEXT/SMTH SMTH/SMTH	RAIN FLAP	DBL FUSION SNG FUSION EXTRUSION	PI	G8	11:00	250	350	-	98	178	PASS
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	103	180	F7B
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	98	188	X
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	101	195	X
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	96	169	X
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	-	-	-
-	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION	-	-	-	-	-	-	-	-	-

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
 (2) Include Description of Break

# FIELD TRIAL SEAMS

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J97-1001-58

**COA TECHNICIANS:**

Ted Stiles  
Allen Smith

DATE: 4-19-08  
SHEET 2; PAGE 1 OF 1

**MINIMUM PEEL & SHEAR VALUES:**  
Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

**GEOMEMBRANE DESCRIPTION:**  
Material: HDPE Textured & Textured  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 2  
FIELD TRIAL SEAMS

TRIAL SEAM NO.	TRIAL SEAM MATERIAL (Circle One)	COMMENTS	SEAMING METHOD (Circle One)	WELDER NAME	MACHINE NUMBER	MACHINE PARAMETERS			STRENGTH AT BREAK (ppi)		RESULTS (PASS/FAIL)	
						TIME	PREHEAT TEMP	BARREL TEMP	SPEED	PEEL TEST		SHEAR TEST
1	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH	RAIN FLAP REPAIR	DBL FUSION SNG FUSION <del>EXTRUSION</del>	MA	G-8	10:40	250	200	-	148 139 147	166 171 159	PASS PASS FTB
-	TEXT/TEXT <del>TEXT/SMTH</del> SMTH/SMTH		DBL FUSION SNG FUSION <del>EXTRUSION</del>	-	-	-	-	-	-	144 148	173 174	X X
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/
	TEXT/TEXT TEXT/SMTH SMTH/SMTH		DBL FUSION SNG FUSION EXTRUSION							/	/	/

Notes: (1) Textured geomembrane has a smooth approximately 6-inch wide welding strip. Although the actual weld is on the smooth portion of the geomembrane sheet, the test seam should have either TEXT/TEXT or TEXT/SMTH circled to correspond with the type of geomembrane panel seamed. Textured "butt seams" should be noted in the "COMMENTS" column.  
(2) Include Description of Break

**TABLES NO. 3 & 4**  
**FIELD SEAMING &**  
**NONDESTRUCTIVE SEAM TESTING**

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08

SHEET 3; PAGE 1 OF 7

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
S-2 / S-3	23	<u>DOUBLE FUSION</u>	W19	SB	5.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	10:10	10:15	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
S-1 / S-2	147	<u>DOUBLE FUSION</u>	D10	AK	5.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	12:54	12:59	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
S-1 / S-3	193	<u>DOUBLE FUSION</u>	D10	AK	5.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	10:54	10:59	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
S-3 / S-5	112	<u>DOUBLE FUSION</u>	D10	AK	5.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	11:55	12:00	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
S-3 / S-4	82	<u>DOUBLE FUSION</u>	D10	AK	5.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	11:55	12:00	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	

557 ft.: Total Seam Length this page.  
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557 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 3; PAGE 2 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
5-2 / 5-4	150	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	1155	1200	30	30	<del>PASS</del> / FAIL
5-4 / 5-5	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	1105	1110	30	30	<del>PASS</del> / FAIL
5-5 / 5-6	113	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	1200	1205	30	30	<del>PASS</del> / FAIL
5-4 / 5-6	236	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	1200	1205	30	30	<del>PASS</del> / FAIL
5-6 / 5-7	353	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	6.0	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	2300	2411	30	30	<del>PASS</del> / FAIL

875 ft.: Total Seam Length this page.  
557 ft.: Previous Total Seam Length.  
1432 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 3; PAGE 3 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING						RESULT (circle one)			
										TIME		PRESSURE (psi)		CHANGE	END		START	END	CHANGE
										START	END	START	END						
S-8/S-9	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - ESS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	153	158	30	28	2	(PASS) FAIL				
S-7/S-9	229	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - ESS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	350	355	30	30	0	(PASS) FAIL				
S-7/S-8	128	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - ESS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	412	417	30	30	-	(PASS) FAIL				
S-10/S-11	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	6.0	850	0 - ESS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	243	248	30	28	2	(PASS) FAIL				
S-9/S-11	97	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	850	0 - ESS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	425	430	30	30	-	(PASS) FAIL				

500 ft.: Total Seam Length this page.  
1432 ft.: Previous Total Seam Length.  
1932 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08

SHEET 3; PAGE 4 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
S-9/S-10	131	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	800	0 - EAS	(TS)AS	AIR CHANNEL OR VACUUM BOX	4/25	4/30	30	30	-	PASS / FAIL
S-8/S-10	133	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	800	0 - EAS	(TS)AS	AIR CHANNEL OR VACUUM BOX	4/25	4/30	30	30	-	PASS / FAIL
S-11/S-12	99	<del>DOUBLE FUSION</del> SINGLE FUSION	D10	AK	6.0	850	0 - EAS	(TS)AS	AIR CHANNEL OR VACUUM BOX	6/14	6/19	30	29	1	PASS / FAIL
S-10/S-12	267	<del>DOUBLE FUSION</del> SINGLE FUSION	D10	AK	6.0	850	0 - EAS	(TS)AS	AIR CHANNEL OR VACUUM BOX	6/14	6/19	30	29	1	PASS / FAIL
S-12/S-13	369	<del>DOUBLE FUSION</del> SINGLE FUSION	W19	SB	6.0	850	0 - EAS	(TS)AS	AIR CHANNEL OR VACUUM BOX	6/18	6/23	30	30	-	PASS / FAIL

999 ft.: Total Seam Length this page.  
1932 ft.: Previous Total Seam Length.  
2931 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 3; PAGE 5 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING					RESULT (circle one)
										TIME		PRESSURE (psi)		CHANGE	
										START	END	START	END		
5-13 / 5-15	255	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	850	0 - EDS	TSMAS	<del>AIR CHANNEL</del> OR VACUUM BOX	628	633	30	28	2	<del>PASS</del> FAIL
5-13 / 5-14	119	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - EDS	TSMAS	<del>AIR CHANNEL</del> OR VACUUM BOX	628	633	30	28	2	<del>PASS</del> FAIL
5-14 / 5-15	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	6.0	850	0 - EDS	TSMAS	<del>AIR CHANNEL</del> OR VACUUM BOX	405	410	30	29	1	<del>PASS</del> FAIL
5-15 / 5-17	150	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - EDS	TSMAS	<del>AIR CHANNEL</del> OR VACUUM BOX	625	630	30	30	-	<del>PASS</del> FAIL
5-15 / 5-16	106	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - EDS	TSMAS	<del>AIR CHANNEL</del> OR VACUUM BOX	625	630	30	30	-	<del>PASS</del> FAIL

653 ft.: Total Seam Length this page.  
2931 ft.: Previous Total Seam Length.  
3584 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 3; PAGE 6 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
5-14/S-16	124	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	6:25	6:30	30	30	-	<u>PASS</u> /FAIL
5-16/S-17	23	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	6.0	850	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	8:24	8:29	30	29	1	<u>PASS</u> /FAIL
5-17/S-19	40	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W4	SH	6.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	6:30	6:35	30	27	3	<u>PASS</u> /FAIL
5-17/S-18	111	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W4	SH	6.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	6:30	6:35	30	27	3	<u>PASS</u> /FAIL
5-16/S-18	234	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W4	SH	6.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	6:30	6:35	30	27	3	<u>PASS</u> /FAIL

532 ft.: Total Seam Length this page.  
3584 ft.: Previous Total Seam Length.  
4116 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-10-08  
SHEET 3; PAGE 7 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
S-18/S-19	23	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	6.0	850	0 - EDS	(T)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	815	820	30	30	<u>PASS</u> /FAIL
S-19/S-20	38	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - EDS	(T)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	800	805	30	30	<u>PASS</u> /FAIL
S-18/S-20	348	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	6.0	800	0 - EDS	(T)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	800	805	30	30	<u>PASS</u> /FAIL
S-20/S-21	391	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	6.0	850	0 - EDS	(T)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	803	808	30	30	<u>PASS</u> /FAIL
S-21/S-22	396	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	6.0	850	0 - 381 381 - EDS	(T)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	915	920	30	30	<u>PASS</u> /FAIL
										907	912	30	30	<u>PASS</u> /FAIL

1196 ft.: Total Seam Length this page.  
4116 ft.: Previous Total Seam Length.  
5312 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-11-08  
SHEET 3; PAGE 1 OF 12

CQA TECHNICIANS: Ted Stiles  
Allen Smith

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T-1 / T-2	66	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	S - EWS	TS/AS	AIR CHANNEL OR VACUUM BOX	932	937	30	30	PASS / FAIL
T-2 / T-3	66	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SH	6.5	800	S - EWS	TS/AS	AIR CHANNEL OR VACUUM BOX	934	939	30	30	PASS / FAIL
T-3 / T-4	67	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	S - EWS	TS/AS	AIR CHANNEL OR VACUUM BOX	936	941	30	30	PASS / FAIL
T-4 / T-5	67	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	S - EWS	TS/AS	AIR CHANNEL OR VACUUM BOX	943	948	30	30	PASS / FAIL
T-5 / T-6	69	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	S - EWS	TS/AS	AIR CHANNEL OR VACUUM BOX	945	950	30	30	PASS / FAIL

335 ft.: Total Seam Length this page.  
5312 ft.: Previous Total Seam Length.  
5647 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08

SHEET 3; PAGE 2 OF 10

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T-6/T-7	70	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - EDS	TSMAS	AIR CHANNEL OR VACUUM BOX	1016	1021	30	30	-	PASS / FAIL
T-7/T-8	72	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - EDS	TSMAS	AIR CHANNEL OR VACUUM BOX	957	1002	30	30	-	PASS / FAIL
T-8/T-9	72	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - 3 3 - EDS	TSMAS	AIR CHANNEL OR VACUUM BOX	CAPPED		2-86			PASS / FAIL
T-9/T-10	73	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - EDS	TSMAS	AIR CHANNEL OR VACUUM BOX	1023	1028	30	29	1	PASS / FAIL
T-10/T-11	74	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - EDS	TSMAS	AIR CHANNEL OR VACUUM BOX	1029	1034	30	30	-	PASS / FAIL
										1032	1037	30	29	1	PASS / FAIL

361 ft.: Total Seam Length this page.  
5647 ft.: Previous Total Seam Length.  
6008 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08

SHEET 3; PAGE 3 OF 10

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
F-11 / F-12	76	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1047	1052	30	30	-	PASS / FAIL
F-12 / F-13	77	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1050	1055	30	30	-	PASS / FAIL
F-13 / F-14	78	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1052	1057	30	30	-	PASS / FAIL
S-22 / S-24	344	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	229	234	30	29	1	PASS / FAIL
S-22 / S-23	59	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	229	234	30	29	1	PASS / FAIL

634 ft.: Total Seam Length this page.  
6008 ft.: Previous Total Seam Length.  
6642 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08  
SHEET 3; PAGE 4 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING						RESULT (circle one)	
										TIME		PRESSURE (psi)		START	END		CHANGE
										START	END	START	END				
S-23/S-24	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - ESS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	102	107	30	30	-	<del>PASS</del> /FAIL		
S-24/S-26	294	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - ESS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	246	251	30	30	-	<del>PASS</del> /FAIL		
S-24/S-25	48	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - ESS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	250	255	30	28	2	<del>PASS</del> /FAIL		
S-23/S-25	60	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - ESS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	250	255	30	28	2	<del>PASS</del> /FAIL		
S-25/S-26	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - ESS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	148	153	30	30	-	<del>PASS</del> /FAIL		

448 ft.: Total Seam Length this page.  
6642 ft.: Previous Total Seam Length.  
7090 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08  
SHEET 3; PAGE 5 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
S-26/S-28	218	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	353	358	30	30	(PASS) FAIL
		EXTRUSION												
S-26/S-27	80	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	353	358	30	30	(PASS) FAIL
		EXTRUSION												
S-25/S-27	112	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	355	400	30	29	(PASS) FAIL
		EXTRUSION												
S-27/S-28	23	<del>DOUBLE FUSION</del> SINGLE FUSION	W19	SB	5.0	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	220	225	30	30	(PASS) FAIL
		EXTRUSION												
S-28/S-30	142	<del>DOUBLE FUSION</del> SINGLE FUSION	D10	AK	5.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	407	412	30	30	(PASS) FAIL
		EXTRUSION												

575 ft.: Total Seam Length this page.  
7090 ft.: Previous Total Seam Length.  
7665 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LANMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08

SHEET 3; PAGE 6 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING						RESULT (circle one)	
										TIME		PRESSURE (psi)		START	END		CHANGE
										START	END	START	END				
5-28 / 5-29	79	DOUBLE FUSION SINGLE FUSION EXTRUSION	D14	AK	5.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4/07	4/12	30	30	-	PASS/FAIL		
5-27 / 5-29	195	DOUBLE FUSION SINGLE FUSION EXTRUSION	P10	AK	5.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4/19	4/24	30	30	-	PASS/FAIL		
5-29 / 5-30	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	3/00	3/05	30	30	-	PASS/FAIL		
5-30 / 5-32	67	DOUBLE FUSION SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4/59	5/04	30	30	-	PASS/FAIL		
5-30 / 5-31	72	DOUBLE FUSION SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4/59	5/04	30	30	-	PASS/FAIL		

436 ft.: Total Seam Length this page.  
7665 ft.: Previous Total Seam Length.  
8101 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08

SHEET 3; PAGE 7 OF 10

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
S-29/S-31	277	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W44	SN	6.5	800	0 - E-35	<u>TS/MAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	4/59	504	30	30	<u>PASS</u> /FAIL
S-31/S-32	23	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - E-05	<u>TS/MAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	4/28	4/33	30	29	<u>PASS</u> /FAIL
S-32/S-33	65	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - E-05	<u>TS/MAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	5/10	5/5	30	30	<u>PASS</u> /FAIL
S-31/S-33	353	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	5.5	850	0 - E-05	<u>TS/MAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	5/10	5/5	30	30	<u>PASS</u> /FAIL
S-33/S-34	423	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	5.0	850	0 - E-05	<u>TS/MAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	6/50	7/01	30	30	<u>PASS</u> /FAIL

1141 ft.: Total Seam Length this page.  
8101 ft.: Previous Total Seam Length.  
9242 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-11-08  
SHEET 3; PAGE 8 OF 10

CQA TECHNICIANS: Ted Stiles  
Allen Smith

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
S-34 / S-36	366	<u>DOUBLE FUSION</u>	W4	SN	6.5	850	0 - 352	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	641	646	30	30	-	<u>PASS</u> / FAIL
		352 - E05					647			652	30	29	1	<u>PASS</u> / FAIL	
S-34 / S-35	63	<u>DOUBLE FUSION</u>	W4	SN	6.5	800	0 - E85	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	647	652	30	29	1	<u>PASS</u> / FAIL
		-					-			-	-	-	-	<u>PASS</u> / FAIL	
S-35 / S-36	23	<u>DOUBLE FUSION</u>	D10	AK	5.5	850	0 - E55	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	548	553	30	30	-	<u>PASS</u> / FAIL
		-					-			-	-	-	-	<u>PASS</u> / FAIL	
T-14 / T-15	79	<u>DOUBLE FUSION</u>	D10	AK	5.5	850	0 - E55	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	605	610	30	29	1	<u>PASS</u> / FAIL
		-					-			-	-	-	-	<u>PASS</u> / FAIL	
T-15 / T-16	81	<u>DOUBLE FUSION</u>	W19	SB	5.0	850	0 - E05	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	617	622	30	30	-	<u>PASS</u> / FAIL
		-					-			-	-	-	-	<u>PASS</u> / FAIL	

612 ft.: Total Seam Length this page.  
9242 ft.: Previous Total Seam Length.  
9854 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
PUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08  
SHEET 3; PAGE 9 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T-16/T-17	83	DOUBLE FUSION	D10	AK	5.5	850	0 - EDS	TSAS	AIR CHANNEL OR VACUUM BOX	623	628	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												
T-17/T-18	84	DOUBLE FUSION	W19	SB	5.0	850	0 - EDS	TSAS	AIR CHANNEL OR VACUUM BOX	656	701	30	28	PASS/FAIL
		SINGLE FUSION EXTRUSION												
T-18/T-19	84	DOUBLE FUSION	D10	AK	5.5	850	0 - 79 79 - EDS	TSAS	AIR CHANNEL OR VACUUM BOX	709	714	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION											703	708
T-19/T-20	87	DOUBLE FUSION	W19	SB	5.0	850	0 - EDS	TSAS	AIR CHANNEL OR VACUUM BOX	710	715	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												
T-20/T-21	87	DOUBLE FUSION	D10	AK	5.5	850	0 - EDS	TSAS	AIR CHANNEL OR VACUUM BOX	717	722	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												

425 ft.: Total Seam Length this page.  
9854 ft.: Previous Total Seam Length.  
10279 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-11-08

SHEET 3; PAGE 10 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
721 / 722	88	DOUBLE FUSION	W19	SB	5.0	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	720	725	30	30	PASS / FAIL	
		SINGLE FUSION EXTRUSION													PASS / FAIL
/		DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX						PASS / FAIL
/		SINGLE FUSION EXTRUSION													PASS / FAIL
/		DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX						PASS / FAIL
/		SINGLE FUSION EXTRUSION													PASS / FAIL
/		DOUBLE FUSION													PASS / FAIL
/		SINGLE FUSION EXTRUSION													PASS / FAIL
/		DOUBLE FUSION													PASS / FAIL
/		SINGLE FUSION EXTRUSION													PASS / FAIL

88 ft.: Total Seam Length this page.  
10279 ft.: Previous Total Seam Length.  
10367 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-98

SHEET 3; PAGE 1 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
535 / 723	54	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - E05	(S)/AS	AIR CHANNEL OR VACUUM BOX	840	845	30	29	1	PASS/FAIL
723 / 724	56	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - E05	(S)/AS	AIR CHANNEL OR VACUUM BOX	909	914	30	30	0	PASS/FAIL
724 / 725	56	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - E05	(S)/AS	AIR CHANNEL OR VACUUM BOX	917	922	30	30	-	PASS/FAIL
725 / 726	59	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - E05	(S)/AS	AIR CHANNEL OR VACUUM BOX	942	947	30	30	-	PASS/FAIL
726 / 727	60	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - E05	(S)/AS	AIR CHANNEL OR VACUUM BOX	935	940	30	30	-	PASS/FAIL

285 ft.: Total Seam Length this page.  
10367 ft.: Previous Total Seam Length.  
10652 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 2 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
727/728	64	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - E05	(T)/AS	AIR CHANNEL OR VACUUM BOX	1003	1008	30	30	-	(PASS)/FAIL
728/729	63	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - E05	(T)/AS	AIR CHANNEL OR VACUUM BOX	955	1000	30	30	-	(PASS)/FAIL
729/730	64	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - E05	(T)/AS	AIR CHANNEL OR VACUUM BOX	1035	1040	30	30	-	(PASS)/FAIL
730/731	68	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - E05	(T)/AS	AIR CHANNEL OR VACUUM BOX	1053	1058	30	30	-	(PASS)/FAIL
731/732	65	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - E05	(T)/AS	AIR CHANNEL OR VACUUM BOX	1029	1034	30	29	-	(PASS)/FAIL

324 ft.: Total Seam Length this page.  
10652 ft.: Previous Total Seam Length.  
10976 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-12-08  
SHEET 3; PAGE 3 OF 19

CQA TECHNICIANS: Ted Stiles  
Allen Smith

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T32/T33	66	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EWS	T/S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1/25	1/30	30	30	PASS / FAIL
T33/T34	67	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EWS	T/S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1/27	1/32	30	30	PASS / FAIL
T34/T35	70	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EWS	T/S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1/48	1/53	30	29	PASS / FAIL
T35/T36	73	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EWS	T/S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1/54	1/59	30	30	PASS / FAIL
T36/T37	75	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EWS	T/S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	12/15	12/20	30	29	PASS / FAIL

351 ft.: Total Seam Length this page.  
10976 ft.: Previous Total Seam Length.  
11327 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 4 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T37/T38	75	DOUBLE FUSION	D10	AK	5.0	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	1222	1227	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION													
T38/T39	78	DOUBLE FUSION	W19	SB	4.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	117	122	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION													
S37/S39	275	DOUBLE FUSION	D10	AK	5.0	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	503	508	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION													
S37/S38	110	DOUBLE FUSION	D10	AK	5.0	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	503	508	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION													
S38/S39	23	DOUBLE FUSION	W19	SB	4.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	235	240	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION													

561 ft.: Total Seam Length this page.  
1327 ft.: Previous Total Seam Length.  
11888 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 5 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
539 / 541	175	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	508	513	34	29	1	PASS/FAIL
539 / 540	100	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	508	513	30	29	1	PASS/FAIL
538 / 540	113	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	508	513	30	29	1	PASS/FAIL
540 / 541	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	302	307	30	30	-	PASS/FAIL
541 / 543	72	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	517	522	30	30	-	PASS/FAIL

483 ft.: Total Seam Length this page.  
11888 ft.: Previous Total Seam Length.  
12371 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08

SHEET 3; PAGE 6 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
541/542	103	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	(TS)/AS	(AIR CHANNEL) OR VACUUM BOX	517	522	30	30	—	(PASS) FAIL
540/542	216	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	(TS)/AS	(AIR CHANNEL) OR VACUUM BOX	517	522	30	30	—	PASS / FAIL
542/543	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	(TS)/AS	(AIR CHANNEL) OR VACUUM BOX	343	348	30	30	—	PASS / FAIL
543/544	72	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13 W4	SN	5.5 6.5	800	0 - 4 4 - 20 20 - ESS	(TS)/AS	(AIR CHANNEL) OR VACUUM BOX	528 534	533 539	30 30	30 29	— 1	(PASS) FAIL (PASS) FAIL
542/544	320	DOUBLE FUSION SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - 3 3 - ESS	(TS)/AS	(AIR CHANNEL) OR VACUUM BOX	CAPPED R-		R-	00	—	(PASS) FAIL
										CAPPED R-		R-	30	—	PASS / FAIL
										714	719	30	30	—	(PASS) FAIL

734 ft.: Total Seam Length this page.  
12371 ft.: Previous Total Seam Length.  
13105 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 7 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
544/546	367	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - 321 321 - ESS	(S)AS	(AIR CHANNEL) OR VACUUM BOX	616	621	30	29	1	(PASS) FAIL
544/545	26	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - ESS	(S)AS	(AIR CHANNEL) OR VACUUM BOX	731	736	30	28	2	(PASS) FAIL
545/546	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - ESS	(S)AS	(AIR CHANNEL) OR VACUUM BOX	543	548	30	30	-	(PASS) FAIL
546/548	265	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - ESS	(S)AS	(AIR CHANNEL) OR VACUUM BOX	805	810	30	29	1	(PASS) FAIL
546/547	101	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - ESS	(S)AS	(AIR CHANNEL) OR VACUUM BOX	805	810	30	29	1	(PASS) FAIL

782 ft.: Total Seam Length this page.  
13105 ft.: Previous Total Seam Length.  
13887 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DATE: 3-12-58  
SHEET 3; PAGE 8 OF 19

CQA TECHNICIANS: Ted Stiles  
Allen Smith

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
545 / 547	28	<u>DOUBLE FUSION</u>	W19	SB	4.5	850	0 - ESS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	8:55	8:10	30	29	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION												
547 / 548	23	<u>DOUBLE FUSION</u>	W19	SB	4.5	850	0 - ESS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	5:50	5:55	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION												
536 / 537	362	<u>DOUBLE FUSION</u>	D13	EX	5.0	800	0 - ESS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	7:45	7:50	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION												
535 / 537	12	<u>DOUBLE FUSION</u>	D13	EX	5.0	800	0 - ESS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	7:45	7:50	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION												
548 / 550	168	<u>DOUBLE FUSION</u>	D10	AK	5.0	850	0 - ESS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	8:10	8:15	30	30	<u>PASS</u> / FAIL
		SINGLE FUSION EXTRUSION												

593 ft.: Total Seam Length this page.  
13887 ft.: Previous Total Seam Length.  
14480 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 9 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
548/549	98	<del>DOUBLE FUSION</del> SINGLE FUSION	D10	AK	5.0	850	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	814	819	30	30	-	(PASS) / FAIL
549/550	130	<del>DOUBLE FUSION</del> SINGLE FUSION	D10	AK	5.0	850	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	814	819	30	30	-	(PASS) / FAIL
549/550	23	<del>DOUBLE FUSION</del> SINGLE FUSION	W19	SB	4.5	850	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	608	613	30	29	1	(PASS) / FAIL
550/552	80	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	754	759	30	30	-	(PASS) / FAIL
550/551	89	<del>DOUBLE FUSION</del> SINGLE FUSION	W4	SN	6.5	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	754	759	30	30	-	(PASS) / FAIL

420 ft.: Total Seam Length this page.  
14480 ft.: Previous Total Seam Length.  
14900 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 10 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
549 / 551	228	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	754	759	30	30	(PASS) FAIL
551 / 552	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W4	SN	6.5	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	230	235	30	28	(PASS) FAIL
552 / 553	82	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	741	746	30	30	(PASS) FAIL
551 / 553	321	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10 D13	AK EX	5.0	850 800	0 - 120 120 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	741 729	746 734	30 30	29 1	(PASS) FAIL (PASS) FAIL
722 / 534	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - 15 15 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	314 322	319 327	30 30	30 30	(PASS) FAIL (PASS) FAIL

676 ft.: Total Seam Length this page.  
14900 ft.: Previous Total Seam Length.  
15576 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 11 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
T21/534	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	333	338	30	29	1	(P)ASS / FAIL
T21/533	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	333	338	30	29	1	(P)ASS / FAIL
T20/533	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	333	338	30	29	1	(P)ASS / FAIL
T20/532	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	355	400	30	28	2	(P)ASS / FAIL
T19/532	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	355	400	30	28	2	(P)ASS / FAIL

48 ft.: Total Seam Length this page.  
15576 ft.: Previous Total Seam Length.  
15624 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 12 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T19/30	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EUS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	828	833	30	30	-	<del>PASS</del> /FAIL
T18/530	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EUS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	828	833	30	30	-	<del>PASS</del> /FAIL
T18/528	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SH	4.0	800	0 - EUS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	403	408	30	29	1	<del>PASS</del> /FAIL
T17/528	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SH	4.0	800	0 - EUS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED R-139				<del>PASS</del> /FAIL	
T17/526	27	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EUS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	431	436	30	30	-	<del>PASS</del> /FAIL

67 ft.: Total Seam Length this page.  
15624 ft.: Previous Total Seam Length.  
15691 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 13 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
716 / 526	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED	R-			<del>PASS/FAIL</del> PASS / FAIL	
716 / 524	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	439	444	30	29	1	PASS / FAIL
715 / 524	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED	R-136				<del>PASS/FAIL</del> PASS / FAIL
715 / 522	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	445	450	30	30	-	PASS / FAIL
714 / 522	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED	R-143				<del>PASS/FAIL</del> PASS / FAIL

47 ft.: Total Seam Length this page.  
15691 ft.: Previous Total Seam Length.  
15738 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-88  
SHEET 3; PAGE 14 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING						RESULT (circle one)	
										TIME		PRESSURE (psi)		START	END		CHANGE
										START	END	START	END				
T14 / S21	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	842	847	30	28	2	PASS / FAIL		
T13 / S21	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	CAPPED			R-144		PASS / FAIL		
T13 / S20	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	855	900	30	30	-	PASS / FAIL		
T12 / S20	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	CAPPED			R-145		PASS / FAIL		
T12 / S19	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	905	910	30	29	1	PASS / FAIL		

68 ft.: Total Seam Length this page.  
15738 ft.: Previous Total Seam Length.  
15806 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-12-08  
SHEET 3; PAGE 15 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T11 / S19	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	<del>TS/AS</del>	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-140		<del>PASS/FAIL</del>	
T11 / S17	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	<del>TS/AS</del>	<del>AIR CHANNEL</del> OR VACUUM BOX	911	916	30	28	2	<del>PASS/FAIL</del>
T10 / S17	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	<del>TS/AS</del>	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-144			<del>PASS/FAIL</del>
T10 / S15	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	<del>TS/AS</del>	<del>AIR CHANNEL</del> OR VACUUM BOX	918	923	30	28	2	<del>PASS/FAIL</del>
T9 / S15	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	<del>TS/AS</del>	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-145			<del>PASS/FAIL</del>

47 ft.: Total Seam Length this page.  
15806 ft.: Previous Total Seam Length.  
15853 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 16 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T9/S13	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	920	925	30	30	-	PASS/FAIL
T8/S13	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-166			PASS/FAIL
T8/S12	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	923	928	30	29	1	PASS/FAIL
T7/S12	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-167			PASS/FAIL
T7/S11	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	927	932	30	29	1	PASS/FAIL

68 ft.: Total Seam Length this page.  
15853 ft.: Previous Total Seam Length.  
15921 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-98  
SHEET 3; PAGE 17 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T6 / 511	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-178		<del>PASS/FAIL</del> PASS / FAIL	
T6 / 59	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	935	940	30	28	2	<del>PASS/FAIL</del> PASS / FAIL
T5 / 59	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-177		<del>PASS/FAIL</del> PASS / FAIL	
T5 / 57	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	971	976	30	29	1	<del>PASS/FAIL</del> PASS / FAIL
T4 / 57	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E05	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED		R-176		<del>PASS/FAIL</del> PASS / FAIL	

47 ft.: Total Seam Length this page.  
15921 ft.: Previous Total Seam Length.  
15968 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08

SHEET 3; PAGE 18 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T4/S-6	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E-5	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	943	948	30	30	-	(PASS) / FAIL
T3/S-6	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E-5	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	CAPPED			R-175		(PASS) / FAIL
T3/S-5	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E-5	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	947	952	30	28	2	(PASS) / FAIL
T2/S-5	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E-5	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	CAPPED			R-173		(PASS) / FAIL
T2/S-3	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - E-5	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	950	955	30	30	-	(PASS) / FAIL

68 ft.: Total Seam Length this page.  
15968 ft.: Previous Total Seam Length.  
16036 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-12-08  
SHEET 3; PAGE 19 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
T1/S3	1	<del>DOUBLE FUSION</del>	DR3	SH	4.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	CAPPED	R-112			PASS/FAIL	
		SINGLE FUSION EXTRUSION												PASS/FAIL	
T1/S-1	21	<del>DOUBLE FUSION</del>	DR3	SH	4.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	953	958	30	29	1	PASS/FAIL
		SINGLE FUSION EXTRUSION												PASS/FAIL	
/		DOUBLE FUSION													PASS/FAIL
/		SINGLE FUSION													PASS/FAIL
/		EXTRUSION													PASS/FAIL
/		DOUBLE FUSION													PASS/FAIL
/		SINGLE FUSION													PASS/FAIL
/		EXTRUSION													PASS/FAIL
/		DOUBLE FUSION													PASS/FAIL
/		SINGLE FUSION													PASS/FAIL
/		EXTRUSION													PASS/FAIL

22 ft.: Total Seam Length this page.  
16036 ft.: Previous Total Seam Length.  
16058 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-98  
SHEET 3; PAGE 1 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
T-22/T-40	90	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1009	1014	30	29	1	PASS/FAIL
T-40/T-41	92	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1012	1017	30	30	-	PASS/FAIL
T-41/T-42	93	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1020	1025	30	30	-	PASS/FAIL
T-42/T-43	94	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1022	1027	30	30	-	PASS/FAIL
T-43/T-44	97	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1029	1034	30	30	-	PASS/FAIL

466 ft.: Total Seam Length this page.  
16058 ft.: Previous Total Seam Length.  
16524 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-13-08  
SHEET 3; PAGE 2 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING					RESULT (1) (circle one)
										TIME		PRESSURE (psi)		CHANGE	
										START	END	START	END		
744 / 745	98	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EWS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1030	1035	30	30	-	(PASS) FAIL
745 / 746	99	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EWS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1032	1037	30	29	1	(PASS) FAIL
746 / 747	100	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EWS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1034	1039	30	30	-	(PASS) FAIL
747 / 748	101	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SH	5.0	850	0 - EWS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1035	1040	30	30	-	(PASS) FAIL
748 / 749	102	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EWS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1055	1055	30	29	1	(PASS) FAIL

500 ft.: Total Seam Length this page.  
16524 ft.: Previous Total Seam Length.  
17024 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 3; PAGE 3 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
T49/T50	103	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	<del>TS</del> AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1108	1113	30	30	-	<del>PASS</del> FAIL
T50/T51	93	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	<del>TS</del> AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1125	1130	30	30	-	<del>PASS</del> FAIL
T51/T52	71	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	850	0 - EDS	<del>TS</del> AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1140	1145	30	30	-	<del>PASS</del> FAIL
T52/T53	44	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	<del>TS</del> AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1143	1148	30	30	-	<del>PASS</del> FAIL
T50/T55	15	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.0	800	0 - EDS	<del>TS</del> AS	<del>AIR CHANNEL</del> OR VACUUM BOX	317	322	30	30	-	<del>PASS</del> FAIL

326 ft.: Total Seam Length this page.  
17024 ft.: Previous Total Seam Length.  
17350 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-13-08  
SHEET 3; PAGE 4 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING						RESULT (1) (circle one)	
										TIME		PRESSURE (psi)		START	END		CHANGE
										START	END	START	END				
T51 / T55	28	<del>DOUBLE FUSION</del>	D10	AK	3.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	317	322	30	30	-	(PASS) FAIL		
		SINGLE FUSION EXTRUSION													PASS / FAIL		
T51 / T54	2	<del>DOUBLE FUSION</del>	D10	AK	3.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	317	322	30	30	-	(PASS) FAIL		
		SINGLE FUSION EXTRUSION													PASS / FAIL		
T52 / T54	29	<del>DOUBLE FUSION</del>	D10	AK	3.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	317	322	30	30	-	(PASS) FAIL		
		SINGLE FUSION EXTRUSION													PASS / FAIL		
T53 / T54	15	<del>DOUBLE FUSION</del>	D10	AK	3.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	317	322	30	30	-	(PASS) FAIL		
		SINGLE FUSION EXTRUSION													PASS / FAIL		
T53 / T56	26	<del>DOUBLE FUSION</del>	D10	AK	3.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	317	322	30	30	-	(PASS) FAIL		
		SINGLE FUSION EXTRUSION													PASS / FAIL		

100 ft.: Total Seam Length this page.  
17350 ft.: Previous Total Seam Length.  
17450 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 3; PAGE 5 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T54/T56	24	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(T)SAS	<del>AIR CHANNEL</del> OR VACUUM BOX	129	134	30	30	-	(PASS) FAIL
T54/T55	69	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	(T)SAS	<del>AIR CHANNEL</del> OR VACUUM BOX	123	128	30	29	1	(PASS) FAIL
T55/T57	108	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	(T)SAS	<del>AIR CHANNEL</del> OR VACUUM BOX	108	113	30	30	-	(PASS) FAIL
T57/T58	109	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - 5 5 - 9 9 - EDS	(T)SAS	<del>AIR CHANNEL</del> OR VACUUM BOX	153	158	30	29	1	(PASS) FAIL
T58/T59	111	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	(T)SAS	<del>AIR CHANNEL</del> OR VACUUM BOX	201	206	30	29	1	(PASS) FAIL
										255	300	30	30	-	(PASS) FAIL

421 ft.: Total Seam Length this page.  
17450 ft.: Previous Total Seam Length.  
17871 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 3; PAGE 6 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
T59/T60	117	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	T13	SH	5.0	800	0 - ESS	<del>TS</del> /AS	<del>AIR CHANNEL</del> OR VACUUM BOX	251	256	30	29	1	<del>PASS</del> /FAIL
T60/T61	116	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - ESS	<del>TS</del> /AS	<del>AIR CHANNEL</del> OR VACUUM BOX	329	334	30	30	-	PASS/FAIL
T61/T62	117	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - ESS	<del>TS</del> /AS	<del>AIR CHANNEL</del> OR VACUUM BOX	333	338	30	30	-	<del>PASS</del> /FAIL
T62/T63	119	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SH	5.0	800	0 - ESS	<del>TS</del> /AS	<del>AIR CHANNEL</del> OR VACUUM BOX	344	349	30	30	-	<del>PASS</del> /FAIL
T63/T64	121	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - ESS	<del>TS</del> /AS	<del>AIR CHANNEL</del> OR VACUUM BOX	403	408	30	30	-	<del>PASS</del> /FAIL

590 ft.: Total Seam Length this page.  
17871 ft.: Previous Total Seam Length.  
18461 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 3; PAGE 7 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			CHANGE
										START	END	START	END		
T64/T65	126	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:08	4:13	30	30	-	PASS/FAIL
T65/T66	129	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:39	4:44	30	30	-	PASS/FAIL
T66/T67	131	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:36	4:41	30	30	-	PASS/FAIL
T67/T68	137	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	5:18	5:23	30	30	-	PASS/FAIL
T68/T69	142	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	5:13	5:18	30	29	1	PASS/FAIL

665 ft.: Total Seam Length this page.  
18461 ft.: Previous Total Seam Length.  
19126 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08  
SHEET 3; PAGE 8 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			CHANGE
										START	END	START	END		
T69/770	150	DOUBLE FUSION SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	559	604	30	30	-	(PASS) FAIL
T50/553	10	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.0	850	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	500	505	30	30	-	(PASS) FAIL
T49/553	2	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	500	505	30	30	-	(PASS) FAIL
T49/552	21	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	504	509	30	30	-	(PASS) FAIL
T48/552	2	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	504	509	30	30	-	(PASS) FAIL

185 ft.: Total Seam Length this page.  
19126 ft.: Previous Total Seam Length.  
19311 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-13-88

SHEET 3; PAGE 9 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T48 / 550	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E55	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	<del>PASS</del> / FAIL
T47 / 550	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E55	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	<del>PASS</del> / FAIL
T47 / 548	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E55	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	<del>PASS</del> / FAIL
T46 / 548	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E55	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	<del>PASS</del> / FAIL
T46 / 546	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E55	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	<del>PASS</del> / FAIL

67 ft.: Total Seam Length this page.  
19311 ft.: Previous Total Seam Length.  
19378 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08

SHEET 3; PAGE 10 OF 13

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
T45/S46	2	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E-S	<u>(T)SAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	504	509	30	30	-	<u>(PASS)</u> / FAIL
T45/S44	21	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E-S	<u>(T)SAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	504	509	30	30	-	<u>(PASS)</u> / FAIL
T44/S44	2	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E-S	<u>(T)SAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	504	509	30	30	-	<u>(PASS)</u> / FAIL
T44/S43	21	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E-S	<u>(T)SAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	504	509	30	30	-	<u>(PASS)</u> / FAIL
T43/S43	2	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - E-S	<u>(T)SAS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	504	509	30	30	-	<u>(PASS)</u> / FAIL

48 ft.: Total Seam Length this page.  
19378 ft.: Previous Total Seam Length.  
19426 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-13-58  
SHEET 3; PAGE 11 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING					RESULT (1) (circle one)
										TIME		PRESSURE (psi)		CHANGE	
										START	END	START	END		
T43 / S41	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	PASS / FAIL
T42 / S41	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	PASS / FAIL
T42 / S39	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	PASS / FAIL
T41 / S39	2	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	PASS / FAIL
T41 / S37	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.0	800	0 - EDS	(T)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	504	509	30	30	-	PASS / FAIL

67 ft.: Total Seam Length this page.  
19426 ft.: Previous Total Seam Length.  
19493 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08

SHEET 3; PAGE 12 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T40 / 537	2	DOUBLE FUSION	D10	AK	4.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	504	509	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL
T40 / 536	21	DOUBLE FUSION	D10	AK	4.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	504	509	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL
T22 / 536	2	DOUBLE FUSION	D10	AK	4.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	CAPPED R-				PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL
S53 / 554	315	DOUBLE FUSION	D10	AK	4.5	800	0 - 260	TS/AS	AIR CHANNEL OR VACUUM BOX	721	726	30	30	PASS / FAIL
		SINGLE FUSION								725	730	30	30	PASS / FAIL
		EXTRUSION								735	740	30	30	PASS / FAIL
S54 / 555	139	DOUBLE FUSION	W19	SB	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	709	714	30	29	PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL

479 ft.: Total Seam Length this page.  
19493 ft.: Previous Total Seam Length.  
19972 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-13-08

SHEET 3; PAGE 13 OF 13

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
554 / 556	45	<del>DOUBLE FUSION</del>	W19	SB	4.5	850	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	709	714	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION													PASS / FAIL
555 / 556	23	<del>DOUBLE FUSION</del>	D13	SN	5.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	648	653	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION													PASS / FAIL
/	/	DOUBLE FUSION	/	/	/	/	/	/	/	/	/	/	/	/	PASS / FAIL
		SINGLE FUSION EXTRUSION													PASS / FAIL
/	/	DOUBLE FUSION	/	/	/	/	/	/	/	/	/	/	/	/	PASS / FAIL
		SINGLE FUSION EXTRUSION													PASS / FAIL
/	/	DOUBLE FUSION	/	/	/	/	/	/	/	/	/	/	/	/	PASS / FAIL
		SINGLE FUSION EXTRUSION													PASS / FAIL

68 ft.: Total Seam Length this page.  
19972 ft.: Previous Total Seam Length.  
20040 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-88  
SHEET 3; PAGE 1 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T71/T72	106	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	9/11	9/16	30	30	<u>PASS</u> / FAIL
T72/T73	141	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	6/8	6/13	30	30	<u>PASS</u> / FAIL
T73/T74	139	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	11/14	11/19	30	30	<u>PASS</u> / FAIL
T74/T75	141	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SN	5.0	800	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	11/20	11/25	30	30	<u>PASS</u> / FAIL
T75/T76	124	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	11/29	11/34	30	30	<u>PASS</u> / FAIL

651 ft.: Total Seam Length this page.  
20040 ft.: Previous Total Seam Length.  
20691 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-14-08  
SHEET 3; PAGE 2 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T75/T78	9	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	12/13	12/18	30	30	-	<u>PASS</u> / FAIL
T76/T78	23	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	W19	SB	4.5	850	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	12-4	12-9	30	29	1	<u>PASS</u> / FAIL
T76/T77	99	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	222	227	30	28	2	<u>PASS</u> / FAIL
T77/T78	9	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	222	227	30	28	2	<u>PASS</u> / FAIL
T78/T80	6	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	222	227	30	28	2	<u>PASS</u> / FAIL

146 ft.: Total Seam Length this page.  
20691 ft.: Previous Total Seam Length.  
20837 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08

SHEET 3; PAGE 3 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T77/780	23	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SH	3.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	1230	1235	30	30	-	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
T771/779	42	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SH	3.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	140	145	30	30	-	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
T776/784	21	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	222	227	30	28	2	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
T777/784	20	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	212	217	30	29	1	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
T55/553	1	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EDS	<u>TS/AS</u>	<u>AIR CHANNEL</u> OR VACUUM BOX	CAPPED		R-51			<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL

107 ft.: Total Seam Length this page.  
20837 ft.: Previous Total Seam Length.  
20944 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

DATE: 3-14-08  
SHEET 3; PAGE 4 OF 17

CQA TECHNICIANS: Ted Stiles  
Allen Smith

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
S53 / T57- T58	47	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	1105	1110	30	30	<u>PASS</u> / FAIL
S53 / T59- T60	46	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	1102	1107	30	30	<u>PASS</u> / FAIL
S54 / T60	2	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	CAPPED R-54				<u>PASS</u> / FAIL
S54 / T61- T66	138	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	305	310	30	29	<u>PASS</u> / FAIL
S55 / T67- T70	92	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	(TS)AS	AIR CHANNEL OR VACUUM BOX	317	322	30	28	<u>PASS</u> / FAIL

325 ft.: Total Seam Length this page.  
20944 ft.: Previous Total Seam Length.  
21269 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-14-08  
SHEET 3; PAGE 5 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T70/T72	41	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	246	251	30	28	2	PASS / FAIL
T70/T71	59	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SH	3.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	246	251	30	28	2	PASS / FAIL
T70/T79	47	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	255	300	30	30	-	PASS / FAIL
T77/T81	101	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - 97 97 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	342	347	30	29	1	PASS / FAIL
T80/T81	13	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	348	353	30	28	2	PASS / FAIL

261 \_\_\_\_\_ ft.: Total Seam Length this page.  
21269 \_\_\_\_\_ ft.: Previous Total Seam Length.  
21530 \_\_\_\_\_ ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-14091-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08

SHEET 3; PAGE 6 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
780/782	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	348	353	30	28	2	PASS/FAIL
781/782	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	237	242	30	27	1	PASS/FAIL
739/783	75	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	426	431	30	29	1	PASS/FAIL
783/786	74	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	419	424	30	30	-	PASS/FAIL
783/785	5	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	419	424	30	30	-	PASS/FAIL

178 ft.: Total Seam Length this page.  
21530 ft.: Previous Total Seam Length.  
21708 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-14-08  
SHEET 3; PAGE 7 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING					RESULT (circle one)
										TIME		PRESSURE (psi)		CHANGE	
										START	END	START	END		
785 / 786	23	DOUBLE FUSION	D19	TS	4.5	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:05	4:10	30	28	2	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
556 / 557	46	DOUBLE FUSION	D13	SH	4.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	5:00	5:05	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
557 / 558	72	DOUBLE FUSION	D13	SH	4.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:42	4:47	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
558 / 559	45	DOUBLE FUSION	D13	SH	4.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:34	4:39	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
555 / 557	52	DOUBLE FUSION	D13	SH	4.0	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	5:00	5:05	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					

238 ft.: Total Seam Length this page.  
21708 ft.: Previous Total Seam Length.  
21946 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 8 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
555/770	2	DOUBLE FUSION	G29	SB	-	250	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX					PASS/FAIL
		SINGLE FUSION EXTRUSION												PASS/FAIL
557/771	21	DOUBLE FUSION	D13	SN	3.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	521	526	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												PASS/FAIL
559/771	10	DOUBLE FUSION	D13	SN	3.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	521	526	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												PASS/FAIL
558/772	24	DOUBLE FUSION	D13	SN	3.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	521	526	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												PASS/FAIL
550/773	6	DOUBLE FUSION	D13	SN	3.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	521	526	30	30	PASS/FAIL
		SINGLE FUSION EXTRUSION												PASS/FAIL

63 ft.: Total Seam Length this page.  
21946 ft.: Previous Total Seam Length.  
22009 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08

SHEET 3; PAGE 9 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
559/773	17	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	05 - 655	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	521	526	30	30	-	<del>PASS</del> /FAIL
559/774	19	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - 605	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	521	526	30	30	-	<del>PASS</del> /FAIL
559/560	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - 605	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	530	535	30	30	-	<del>PASS</del> /FAIL
557/770	14	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	G29	SB	-	250 350	0 - 625	(TS)AS	AIR CHANNEL OR VACUUM BOX						<del>PASS</del> /FAIL
557/779	19	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - 605	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	CAPPED R-31				<del>PASS</del> /FAIL	

90 ft.: Total Seam Length this page.  
22009 ft.: Previous Total Seam Length.  
22099 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 10 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
560/774	5	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - EDS	(S)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	608	613	30	28	2	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
560/775	27	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - EDS	(S)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	608	613	30	28	2	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
560/776	15	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D13	SN	3.5	800	0 - EDS	(S)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	608	613	30	28	2	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
776/783	4	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	(S)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	CAPPED		R-1			<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL
783/784	19	<u>DOUBLE FUSION</u> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	(S)/AS	<u>AIR CHANNEL</u> OR VACUUM BOX	718	723	30	30	--	<u>PASS</u> /FAIL PASS/FAIL PASS/FAIL

70 ft.: Total Seam Length this page.  
22099 ft.: Previous Total Seam Length.  
22169 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-14-08

SHEET 3; PAGE 11 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T84 / T86	12	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/PAS	<del>AIR CHANNEL</del> OR VACUUM BOX	718	723	30	30	-	<del>PASS</del> / FAIL
T77 / T86	5	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/PAS	<del>AIR CHANNEL</del> OR VACUUM BOX	718	723	30	30	-	PASS / FAIL
T81 / T86	7	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	TS	4.5	800	0 - EDS	TS/PAS	<del>AIR CHANNEL</del> OR VACUUM BOX	712	719	30	29	1	<del>PASS</del> / FAIL
T23 / S37	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EDS	TS/PAS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL
T24 / S38	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EDS	TS/PAS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL

70 \_\_\_\_\_ ft.: Total Seam Length this page.  
22169 \_\_\_\_\_ ft.: Previous Total Seam Length.  
22239 \_\_\_\_\_ ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-14091-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 12 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T25/S40	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E25	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL
T26/S42	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E25	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	PASS / FAIL
T27/S44	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E25	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL
T28/S44	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E25	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	PASS / FAIL
T28/S45	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E25	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL

91 ft.: Total Seam Length this page.  
22239 ft.: Previous Total Seam Length.  
22330 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 13 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING					RESULT (circle one)
										TIME		PRESSURE (psi)		CHANGE	
										START	END	START	END		
729/545	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E/S	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	623	628	30	30	-	(PASS) FAIL
729/547	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E/S	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	623	628	30	30	-	(PASS) FAIL
730/547	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E/S	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	623	628	30	30	-	(PASS) FAIL
730/549	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E/S	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	623	628	30	30	-	(PASS) FAIL
731/549	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E/S	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	623	628	30	30	-	(PASS) FAIL

47 ft.: Total Seam Length this page.  
22330 ft.: Previous Total Seam Length.  
22377 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 14 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T31/551	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	(S)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL
T32/551	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	(S)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	PASS / FAIL
T32/553	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	(S)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL
T33/553	1	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	(S)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	PASS / FAIL
T33/554	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	(S)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	623	628	30	30	-	<del>PASS</del> / FAIL

68 ft.: Total Seam Length this page.  
22377 ft.: Previous Total Seam Length.  
22445 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-14001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 15 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
734 / 554	1	DOUBLE FUSION	D10	AK	3.5	850	0 - ESS	T/S/A/S	AIR CHANNEL OR VACUUM BOX	623	628	30	30	---	PASS / FAIL
		SINGLE FUSION EXTRUSION													
734 / 556	22	DOUBLE FUSION	D10	AK	3.5	850	0 - ESS	T/S/A/S	AIR CHANNEL OR VACUUM BOX	623	628	30	30	---	PASS / FAIL
		SINGLE FUSION EXTRUSION													
735 / 556	1	DOUBLE FUSION	D10	AK	3.5	850	0 - ESS	T/S/A/S	AIR CHANNEL OR VACUUM BOX	CAP P E D		12	19		PASS / FAIL
		SINGLE FUSION EXTRUSION													
735 / 557	22	DOUBLE FUSION	D10	AK	3.5	850	0 - ESS	T/S/A/S	AIR CHANNEL OR VACUUM BOX	727	732	30	30	---	PASS / FAIL
		SINGLE FUSION EXTRUSION													
736 / 557	1	DOUBLE FUSION	D10	AK	3.5	850	0 - ESS	T/S/A/S	AIR CHANNEL OR VACUUM BOX	727	732	30	30	---	PASS / FAIL
		SINGLE FUSION EXTRUSION													

47 ft.: Total Seam Length this page.  
22445 ft.: Previous Total Seam Length.  
22492 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-14-08  
SHEET 3; PAGE 16 OF 17  
GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING						RESULT (circle one)
										TIME		PRESSURE (psi)		CHANGE		
										START	END	START	END	START	END	
T36 / 558	21	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - E05	TSAS	AIR CHANNEL OR VACUUM BOX	727	737	30	30	-	<del>PASS</del> FAIL	
T37 / 558	2	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - E05	TSAS	AIR CHANNEL OR VACUUM BOX	727	732	30	30	-	<del>PASS</del> FAIL	
T37 / 559	21	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - E05	TSAS	AIR CHANNEL OR VACUUM BOX	727	732	30	30	-	<del>PASS</del> FAIL	
T38 / 554	2	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - E05	TSAS	AIR CHANNEL OR VACUUM BOX	727	732	30	30	-	<del>PASS</del> FAIL	
T38 / 560	21	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - E05	TSAS	AIR CHANNEL OR VACUUM BOX	727	732	30	30	-	<del>PASS</del> FAIL	

67 ft.: Total Seam Length this page.  
22492 ft.: Previous Total Seam Length.  
22559 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-14-08  
SHEET 3; PAGE 17 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
739 / 560	19	DOUBLE FUSION	D10	AK	3.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	727	732	30	30	PASS / FAIL	
		SINGLE FUSION EXTRUSION													PASS / FAIL
739 / 776	6	DOUBLE FUSION	D10	AK	3.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	CAPPED R-8				PASS / FAIL	
		SINGLE FUSION EXTRUSION													PASS / FAIL
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL	
		SINGLE FUSION													PASS / FAIL
		EXTRUSION													PASS / FAIL
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL	
		SINGLE FUSION													PASS / FAIL
		EXTRUSION													PASS / FAIL
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL	
		SINGLE FUSION													PASS / FAIL
		EXTRUSION													PASS / FAIL

25 ft.: Total Seam Length this page.  
22559 ft.: Previous Total Seam Length.  
22584 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LANMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-15-08  
SHEET 3; PAGE 1 OF 3

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 Refers To CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)			
										TIME		PRESSURE (psi)					
										START	END	START	END		CHANGE		
C-11 / S-1	23	DOUBLE FUSION	D10	SN	4.5	800	0 - EDS	TSMS	AIR CHANNEL OR VACUUM BOX	1147	1152	30	30	-	PASS / FAIL		
		SINGLE FUSION EXTRUSION								PASS / FAIL							
C-11 / S-2	23	DOUBLE FUSION	D10	SN	4.5	800	0 - EDS	TSMS	AIR CHANNEL OR VACUUM BOX	1158	1203	30	30	-	PASS / FAIL		
		SINGLE FUSION EXTRUSION								PASS / FAIL							
C-11 / S-4	23	DOUBLE FUSION	D10	SN	4.5	800	0 - EDS	TSMS	AIR CHANNEL OR VACUUM BOX	1158	1203	30	30	-	PASS / FAIL		
		SINGLE FUSION EXTRUSION								PASS / FAIL							
C-11 / S-6	23	DOUBLE FUSION	D10	SN	4.5	800	0 - EDS	TSMS	AIR CHANNEL OR VACUUM BOX	1158	1203	30	30	-	PASS / FAIL		
		SINGLE FUSION EXTRUSION								PASS / FAIL							
C-11 / S-7	23	DOUBLE FUSION	D10	SN	4.5	800	0 - 7	TSMS	AIR CHANNEL OR VACUUM BOX	1201	1206	30	29	1	PASS / FAIL		
		7 - 11					CAPPED			R-354							
		11 - EDS					228			233	30	29	1	PASS / FAIL			

115 ft.: Total Seam Length this page.  
22584 ft.: Previous Total Seam Length.  
22699 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-15-08  
SHEET 3; PAGE 2 OF 3

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
C-11 / 5-8	23	<del>DOUBLE FUSION</del>	D10	SN	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	228	233	30	29	1	PASS/FAIL
		SINGLE FUSION EXTRUSION													
C-11 / 5-10	23	<del>DOUBLE FUSION</del>	D10	SN	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	228	233	30	29	1	PASS/FAIL
		SINGLE FUSION EXTRUSION													
C-11 / 5-12	23	<del>DOUBLE FUSION</del>	D10	SN	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	236	241	30	29	1	PASS/FAIL
		SINGLE FUSION EXTRUSION													
C-11 / 5-13	23	<del>DOUBLE FUSION</del>	D10	SN	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	311	316	30	30	-	PASS/FAIL
		SINGLE FUSION EXTRUSION													
C-11 / 5-14	23	<del>DOUBLE FUSION</del>	D10	SN	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	318	323	30	29	1	PASS/FAIL
		SINGLE FUSION EXTRUSION													

115 ft.: Total Seam Length this page.  
22699 ft.: Previous Total Seam Length.  
22814 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-15-08  
SHEET 3; PAGE 3 OF 3

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
C-11 / 5-16	23	DOUBLE FUSION	D10	SH	4.5	800	0 - 60s	TS/AS	AIR CHANNEL OR VACUUM BOX	318	323	30	29	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
C-11 / 518	23	DOUBLE FUSION	D10	SH	4.5	800	0 - 15	TS/AS	AIR CHANNEL OR VACUUM BOX	318	323	30	29	PASS / FAIL
		SINGLE FUSION EXTRUSION								1019	1024	30	30	PASS / FAIL
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
		SINGLE FUSION EXTRUSION												PASS / FAIL

46 ft.: Total Seam Length this page.  
22814 ft.: Previous Total Seam Length.  
22860 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 1 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING					RESULT (circle one)
										TIME		PRESSURE (psi)		CHANGE	
										START	END	START	END		
C-11 / S20	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - 11	TS/AS	AIR CHANNEL OR VACUUM BOX	1023	1028	30	29	1	PASS / FAIL
							11 - E05			1026	1031	30	29	1	PASS / FAIL
C-11 / S21	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - 13	TS/AS	AIR CHANNEL OR VACUUM BOX	1028	1033	30	30	-	PASS / FAIL
							13 - E05			1048	1053	30	29	1	PASS / FAIL
C-11 / S22	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	TS/AS	AIR CHANNEL OR VACUUM BOX	1048	1053	30	29	1	PASS / FAIL
							-			-	-	-	-	-	-
C-11 / S23	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	TS/AS	AIR CHANNEL OR VACUUM BOX	1048	1053	30	29	1	PASS / FAIL
							-			-	-	-	-	-	-
C-11 / S25	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - E05	TS/AS	AIR CHANNEL OR VACUUM BOX	215	220	30	28	2	PASS / FAIL
							-			-	-	-	-	-	-

115 ft.: Total Seam Length this page.  
22860 ft.: Previous Total Seam Length.  
22975 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 2 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

*C-11 Refers to CELL 11*

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)			
										TIME		PRESSURE (psi)					
										START	END	START	END				
C-11 / S27	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	TS/AS	AIR CHANNEL OR VACUUM BOX	227	232	30	29	PASS / FAIL			
													PASS / FAIL				
C-11 / S29	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	TS/AS	AIR CHANNEL OR VACUUM BOX	227	232	30	29	PASS / FAIL			
													PASS / FAIL				
C-11 / S31	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	TS/AS	AIR CHANNEL OR VACUUM BOX	227	232	30	29	PASS / FAIL			
													PASS / FAIL				
C-11 / S33	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EBS	TS/AS	AIR CHANNEL OR VACUUM BOX	227	232	30	29	PASS / FAIL			
													PASS / FAIL				
C-11 / S34	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - 4	TS/AS	AIR CHANNEL OR VACUUM BOX	227	232	30	29	PASS / FAIL			
													PASS / FAIL				
													PASS / FAIL				
							4 - 6					30	29	1	PASS / FAIL		
							6 - EBS					296	251	30	28	2	PASS / FAIL

115 ft.: Total Seam Length this page.  
22975 ft.: Previous Total Seam Length.  
23090 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 3 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

*C-11 REFERS TO CELL 11*

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11 / S35	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 7	TS/AS	AIR CHANNEL OR VACUUM BOX	246	251	30	28	2	PASS/FAIL
		SINGLE FUSION EXTRUSION					CAPPED				R-404		PASS/FAIL		
		DOUBLE FUSION					256			301	30	30	-	PASS/FAIL	
C-11 / T23	23	SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	256	301	30	30	-	PASS/FAIL
		DOUBLE FUSION											PASS/FAIL		
		SINGLE FUSION EXTRUSION												PASS/FAIL	
C-11 / T24	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 15	TS/AS	AIR CHANNEL OR VACUUM BOX	256	301	30	30	-	PASS/FAIL
		SINGLE FUSION EXTRUSION					CAPPED				R-414		PASS/FAIL		
		DOUBLE FUSION					407			412	30	30	-	PASS/FAIL	
C-11 / T25	23	SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - 3	TS/AS	AIR CHANNEL OR VACUUM BOX	CAPPED		R-415			PASS/FAIL
		DOUBLE FUSION					414			419	30	28	2	PASS/FAIL	
		SINGLE FUSION EXTRUSION					421			426	30	28	2	PASS/FAIL	
C-11 / T26	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 9	TS/AS	AIR CHANNEL OR VACUUM BOX	421	426	30	28	2	PASS/FAIL
		SINGLE FUSION EXTRUSION					428			433	30	29	1	PASS/FAIL	
		DOUBLE FUSION					CAPPED				R-420		PASS/FAIL		
							18 - EDS			436	441	30	28	2	PASS/FAIL

115 ft.: Total Seam Length this page.  
23090 ft.: Previous Total Seam Length.  
23205 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 4 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11/T27	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 7	TS/AS	AIR CHANNEL OR VACUUM BOX	436	441	30	28	2	PASS/FAIL
		SINGLE FUSION EXTRUSION								442	447	30	29	1	PASS/FAIL
C-11/T28	23	DOUBLE FUSION	D10	AK	3.5	850	0 - E05	TS/AS	AIR CHANNEL OR VACUUM BOX	449	454	30	28	2	PASS/FAIL
		SINGLE FUSION EXTRUSION													PASS/FAIL
C-11/T29	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 3	TS/AS	AIR CHANNEL OR VACUUM BOX	449	454	30	28	2	PASS/FAIL
		SINGLE FUSION								456	501	30	29	1	PASS/FAIL
		EXTRUSION								CAPPED					PASS/FAIL
- / -	-	DOUBLE FUSION	-	-	-	-	19 - E05	TS/AS	AIR CHANNEL OR VACUUM BOX	509	514	30	28	2	PASS/FAIL
		SINGLE FUSION													PASS/FAIL
		EXTRUSION													PASS/FAIL
C-11/T30	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 6	TS/AS	AIR CHANNEL OR VACUUM BOX	509	514	30	28	2	PASS/FAIL
		SINGLE FUSION								519	524	30	29	1	PASS/FAIL
		EXTRUSION								526	531	30	30	-	PASS/FAIL
							22 - E05			CAPPED					PASS/FAIL

92 ft.: Total Seam Length this page.  
23205 ft.: Previous Total Seam Length.  
23297 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 5 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11 / T31	23	DOUBLE FUSION	D10	AK	3.5	850	0 - EDS	TS/AS	AIR CHANNELLED OR VACUUM BOX	CAPPED	R-438			PASS/FAIL	
		SINGLE FUSION EXTRUSION											PASS / FAIL		
C-11 / T32	23	DOUBLE FUSION	G29	SB	-	250 350	0 - EDS	TS/AS	AIR CHANNELLED OR VACUUM BOX					PASS / FAIL	
		SINGLE FUSION EXTRUSION											PASS / FAIL		
C-11 / T33	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 7	TS/AS	AIR CHANNELLED OR VACUUM BOX	610	615	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION								CAPPED	R-440			PASS/FAIL	
		DOUBLE FUSION								617	622	30	30	-	PASS / FAIL
C-11 / T34	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 17	TS/AS	AIR CHANNELLED OR VACUUM BOX	617	622	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								624	629	30	29	1	PASS / FAIL
		DOUBLE FUSION								624	629	30	29	1	PASS / FAIL
C-11 / T35	23	DOUBLE FUSION	D10	AK	3.5	850	0 - 18	TS/AS	AIR CHANNELLED OR VACUUM BOX	624	629	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION								640	645	30	28	2	PASS / FAIL

115 ft.: Total Seam Length this page.  
23297 ft.: Previous Total Seam Length.  
23412 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 6 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

*C-11 REFERS TO CELL 11*

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
C-11 / 736	23	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - EBS	TSAS	AIR CHANNEL OR VACUUM BOX	640	645	30	28	PASS/FAIL
		SINGLE FUSION EXTRUSION												
C-11 / 737	23	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - EBS	TSAS	AIR CHANNEL OR VACUUM BOX	640	645	30	28	PASS/FAIL
		SINGLE FUSION EXTRUSION												
C-11 / 738	23	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - EBS	TSAS	AIR CHANNEL OR VACUUM BOX	640	645	30	28	PASS/FAIL
		SINGLE FUSION EXTRUSION												
C-11 / 739	23	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - EBS	TSAS	AIR CHANNEL OR VACUUM BOX	640	645	30	28	PASS/FAIL
		SINGLE FUSION EXTRUSION												
C-11 / 783	23	<del>DOUBLE FUSION</del>	D10	AK	3.5	850	0 - EBS	TSAS	AIR CHANNEL OR VACUUM BOX	640	645	30	28	PASS/FAIL
		SINGLE FUSION EXTRUSION												

115 ft.: Total Seam Length this page.  
23412 ft.: Previous Total Seam Length.  
23527 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08  
SHEET 3; PAGE 7 OF 7

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

*C-11 REFERS TO CELL 11*

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
C-11 / 785	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	3.5	850	0 - 655	TS/AS	AIR CHANNEL OR VACUUM BOX	640	645	30	28	PASS / FAIL
/		DOUBLE FUSION SINGLE FUSION EXTRUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
/		DOUBLE FUSION SINGLE FUSION EXTRUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
/		DOUBLE FUSION SINGLE FUSION EXTRUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
/		DOUBLE FUSION SINGLE FUSION EXTRUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL
/		DOUBLE FUSION SINGLE FUSION EXTRUSION						TS/AS	AIR CHANNEL OR VACUUM BOX					PASS / FAIL

23 ft.: Total Seam Length this page.  
23527 ft.: Previous Total Seam Length.  
23550 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-19-08  
SHEET 3; PAGE 1 OF 3

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
561/562	91	DOUBLE FUSION	D13	SN	4.5	800	0 - EGS	TS/AS	AIR CHANNEL OR VACUUM BOX	1202	1207	30	30	-	PASS/FAIL
		SINGLE FUSION EXTRUSION													
561/563	301	DOUBLE FUSION	D13	SN	4.5	800	0 - EGS	TS/AS	AIR CHANNEL OR VACUUM BOX	1213	1218	30	30	-	PASS/FAIL
		SINGLE FUSION EXTRUSION													
562/563	23	DOUBLE FUSION	D10	AK	4.5	850	0 - EGS	TS/AS	AIR CHANNEL OR VACUUM BOX	1020	1025	30	30	-	PASS/FAIL
		SINGLE FUSION EXTRUSION													
562/565	88	DOUBLE FUSION	D13	SN	4.5	800	0 - EGS	TS/AS	AIR CHANNEL OR VACUUM BOX	1201	1206	30	27	3	PASS/FAIL
		SINGLE FUSION EXTRUSION													
563/565	117	DOUBLE FUSION	D13	SN	4.5	800	0 - EGS	TS/AS	AIR CHANNEL OR VACUUM BOX	1249	1254	30	29	1	PASS/FAIL
		SINGLE FUSION EXTRUSION													

620 ft.: Total Seam Length this page.  
23550 ft.: Previous Total Seam Length.  
24170 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-19-08  
SHEET 3; PAGE 2 OF 3

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
563/564	182	<del>DOUBLE FUSION</del>	D13	SN	4.5	800	0 - EBS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1259	1254	30	29	1	<del>PASS</del> FAIL
564/565	23	<del>DOUBLE FUSION</del>	D10	AK	4.5	850	0 - EBS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1142	1147	30	29	1	<del>PASS</del> FAIL
565/567	95	<del>DOUBLE FUSION</del>	D10	AK	4.5	850	0 - EBS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	100	105	30	30	-	<del>PASS</del> FAIL
565/566	106	<del>DOUBLE FUSION</del>	D10	AK	4.5	850	0 - EBS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	140	145	30	30	-	<del>PASS</del> FAIL
564/566	180	<del>DOUBLE FUSION</del>	D10	AK	4.5	850	0 - EBS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	140	145	30	30	-	<del>PASS</del> FAIL

586 ft.: Total Seam Length this page.  
24170 ft.: Previous Total Seam Length.  
24756 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-19-08

SHEET 3; PAGE 3 OF 3

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
566 / 567	23	DOUBLE FUSION	D10	AK	4.5	850	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	12-18	1223	30	30	-	PASS/FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
5-1 / 561	336	DOUBLE FUSION	D10	AK	4.5	850	0 - 235	TS/AS	AIR CHANNEL OR VACUUM BOX	518	523	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX						PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX						PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
/	/	DOUBLE FUSION						TS/AS	AIR CHANNEL OR VACUUM BOX						PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					

359 ft.: Total Seam Length this page.  
24756 ft.: Previous Total Seam Length.  
25115 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 1 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
S-68 / S-69	372	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(S)AS	AIR CHANNEL OR VACUUM BOX	952	957	30	30	-	(PASS) / FAIL
S-69 / S-71	255	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(S)AS	AIR CHANNEL OR VACUUM BOX	954	959	30	30	-	(PASS) / FAIL
S-69 / S-70	111	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(S)AS	AIR CHANNEL OR VACUUM BOX	954	959	30	30	-	(PASS) / FAIL
S-70 / S-71	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(S)AS	AIR CHANNEL OR VACUUM BOX	900	905	30	30	-	(PASS) / FAIL
T-1 / S-61	64	DOUBLE FUSION SINGLE FUSION EXTRUSION	G29	AP	-	250 350	0 - EDS	(S)AS	AIR CHANNEL OR VACUUM BOX						(PASS) / FAIL

825 ft.: Total Seam Length this page.  
25115 ft.: Previous Total Seam Length.  
25940 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 2 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
5-71 / 5-73	128	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	1053	1058	30	30	PASS / FAIL
5-71 / 5-72	125	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	1053	1058	30	30	PASS / FAIL
5-70 / 5-72	109	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	1053	1058	30	30	PASS / FAIL
5-72 / 5-73	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	919	924	30	29	PASS / FAIL
5-73 / 5-74	125	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(TS)AS	(AIR CHANNEL OR VACUUM BOX)	1105	1110	30	30	PASS / FAIL

510 ft.: Total Seam Length this page.  
25940 ft.: Previous Total Seam Length.  
26450 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 3 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
5-72 / 5-74	231	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1105	1110	30	30	-	PASS / FAIL
5-74 / 5-75	350	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1113	1118	30	30	-	PASS / FAIL
5-75 / 5-76	130	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1157	1202	30	30	-	PASS / FAIL
5-75 / 5-77	212	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1157	1202	30	30	-	PASS / FAIL
5-76 / 5-77	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	1006	1011	30	30	-	PASS / FAIL

946 ft.: Total Seam Length this page.  
26450 ft.: Previous Total Seam Length.  
27396 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 4 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
576 / 578	127	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1217	1222	30	30	-	(PASS) FAIL
577 / 578	136	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1217	1222	30	30	-	(PASS) FAIL
577 / 579	74	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1217	1222	30	30	-	(PASS) FAIL
578 / 579	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	1123	1128	30	30	-	(PASS) FAIL
578 / 580	259	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	<del>AIR CHANNEL</del> OR VACUUM BOX	132	137	30	30	-	(PASS) FAIL

619 ft.: Total Seam Length this page.  
27396 ft.: Previous Total Seam Length.  
28015 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08

SHEET 3; PAGE 5 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
5-79 / 80	72	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(S)/AS	AIR CHANNEL OR VACUUM BOX	132	137	30	30	-	(PASS) FAIL
5-80 / 81	75	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	HJ	4.5	800	0 - EDS	(S)/AS	AIR CHANNEL OR VACUUM BOX	253	258	30	30	-	(PASS) FAIL
5-80 / 82	250	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(S)/AS	AIR CHANNEL OR VACUUM BOX	253	258	30	30	-	(PASS) FAIL
5-81 / 82	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(S)/AS	AIR CHANNEL OR VACUUM BOX	1209	1214	30	29	1	(PASS) FAIL
5-81 / 84	70	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SH	4.5	800	0 - EDS	(S)/AS	AIR CHANNEL OR VACUUM BOX	224	229	30	30	0	(PASS) FAIL

490 ft.: Total Seam Length this page.  
28015 ft.: Previous Total Seam Length.  
28505 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 407-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-58

SHEET 3; PAGE 6 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
5-82 / 84	23	DOUBLE FUSION	D13	SN	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	3:15	3:20	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
5-82 / 83	226	DOUBLE FUSION	D13	SN	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	3:15	3:20	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
5-83 / 84	23	DOUBLE FUSION	D10	AK	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	2:08	2:13	30	29	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
5-84 / 85	90	DOUBLE FUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:00	4:05	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
5-83 / 85	224	DOUBLE FUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	4:00	4:05	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	

586 ft.: Total Seam Length this page.  
28505 ft.: Previous Total Seam Length.  
29091 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08

SHEET 3; PAGE 7 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
5- 85 / 86	73	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	336	341	30	30	-	PASS/FAIL
															PASS/FAIL
5- 85 / 87	235	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	336	341	30	30	-	PASS/FAIL
															PASS/FAIL
5- 86 / 87	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	232	237	30	30	-	PASS/FAIL
															PASS/FAIL
5- 86 / 88	70	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	423	428	30	30	-	PASS/FAIL
															PASS/FAIL
5- 87 / 88	159	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	426	431	30	29	1	PASS/FAIL
															PASS/FAIL

560 ft.: Total Seam Length this page.  
29091 ft.: Previous Total Seam Length.  
29651 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 007-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 8 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
5- / 5- / 87 / 89	75	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.0	800	0 - EDS	(T)S/AS	AIR CHANNEL OR VACUUM BOX	426	431	30	29	1	(PASS) / FAIL
5- / 5- / 88 / 89	23	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(T)S/AS	AIR CHANNEL OR VACUUM BOX	362	357	30	28	2	(PASS) / FAIL
5- / 5- / 88 / 90	225	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(T)S/AS	AIR CHANNEL OR VACUUM BOX	514	519	30	29	1	(PASS) / FAIL
5- / 5- / 89 / 90	72	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(T)S/AS	AIR CHANNEL OR VACUUM BOX	514	519	30	29	1	(PASS) / FAIL
5- / 5- / 91 / 92	134	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(T)S/AS	AIR CHANNEL OR VACUUM BOX	556	601	30	30	-	(PASS) / FAIL

529 ft.: Total Seam Length this page.  
29651 ft.: Previous Total Seam Length.  
30180 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 9 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
5- 92 / 5- 93	90	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	600	605	30	30	-	(PASS) FAIL PASS / FAIL PASS / FAIL
5- 93 / 5- 95	6	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	625	630	30	30	-	(PASS) FAIL PASS / FAIL PASS / FAIL
5- 93 / 5- 94	44	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	622	627	30	30	-	(PASS) FAIL PASS / FAIL PASS / FAIL
5- 94 / 5- 95	22	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	608	613	30	30	-	(PASS) FAIL PASS / FAIL PASS / FAIL
5- 96 / 5- 97	158	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(T)S/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	550	555	30	30	-	(PASS) FAIL PASS / FAIL PASS / FAIL

320 ft.: Total Seam Length this page.  
30180 ft.: Previous Total Seam Length.  
30500 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08

SHEET 3; PAGE 10 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
5-97 / 5-98	141	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	508	513	30	30	PASS/FAIL
														PASS/FAIL
5-98 / 5-99	125	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	500	505	30	30	PASS/FAIL
														PASS/FAIL
5-99 / 5-100	109	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	438	443	30	30	PASS/FAIL
														PASS/FAIL
5-100 / 5-101	93	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	633	638	30	30	PASS/FAIL
														PASS/FAIL
5-101 / 5-102	76	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	636	641	30	30	PASS/FAIL
														PASS/FAIL

544 ft.: Total Seam Length this page.  
30500 ft.: Previous Total Seam Length.  
31044 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08

SHEET 3; PAGE 11 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
5- 95 / 96	8	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EPS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	804	809	30	29	1	<del>PASS</del> / FAIL
5- 94 / 96	39	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EPS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	804	809	30	29	1	<del>PASS</del> / FAIL
5- 93 / 96	51	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EPS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	804	809	30	29	1	<del>PASS</del> / FAIL
5- 67 / 68	91	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EPS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	737	742	30	30	-	<del>PASS</del> / FAIL
5- 66 / 68	246	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - 246	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	737	742	30	30	-	<del>PASS</del> / FAIL

435 ft.: Total Seam Length this page.  
31044 ft.: Previous Total Seam Length.  
31479 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08

SHEET 3; PAGE 12 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
S-92 / S-96	50	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(S)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	757	802	30	30	-	PASS / FAIL
S-91 / S-96	24	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EDS	(S)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	757	802	30	30	-	PASS / FAIL
T-87 / S-102	52	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - 11 11 - EDS	(S)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	750 755	755 803	30 30	30 28	- 2	PASS / FAIL PASS / FAIL
T-88 / S-102	7	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(S)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	758	803	30	28	2	PASS / FAIL
T-87 / T-88	21	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D10	AK	4.5	800	0 - EDS	(S)/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	740	745	30	30	-	PASS / FAIL

154 ft.: Total Seam Length this page.  
31479 ft.: Previous Total Seam Length.  
31633 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 13 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING			RESULT (1) (circle one)	
										TIME		PRESSURE (psi)		
										START	END	START		END
T-87 / T-90	35	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS/AS)	AIR CHANNEL OR VACUUM BOX	702	707	30	30	(PASS) FAIL
T-88 / T-89	6	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.5	800	0 - EDS	(TS/AS)	AIR CHANNEL OR VACUUM BOX	716	721	30	29	(PASS) FAIL
T-87 / T-89	1	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.5	800	0 - EDS	(TS/AS)	AIR CHANNEL OR VACUUM BOX	740	745	30	30	(PASS) FAIL
T-89 / T-90	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	4.5	800	0 - EDS	(TS/AS)	AIR CHANNEL OR VACUUM BOX	743	748	30	28	(PASS) FAIL
T-90 / S-103	18	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS/AS)	AIR CHANNEL OR VACUUM BOX	805	810	30	29	(PASS) FAIL

83 ft.: Total Seam Length this page.  
31633 ft.: Previous Total Seam Length.  
31716 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 14 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
T- / S- 89 / 103	4	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	805	810	30	29	1	(PASS) / FAIL
S- / S- 103 / 104	10	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	812	817	30	29	1	(PASS) / FAIL
T- / S- 87 / 90	28	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	911	916	30	30	-	(PASS) / FAIL
T- / S- 90 / 90	28	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	918	923	30	29	1	(PASS) / FAIL
S- / S- 90 / 103	14	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	918	923	30	29	1	(PASS) / FAIL

84 ft.: Total Seam Length this page.  
31716 ft.: Previous Total Seam Length.  
31800 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 107-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-21-08  
SHEET 3; PAGE 15 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
5-90 / 5-104	19	<del>DOUBLE FUSION</del>	D10	AK	5.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	918	923	30	29	1	(PASS) FAIL
		SINGLE FUSION EXTRUSION													
5-90 / 5-91	10	<del>DOUBLE FUSION</del>	D19	NJ	4.5	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	816	821	30	28	2	(PASS) FAIL
		SINGLE FUSION EXTRUSION													
5-90 / 5-96	28	<del>DOUBLE FUSION</del>	D19	NJ	4.5	800	0 - 28	(TS)AS	AIR CHANNEL OR VACUUM BOX	823	828	30	29	1	(PASS) FAIL
		SINGLE FUSION EXTRUSION													
5-90 / 5-97	28	<del>DOUBLE FUSION</del>	D19	NJ	4.5	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	837	842	30	28	2	(PASS) FAIL
		SINGLE FUSION EXTRUSION													
5-90 / 5-98	28	<del>DOUBLE FUSION</del>	D19	NJ	4.5	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	837	842	30	28	2	(PASS) FAIL
		SINGLE FUSION EXTRUSION													

113 ft.: Total Seam Length this page.  
31800 ft.: Previous Total Seam Length.  
31913 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

COA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-21-08

SHEET 3; PAGE 16 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (1) (circle one)		
										TIME		PRESSURE (psi)				
										START	END	START	END		CHANGE	
5-90 / 5-99	25	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	837	842	30	28	2	(PASS) FAIL	
																PASS / FAIL
																PASS / FAIL
5-90 / 5-100	29	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	845	850	30	28	2	(PASS) FAIL	
																PASS / FAIL
																PASS / FAIL
5-90 / 5-101	28	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	845	850	30	28	2	(PASS) FAIL	
																PASS / FAIL
																PASS / FAIL
5-90 / 5-102	28	<del>DOUBLE FUSION</del> SINGLE FUSION EXTRUSION	D19	NJ	4.5	800	0 - EDS	TS/AS	<del>AIR CHANNEL</del> OR VACUUM BOX	845	850	30	28	2	(PASS) FAIL	
																PASS / FAIL
																PASS / FAIL
/		DOUBLE FUSION SINGLE FUSION EXTRUSION						TS/AS	AIR CHANNEL OR VACUUM BOX						PASS / FAIL	
																PASS / FAIL
																PASS / FAIL

110 ft.: Total Seam Length this page.  
31913 ft.: Previous Total Seam Length.  
32023 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-58

SHEET 3; PAGE 1 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		
5-66 / 5-68	37	DOUBLE FUSION SINGLE FUSION <del>EXTRUSION</del>	G 29	AP	-	250 350	246 - 283	TS/AS	AIR CHANNEL OR VACUUM BOX					PASS/FAIL	
7-85 / 7-91	8	DOUBLE FUSION SINGLE FUSION EXTRUSION	D 13	SH	4.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	1100	1105	30	29	1	PASS/FAIL
7-86 / 7-91	70	DOUBLE FUSION SINGLE FUSION EXTRUSION	D 13	SH	4.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	1100	1105	30	29	1	PASS/FAIL
7-91 / 7-92	68	DOUBLE FUSION SINGLE FUSION EXTRUSION	D 19	AK	4.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	1051	1056	30	30	-	PASS/FAIL
7-92 / 7-93	46	DOUBLE FUSION SINGLE FUSION EXTRUSION	D 19	AK	4.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	1108	1113	30	29	1	PASS/FAIL

229 ft.: Total Seam Length this page.  
32073 ft.: Previous Total Seam Length.  
32252 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 2 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T-94 / T-95	31	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.5	800	0 - EUS	(TS)AS	AIR CHANNEL OR VACUUM BOX	1114	1119	30	30	PASS / FAIL
T-95 / T-96	59	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.5	800	0 - EUS	(TS)AS	AIR CHANNEL OR VACUUM BOX	1127	1132	30	30	PASS / FAIL
T-96 / T-97	85	DOUBLE FUSION SINGLE FUSION EXTRUSION	D13	SN	4.5	800	0 - EUS	SS)AS	AIR CHANNEL OR VACUUM BOX	1146	1151	30	29	PASS / FAIL
T-97 / T-98	80	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.5	800	0 - EUS	(TS)AS	AIR CHANNEL OR VACUUM BOX	1150	1155	30	30	PASS / FAIL
T-98 / T-99	56	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.5	800	0 - EUS	(TS)AS	AIR CHANNEL OR VACUUM BOX	1202	1207	30	30	PASS / FAIL

311 ft.: Total Seam Length this page.  
32252 ft.: Previous Total Seam Length.  
32563 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 3 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T-99 / T-100	34	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.5	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	12/5	30	30	---	(PASS) / FAIL
T-93 / T-94	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	5/05	30	30	---	PASS / FAIL
T-93 / T-95	33	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	5/08	30	30	---	PASS / FAIL
T-92 / T-96	34	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	5/14	30	29	1	(PASS) / FAIL
T-92 / T-97	4	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(T)S/MAS	AIR CHANNEL OR VACUUM BOX	5/14	30	29	1	(PASS) / FAIL

128 ft.: Total Seam Length this page.  
32563 ft.: Previous Total Seam Length.  
32691 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 4 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T-91 / T-97	11	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	525	525	30	30	PASS / FAIL
T-81 / T-91	22	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	522	527	30	30	PASS / FAIL
T-81 / T-97	16	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	525	530	30	29	PASS / FAIL
T-81 / T-98	36	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	525	530	30	29	PASS / FAIL
T-81 / T-99	35	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EDS	(TS)AS	AIR CHANNEL OR VACUUM BOX	525	530	30	29	PASS / FAIL

120 ft.: Total Seam Length this page.  
32691 ft.: Previous Total Seam Length.  
32811 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAWMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 5 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
T-81 / T-100	10	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EUS	TS/AS	AIR CHANNEL OR VACUUM BOX	525	530	30	29	PASS/FAIL
T-82 / T-100	10	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EUS	TS/AS	AIR CHANNEL OR VACUUM BOX	525	530	30	29	PASS/FAIL
C-11 / T-91	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EUS	TS/AS	AIR CHANNEL OR VACUUM BOX	445	450	30	29	PASS/FAIL
C-11 / T-92	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EUS	TS/AS	AIR CHANNEL OR VACUUM BOX	445	450	30	29	PASS/FAIL
C-11 / T-93	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D19	AK	4.0	800	0 - EUS	TS/AS	AIR CHANNEL OR VACUUM BOX	445	450	30	29	PASS/FAIL

89 ft.: Total Seam Length this page.  
32811 ft.: Previous Total Seam Length.  
32900 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 07-1001-58

COA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 6 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 Refers to Cell 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	COA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)
										TIME		PRESSURE (psi)		
										START	END	START	END	
C-11 / 7-94	7	<del>DOUBLE FUSION</del>	D19	AK	4.0	800	0 - 605	(TS)AS	AIR CHANNEL OR VACUUM BOX	445	450	30	29	PASS / FAIL
		SINGLE FUSION EXTRUSION											PASS / FAIL	
C-11 / 5-91	156	<del>DOUBLE FUSION</del>	D10	NJ	3.5	800	0 - 13	(TS)AS	AIR CHANNEL OR VACUUM BOX	125	130	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION										PASS / FAIL		
												PASS / FAIL		
+	-	<del>DOUBLE FUSION</del>	-	-	-	-	20 - 52	(TS)AS	AIR CHANNEL OR VACUUM BOX	128	133	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION										PASS / FAIL		
												PASS / FAIL		
C-11 / 5-90	23	<del>DOUBLE FUSION</del>	D10	NJ	3.5	800	52 - 605	(TS)AS	AIR CHANNEL OR VACUUM BOX	136	141	30	29	PASS / FAIL
		SINGLE FUSION EXTRUSION										PASS / FAIL		
												PASS / FAIL		
C-11 / 5-88	23	<del>DOUBLE FUSION</del>	D10	NJ	3.5	800	0 - 5	(TS)AS	AIR CHANNEL OR VACUUM BOX	CAPPED	CAPPED	R-292	R-292	PASS / FAIL
		SINGLE FUSION EXTRUSION										PASS / FAIL		
												PASS / FAIL		
C-11 / 5-88	23	<del>DOUBLE FUSION</del>	D10	NJ	3.5	800	5 - 605	(TS)AS	AIR CHANNEL OR VACUUM BOX	313	318	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION										PASS / FAIL		
												PASS / FAIL		
C-11 / 5-88	23	<del>DOUBLE FUSION</del>	D10	NJ	3.5	800	0 - 605	(TS)AS	AIR CHANNEL OR VACUUM BOX	313	318	30	30	PASS / FAIL
		SINGLE FUSION EXTRUSION										PASS / FAIL		
												PASS / FAIL		

209 ft.: Total Seam Length this page.  
32900 ft.: Previous Total Seam Length.  
33109 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 7 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11 / 5-86	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	313	318	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
C-11 / 5-85	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	313	318	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
C-11 / 5-84	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	313	318	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
C-11 / 5-81	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - 5	TS/AS	AIR CHANNEL OR VACUUM BOX	CAPPED	R-302	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
C-11 / 5-80	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - EDS	TS/AS	AIR CHANNEL OR VACUUM BOX	420	425	30	30	-	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					

115 ft.: Total Seam Length this page.  
33109 ft.: Previous Total Seam Length.  
33224 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 8 OF 10

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11 / 5-78	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	420	425	30	30	-	PASS/FAIL
C-11 / 5-76	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	420	425	30	30	-	PASS/FAIL
C-11 / 5-75	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	420	425	30	30	-	PASS/FAIL
C-11 / 5-74	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	420	425	30	30	-	PASS/FAIL
C-11 / 5-73	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - 13 13 - 605	TS/AS	AIR CHANNEL OR VACUUM BOX	420 630	425 635	30 30	30 30	- -	PASS/FAIL PASS/FAIL

115 ft.: Total Seam Length this page.  
33224 ft.: Previous Total Seam Length.  
33339 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 3; PAGE 9 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11 / 5-71	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - E-55	TS/AS	AIR CHANNEL OR VACUUM BOX	630	635	30	30	-	PASS / FAIL
C-11 / 5-69	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - E-55	TS/AS	AIR CHANNEL OR VACUUM BOX	646	651	30	29	1	PASS / FAIL
C-11 / 5-68	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - E-55	TS/AS	AIR CHANNEL OR VACUUM BOX	700	705	30	29	1	PASS / FAIL
C-11 / 5-67	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - E-55	TS/AS	AIR CHANNEL OR VACUUM BOX	700	705	30	29	1	PASS / FAIL
C-11 / 5-65	23	DOUBLE FUSION SINGLE FUSION EXTRUSION	D10	NJ	3.5	800	0 - 12 12 - E-55	TS/AS	AIR CHANNEL OR VACUUM BOX	700	747	30	29	1	PASS / FAIL

115 ft.: Total Seam Length this page.  
33339 ft.: Previous Total Seam Length.  
33454 ft.: Cumulative Seam Length.

# FIELD SEAMING LOG & NONDESTRUCTIVE TESTING LOG

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 1077-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-98

SHEET 3; PAGE 10 OF 10

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

C-11 REFERS TO CELL 11

SEAM BETWEEN PANEL NUMBERS	SEAM LENGTH (ft.)	SEAMING METHOD (circle one)	MACHINE NUMBER	WELDER	MACHINE SPEED (ft./min.)	WELDING TEMP	SECTION OF SEAM TESTED	CQA TECH (circle one)	TEST METHOD	AIR CHANNEL TESTING				RESULT <sup>(1)</sup> (circle one)	
										TIME		PRESSURE (psi)			
										START	END	START	END		CHANGE
C-11 / S- 62	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	742	747	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
C-11 / S- 61	23	DOUBLE FUSION	D10	NJ	3.5	800	0 - ESS	TS/AS	AIR CHANNEL OR VACUUM BOX	742	747	30	29	1	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
/	/	DOUBLE FUSION	/	/	/	/	/	/	/	/	/	/	/	/	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
/	/	DOUBLE FUSION	/	/	/	/	/	/	/	/	/	/	/	/	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					
/	/	DOUBLE FUSION	/	/	/	/	/	/	/	/	/	/	/	/	PASS / FAIL
		SINGLE FUSION EXTRUSION								PASS / FAIL					

46 ft.: Total Seam Length this page.  
33454 ft.: Previous Total Seam Length.  
33500 ft.: Cumulative Seam Length.

**TABLE NO. 5**  
**PANEL REPAIRS**

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Rowl

DATE: 3-17-08

SHEET 5; PAGE 1 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R- 1	T-76/T-77	0+50 to 0+55	DS-42	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 2	T-73/T-74	0+75 to 0+80	DS-41	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 3	1	T-76/T-77/T-84	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 4	1	T-77/T-81/T-86	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 5	1	T-77/T-84/T-86	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 6	1	T-83/T-84/T-86	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 7	1	T-76/T-83/T-84/ T-39	Intersection DS-46	3 x 4	<u>PATCH</u> EXTRUSION	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 8	1	S-60/T-39/T-76/ T-83	Intersection	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 9	1	S-60/T-38/T-39	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 10	1	S-60/T-75/T-76	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R- 11	1	S-60/T-74/T-75	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Maul

DATE: 3-17-08

SHEET 5; PAGE 2 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-12	1	S-59/S-60/T-74	Intersection	2 x 3	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-13	1	S-59/S-60/T-38	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-14	1	S-59/T-37/T-38	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-15	1	S-58/S-59/T-37	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-16	1	S-58/T-36/T-37	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-17	1	S-57/S-58/T-36	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-18	1	S-57/T-35/T-36	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-19	1	S-56/S-57/T-34/ T-35	Intersection	2 x 3	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-20	1	S-54/S-56/T-34	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-21	1	S-54/T-33/T-34	Intersection	X	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL
R-22	S-54/S-56	0+20 to 0+25	DS-40	2 x 5	PATCH EXTRUSION	TS/AS(S)	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_

DATE: 3-17-08  
SHEET 5; PAGE 3 OF 09

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-23	S-53/S-54	2+70	Buen Out	2 x 2	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-24	S-53/S-54	2+60	Buen Out	1 x 1	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-25	S-51/S-53	2+20 to 2+25	DS-31	2 x 5	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-26	1	S-55/T-68/T-69	Intesection	X	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-27	S-55/T-68	0+15 to 0+20	DS-43	2 x 5	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-28	1	S-55/T-69/T-70	Intesection	X	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-29	1	S-55/S-57/T-70	Intesection	4 x 4	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-30	1	S-57/T-71/T-79/ T-79 extension	Intesection	2 x 2	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-31	T-79/S-57		Extension	3 x 20	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-32	S-57/T-70		SEAM	14' x	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL
R-33	1	T-70/T-71/T-79	Intesection	2 x 4	PATCH EXTRUSION	TS/AS(SA)	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08

SHEET 5; PAGE 4 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-34	1	S-55/S-56/S-57	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-35	1	S-54/S-55/S-56	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-36	1	S-58/S-59/T-73	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-37	1	S-59/T-73/T-74	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-38	1	S-53/S-54/T-33	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-39	1	S-53/T-32/T-33	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-40	S 153	3405 to 3410 12' wide of S-53/S-54	Bead	5'	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-41	1	S-51/S-53/T-32	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-42	1	T-51/T-31/T-32	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-43	1	S-49/S-51/T-31	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL
R-44	1	S-49/T-30/T-31	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>SA</u>	<u>PASS</u> /FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-17-08

SHEET 5; PAGE 5 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-45	S-49/T-30	0+10 to 0+15	DS-45	2 x 5	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-46	S-51/S-53	1+20	Welder Restart	3 x 3	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-47	1	S-55/T-67/T-68	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-48	1	S-54/S-55/T-66/ T-67	Intersection	2 x 4	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-49	1	S-54/T-65/T-66	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-50	1	S-54/T-64/T-65	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-51	1	S-54/T-63/T-64	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-52	1	S-54/T-62/T-63	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-53	1	S-54/T-61/T-62	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-54	1	S-53/S-54/T-60/ T-61	Intersection	3 x 3	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL
R-55	1	S-53/T-59/T-60	Intersection	X	PATCH EXTRUSION	TS/AS(SA)	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Haml

DATE: 3-17-08  
SHEET 5; PAGE 6 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-56	1	S-53/T-58/T-59	Intersection	2 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-57	1	S-53/T-50/T-55/T-57	Intersection	4 x 4	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-58	1	S-53/S-52/S-51	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-59	1	S-50/S-51/S-52	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-60	S-50/S-51	0+70 to 0+75	DS-30	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-61	1	S-49/S-50/S-51	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-62	1	S-48/S-49/S-50	Intersection	2 x 3	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-63	1	S-47/S-48/S-49	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-64	1	S-46/S-47/S-48	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-65	1	S-45/S-46/S-47	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL
R-66	1	S-47/S-49/T-30	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS:

Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08

SHEET 5; PAGE 7 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-67	1	S-47/T-29/T-30	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-68	1	S-45/S-47/T-28/T-29	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-69	1	S-44/S-45/T-27/T-28	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-70	1	S-42/S-44/T-26/T-27	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-71	T 172	0402 12' north of T-72/T-73	Installation Damage	2x2	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-72	1	S-44/S-45/S-46	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-73	1	T-72/T-73/S-58	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-74	S-44/S-46	3+32 to 3+37	DS-27	2x5	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-75	S-44/S-46	3+21	Ben-art	2x3	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-76	1	S-40/S-41/S-42	Intersection	X	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL
R-77	S-41/S-42	0+95 to 1+00	DS-25	2x5	<u>EXTRUSION</u>	TS/AS <u>(S)</u>	<u>PASS</u> / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
WUMMELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-50

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Rowl

DATE: 3-17-08  
SECRET 5; PAGE 8 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-78	1	S39/S40/S41	INT.	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-79	S-42 / S-44	0447 to 0452	DS 26	5 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-80	S-42 / S-44	0403	BURN OUT	1 x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-81	1	S-42/S-43/S-44	INT	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-82	S-43 / S-44	0460 to 0472	SEAM CAP	12 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-83	1	S-41/S-43/S-44	INT	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-84	T-37 / T-53	0405	SEAM CAP	5 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-85	S-21 / S-22	04381	AIR TEST HOLE	2 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-86	T-8 / T-9	@ ANCHOR TRENCH	SEAM CAP	4 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-87	S-99 / S-100	@ ANCHOR TRENCH	BURN OUT	2 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-88	S-43 / S-44	0420 to 0435	SEAM CAP	15 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Hand

DATE: 3-17-08

SHEET 5; PAGE 9 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-89	1	S-43/T-43/T-44	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-90	1	S-41/S-43/T-43	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-91	S-43/S-44	0104	Burn Out	1 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-92	1	S-41/T-42/T-43	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-93	1	S-39/S-41/T-42	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-94	1	S-39/T-41/T-42	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-95	1	S-37/S-39/T-41	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-96	T-42/T-43	0170 to 0175	DS-33	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-97	1	S-37/T-40/T-41	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-98	1	S-36/S-37/T-40	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-99	1	S-34/S-36/T-22/ T-40	Intersection	2 x 3	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/> SA	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles \_\_\_\_\_  
Allen Smith \_\_\_\_\_  
Stanley Haul \_\_\_\_\_

DATE: 3-17-08

SHEET 5; PAGE 10 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-100	S-34/T-22	0+11	Buen Out	1 x 2	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-101	S-34/T-22	0+15	Buen Out	1 x 3	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-102	1	S-33/S-34/T-21/ T-22	Intersection	2 x 4	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-103	1	S-33/T-20/T-21	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-104	1	S-32/S-33/T-20	Intersection	1 x 1	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-105	S-32/S-33	0+23	Puncture	2 x 3	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-106	S 133	0+25 Access panel	Scratches	23'	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-107	S 134	0+30	Scratches (14) 6" beads	X	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-108	S-33/S-34	0+45 to 0+50	DS-19	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-109	1	S-31/S-32/S-33	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL
R-110	S-36/S-37	0+45 to 0+50	DS-29	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/50	<u>PASS</u> /FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Shirley Paul

DATE: 3-17-08  
SHEET 5; PAGE 11 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R- 111	1	S-29/S-30/S-31	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 112	S-29/S-30	0+10 to 0+15	DS-16	2x5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 113	1	S-28/S-29/S-30	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 114	1	S-27/S-28/S-29	Intersection	2x2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 115	1	S-26/S-27/S-28	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 116	S-29/S-31	0+95 to 1+00	DS-17	2x5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 117	S-34/S-36	2+20 to 2+25	DS-20	2x5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 118	1	S-37/S-38/S-39	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 119	1	S-38/S-39/S-40	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 120	S-37/S-38	0+70 to 0+75	DS-24	2x5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL
R- 121	1	S-35/S-36/S-37	Intersection	X	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <u>SL</u>	<input checked="" type="radio"/> PASS/ <input type="radio"/> FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Hand

DATE: 3-17-08  
SHEET 5; PAGE 12 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-121	1	S-34/S-35/S-36	Intersection	X	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-123	S-34/S-36	3752	Buen Out	1 x 1	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-124	1	S-35/S-37/T-23	Intersection	2 x 6	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-125	1	T-23/T-24/S-37/ S-38	Intersection	X	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-126	1	T-24/T-25/S-38/ S-40	Intersection	X	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-127	1	T-25/T-26/S-40/ S-42	Intersection	X	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-128	1	S-23/S-24/S-25	Intersection	X	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-129	1	S-22/S-23/S-24	Intersection	X	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-130	1	S-24/S-25/S-26	Intersection	2 x 2	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-131	S 126	0+75 10' west of S26/S27	Puncture	1 x 1	PATCH EXTRUSION	TS/AS/60	PASS / FAIL
R-132	S 126	0+70 10' west of S26/S27	Puncture	1 x 1	PATCH EXTRUSION	TS/AS/60	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Kaul

DATE: 3-17-08

SHEET 5; PAGE 13 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-133	S-24/S-26	2+45 to 2+50	DS-14	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-134	S-21/S-22	1+95 to 2+00	DS-11	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-135	S-22/S-24	0+95 to 1+00	DS-13	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-136	1	S-22/S-24/T-15/ T-16	Intersection	2 x 4	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-137	S-24/T-16	0+10 to 0+15	DS-32	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-138	1	S-24/S-26/T-16/ T-17	Intersection	2 x 3	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-139	1	S-26/S-28/T-17/ T-18	Intersection	3 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-140	1	S-28/S-30/T-18/ T-19	Intersection	2 x 3	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-141	T-18/T-19	0+77	Burn Out	2 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-142	1	S-30/S-32/T-19/ T-20	Intersection	1 x 4	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL
R-143	1	S-21/S-22/T-14/ T-15	Intersection	1 x 4	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/ <del>SK</del>	<input checked="" type="radio"/> PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

### PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08  
SHEET 5; PAGE 14 OF 19

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R- 144	1	S-20/S-21/T-13/ T-14	Intersection	1 x 3	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 145	1	S-19/S-20/T-12/ T-13	Intersection	1 x 3	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 146	1	S-17/S-19/T-11/ T-12	Intersection	2 x 3	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 147	1	S-17/S-18/S-19	Intersection	X	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 148	1	S-18/S-19/S-20	Intersection	X	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 149	S-20/S-21	0+45 to 0+50	DS-10	2 x 5	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 150	S-17/S-18	0+45 to 0+50	DS-8	2 x 5	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 151	1	S-15/S-16/S-17	Intersection	X	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 152	1	S-16/S-17/S-18	Intersection	X	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 153	S-15/S-16	0+45 to 0+50	DS-7	2 x 5	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL
R- 154	1	S-13/S-14/S-15	Intersection	X	PATCH EXTRUSION	TS/AS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08

SHEET 5; PAGE 15 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-155	S-18/S-20	3+20 to 3+25	DS-9	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-156	S-10/S-12	1+70 to 1+75	DS-5	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-157	1	S-8/S-9/S-10	Intersection	x	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-158	1	S-7/S-8/S-9	Intersection	1 x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-159	S-6/S-7	1+70 to 1+75	DS-3	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-160	1	S-9/S-10/S-11	Intersection	x	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-161	1	S-10/S-11/S-12	Intersection	x	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-162	S-9/S-11	0+70 to 0+75	DS-4	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-163	S-12/S-13	1+20 to 1+25	DS-6	2 x 5	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-164	1	S-15/S-17/T-10/ T-11	Intersection	1 x 4	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL
R-165	1	S-13/S-15/T-9/ T-10	Intersection	1 x 4	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	TS/AS/SL	<input checked="" type="radio"/> PASS <input type="radio"/> FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

### PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08  
SHEET 5; PAGE 16 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-166	1	S-12/S-13/T-8/ T-9	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-167	1	S-11/S-12/T-7/ T-8	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-168	S-6/S-7	O+71	Buen Cut	1 x 1	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-169	1	S-4/S-5/S-6	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-170	1	S-3/S-4/S-5	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-171	S-1/S-3	O+95 to 1+00	DS-1	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-172	1	S-1/S-3/T-1/ T-2	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-173	1	S-3/S-5/T-2/ T-3	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-174	T/3	O+10 10' west of T-3/T-4	Puncture	1 x 1	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-175	1	S-5/S-6/T-3/ T-4	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL
R-176	1	S-6/S-7/T-4/ T-5	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <u>SA</u>	<u>PASS</u> /FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08

SHEET 5; PAGE 17 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-177	1	S-7/S-9/T-5/ T-6	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-178	1	S-9/S-11/T-6/ T-7	Intersection	1 x 4	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-179	T-7/T-8	0+45 to 0+50	DS-12	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-180	S-4/S-6	1+45 to 1+50	DS-2	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-181	1	S-2/S-3/S-4	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-182	1	S-1/S-2/S-3	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-183	T-14/T-15	@ Anchor Trench	Buen Out	2 x 3	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-184	T-20/T-21	0+20 to 0+25	DS-21	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-185	1	S-46/T-45/T-46	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-186	1	S-44/S-46/T-45	Intersection	X	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL
R-187	S-44/T-45	0+15 to 0+20	DS-39	2 x 5	<u>PATCH</u> EXTRUSION	TS/AS/ <del>SR</del>	<u>PASS</u> / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Raul

DATE: 3-17-08  
SHEET 5; PAGE 18 OF 17

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-188	1	S-43/S-44/T-44	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-189	1	S-46/S-48/T-46	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-190	1	S-48/T-46/T-47	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-191	1	S-48/S-50/T-47	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-192	1	S-50/T-47/T-48	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-193	1	S-50/S-52/T-48	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-194	1	S-52/T-48/T-49	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-195	T-47/T-48	0+45 to 0+50	DS-34	2 x 5	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-196	T-47/T-48	⊗ Anchor Trench	Buen Out	3 x 4	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-197	1	T-53/T-54/T-56	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL
R-198	1	T-52/T-53/T-54	Intersection	X	<u>PATCH</u> <u>EXTRUSION</u>	TS/AS <u>AS</u>	<u>PASS</u> /FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

### PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Auld

DATE: 3-17-06  
SHEET 5; PAGE 19 OF 19

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R- 199	T-52/T-54	0+10 to 0+15	DS-35	2x5	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 200	1	T-51/T-52/T-54	Intersection	X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 201	1	T-51/T-54/T-55	Intersection	X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 202	1	T-50/T-51/T-55	Intersection	X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 203	1	S-53/T-57/T-58	Intersection	X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 204	1	S-53/T-49/T-50	Intersection	X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 205	1	S-52/S-53/T-49	Intersection	X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 206	T-57/T-58	0+70 to 0+75	DS-36	2x5	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 207	T-61/T-62	0+20 to 0+25	DS-37	2x5	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R- 208	T-66/T-67	0+95 to 1+00	DS-38	2x5	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS <input checked="" type="radio"/>	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL
R-	1			X	<input type="radio"/> PATCH <input checked="" type="radio"/> EXTRUSION	TS/AS	<input type="radio"/> PASS <input checked="" type="radio"/> FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith  
Stanley Bond

DATE: 3-18-09

SHEET 5; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-209	S-33/S-31	2+53 to 2+58	DS-18	2 x 5	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-210	1	S-25/S-26/S-27	Intersection	1 x 2	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-211	S-22/S-24	1+63 to 1+68	Insufficient Overlap	5' x	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-212	1	S-30/S-31/S-32	Intersection	x	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-213	1	S-21 to S-24 0159 across S-22 to 0175	Wrinkle	30' x	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-214	1	R-134 across S-22	Wrinkle	22' x	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-215	S 139	0+46 4' east of S-37/S-39	Punctures	1 x 1	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-216	S-46/S-48	0+37 to 0+42	DS-28	2 x 5	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-217	T 167	1+29 5' south of T-66/T-67	Puncture	1 x 1	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-218	S-38/S-40	0+04	Insufficient Overlap	1' x	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL
R-219	1	S-20/S-21 3+11 to S-22/S-23/S-24	Wrinkle	44' x	PATCH EXTRUSION	TS/AS <u>SL</u>	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

### PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 1 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-220	1	S61/S62/S63	INT	2 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-221	S-1/S61	1+20	DS-50	5 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-222	S-1/S61	2+35	BURN OUT	1 x 1	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-223	1	T1/S-1/S61	INT. W/ EXTENSION PIECE	20 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-224	S63/S64	0+75	DS-49	5 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-225	1	S63/S64/S65	INT.	7 x 1	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-226	S-64/S-65	0+10	DS-51	5 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-227	1	S64/S65/S66	INT	7 x 1	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-228	1	S65/S66/S67	INT	2 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-229	1	S62/S63/S65	INT	2 x 2	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL
R-230	1	S66/S67/S68	INT	7 x 1	<del>PATCH</del> EXTRUSION	(T)/AS	(PASS)/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 2 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-231	5-5 66/67	0+01	SCRATCH	T x 3	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-232	5-5 66/68	1+20	DS 63	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-233	5-5 66/68	2+20	NO LAP	3 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-234	5-5 66/68	2+24	EXTENSION PIECE	22 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-235	5-5 66/68	2+68	EXTENSION PIECE	15 x 3	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-236	1	569/570/571	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-237	5-5 69/71	0+95	DS-52	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-238	1	571/572/573	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-239	1	572/573/574	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-240	1	570/571/572	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-241	5-5 70/72	0+70	DS-53	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 3 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-242	S-74/S-75	1+70	DS-54	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-243	1	575/576/577	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-244	S-75/S-76	0+20	DS-55	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-245	S-77/S-78	0+95	DS-56	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-246	1	578/579/580	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-247	1	577/578/579	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-248	S-82/S-83	1+95	DS-58	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-249	S-80/S-82	0+20	DS-57	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-250	1	582/583/584	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-251	1	581/582/584	INT	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-252	1	580/581/582	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 4 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-253	1	583/584/585	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-254	5-85 / 5-87	1+20	DS-59	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-255	1	587/588/589	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-256	1	588/589/590	INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-257	1	585/586/587	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-258	1	586/587/588	INT	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-259	5-88 / 5-90	0+45	DS-60	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-260	1	590/591/596	INT	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-261	1	590/596/597	INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-262	1	590/597/598	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-263	1	590/598/599	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 5 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-264	1	S90/S99/S100	INT	T x 3	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-265	1	S90/S100/S101	INT	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-266	1	S90/S101/S102	INT	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-267	1	T87/S90/S102	INT	3 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-268	T-15-87 / S-102	0+11	BURN OUT	2 x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-269	T-15-87 / S-90	0+15	DS-64	5 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-270	1	T87/T90/S90	INT	3 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-271	1	T90/S90/S103	INT	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-272	1	S90/S103/S104	INT	T x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-273	1	T89/T90/S103	INT	T x 1	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-274	1	T87/T88/T89/T90 T87/T89	INT w/ SEAM	3 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 6 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-275	1	T87/T88/S102	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-276	S-98 / S-99	O+45	DS-62	S x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-277	1	S94/S95/S96	INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-278	1	S93/S94/S95	INT	3 x 3	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-279	S-92 / S-93	O+20	DS-61	S x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-280	1	S93/S94/S96	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-281	1	S92/S93/S96	INT	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-282	S-93 / S-96	O+50	AIR TEST HOLE	2 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-283	S-92 / S-96	O+01	AIR TEST HOLE	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-284	1	S91/S92/S96	INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-285	S-91 / C-11	O+13	SEAM CAP	7 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08  
SHEET 5; PAGE 7 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

TABLE 5 PANEL REPAIR RECORD							
REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-286	S-91 / C-11	0+26 1' S <sub>2</sub> -74	SCRATCH (3)	4 x -	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-287	S-91 / C-11	0+52	AIR TEST HOLE	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-288	S-91 / C-11	0+75	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-289	S-91 / C-11	0+92	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-290	S-91 / C-11	1+14	C-11 INT.	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-291	S-91 / C-11	436	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-292	1	590/591/C-11	INT w/ SEAM CAP	6 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-293	1	588/590/C-11	INT	T x 3	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-294	1	586/588/C-11	INT	T x 2	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-295	S-86 / C-11	0+09	EXCESSIVE TRACK PRESSURE	1 x -	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL
R-296	1	585/586/C-11	INT	T x 3	PATCH <del>EXTRUSION</del>	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

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**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-297	S-85 / C-11	0+18 1' SOUTH	PUNCTURE	1 x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-298	S-85 / C-11	0+21	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-299	1	S84/S85/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-300	S-84 / C-11	0+01 1' SOUTH	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-301	S-84 / C-11	0+20	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-302	1	S81/S84/C-11	INT W/ 5' SEAM CAP	7 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-303	S-81 / C-11	0+03 2' SOUTH	TEAR	3 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-304	S-81 / C-11	0+19	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-305	1	S80/S81/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-306	1	S76/S77/S78	INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL
R-307	S-80 / C-11	0+09 1' SOUTH	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 9 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-308	S-80 / C-11	0+18	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-309	1	578/580/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-310	S-78 / C-11	0+10 1' SOUTH	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-311	S-78 / C-11	0+16 1'-SOUTH	SCRATCH (2)	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-312	S-78 / C-11	0+17	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-313	1	576/578/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-314	S-76 / C-11	0+08 2' SOUTH	SCRATCH (2)	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-315	S-76 / C-11	0+09	SCRATCH	4 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-316	S-76 / C-11	0+15 1' SOUTH	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-317	S-76 / C-11	0+16	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-318	S-76 / C-11	0+17 1' SOUTH	SCRATCH	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 10 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-319	S-76/c-11	0+21 1' SOUTH	SCRATCH (2)	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-320	- 1	S75/S76/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-321	S-75/c-11	0+D1 1' SOUTH	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-322	S-75/c-11	0+05	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-323	S-75/c-11	0+15	C-11 INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-324	S-75/c-11	0+18	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-325	1	S74/S75/C-11	INT w/ SCRATCH	T x 3	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-326	S-74/c-11	0+03	SCRATCH	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-327	S-74/c-11	0+14	C-11 INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-328	S-74/c-11	0+19	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-329	1	S73/S74/C-11	INT	4 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-22-08

SHEET 5; PAGE 11 OF 11

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-330	S-73 / C-11	0+06 1' SOUTH	SCRATCH	2 X -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-331	S-73 / C-11	0+13	AIR TEST HOLE	3 X 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-332	/	S71/S73/C-11	INT	T X 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-333	S-71 / C-11	0+03	SCRATCH	1 X -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-334	S-71 / C-11	0+12	C-11 INT	T X 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-335	/	S69/S71/C-11	INT	2 X 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-336	S-69 / C-11	0+11	C-11 INT	T X 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 1 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-337	S-69 / C-11	0+20 1' SOUTH	SCRATCH	1 x -	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-338	1	S68/S69 / C-11	INT	2 x 2	<del>PATCH</del> EXTRUSION	(T)AS	(PASS) / FAIL
R-339	S-68 / C-11	0+10	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-340	1	S67/S68 / C-11	INT	T x 1	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-341	S-67 / C-11	0+19	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-342	1	S65/S67 / C-11	INT	T x 1	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-343	S-65 / C-11	0+08	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-344	S-65 / C-11	0+12 SOUTH	TEAR	2 x 4	<del>PATCH</del> EXTRUSION	(T)AS	(PASS) / FAIL
R-345	1	S1/S61 / C-11	INT	2 x 4	<del>PATCH</del> EXTRUSION	(T)AS	(PASS) / FAIL
R-346	S-1 / C-11	0+05	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(T)AS	(PASS) / FAIL
R-347	1	S1/S-2 / C-11	INT	2 x 2	<del>PATCH</del> EXTRUSION	(T)AS	(PASS) / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-03

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**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-348	S-2 / C-11	0+04	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-349	1	S-2/S-4/C-11	INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-350	S-4 / C-11	0+03	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-351	1	S-4/S-6/C-11	INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-352	S-6 / C-11	0+02	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-353	1	S-6/S-7/C-11	INT	2 x 2	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) FAIL
R-354	S-7 / C-11	0+07	SEAM CAP	4 x 3	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) FAIL
R-355	S-7 / C-11	0+14 1' NORTH	PUNCTURE	1 x 1	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) FAIL
R-356	1	S-7/S-8/C-11	INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-357	S-8 / C-11	0+22	C-11 INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL
R-358	1	S-8/S-10/C-11	INT	T x 1	PATCH <del>EXTRUSION</del>	(TS)AS	(PASS) FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 3 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-359	S-10/c-11	0+21	C-11 INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-360	1	S10/S12/c-11	INT	3 x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-361	S-12/c-11	0+18	C-11 INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-362	1	S12/S13/c-11	INT	3 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-363	S-13/c-11	0+17	C-11 INT	T x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-364	1	S13/S14/c-11	INT	2 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-365	S-14/c-11	0+09	DS-47	5 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-366	S-14/c-11	0+17	C-11 INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-367	1	S14/S16/c-11	INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-368	S-16/c-11	0+16	C-11 INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-369	1	S16/S18/c-11	INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 4 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-370	S-18/c-11	0+15	C-11 INT	1 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-371	1	S18/S20/c-11	INT	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-372	S-20/c-11	0+11	AIR TEST HOLE	2 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-373	S-20/c-11	0+14	C-11 INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-374	1	S20/S21/c-11	INT	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-375	S-21/c-11	0+06	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-376	S-21/c-11	0+13	C-11 INT	1 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-377	1	S21/S22/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-378	S-22/c-11	0+13	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-379	1	S22/S23/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-380	S-23/c-11	0+12	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL

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## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 5 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-381	1	S23/S25/C-11	INT	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-382	S-25 / C-11	O+05 1' SOUTH	SCRATCH (3)	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-383	S-25 / C-11	O+10	SEAM CAP W/ S25/S27/C-11 INT	14 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-384	S-27 / C-11	O+10	SCRATCH	2 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-385	S-27 / C-11	O+18	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-386	S-25 / S-27	O+95	DS-15	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-387	S-29 / C-11	O+04	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-388	S-29 / C-11	O+09	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-389	S-29 / C-11	O+14 1' NORTH	CREASE	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-390	S-29 / C-11	O+22	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-391	1	S29/S31/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
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CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 6 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-392	S-31 / C-11	0+04	SCRATCH	3 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-393	S-31 / C-11	0+08	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-394	S-31 / C-11	0+13	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-395	S-31 / C-11	0+20	SCRATCH w/ S31/S33/C-11 INT	4 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-396	S-33 / C-11	0+06 1' SOUTH	SCRATCH	3 x -	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-397	S-33 / C-11	0+07	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-398	S-33 / C-11	0+10 1' SOUTH	SCRATCH	3 x -	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-399	S-33 / C-11	0+18 1' SOUTH	SCRATCH	2 x -	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-400	1	S33/S34/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-401	S-34 / C-11	0+04	SEAM CAP	3 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL
R-402	S-34 / C-11	0+17 1' SOUTH	SCRATCH	3 x -	<del>PATCH</del> EXTRUSION	T/S/AS	<del>PASS</del> /FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**PANEL REPAIR RECORD**

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 7 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-403	1	S34/S35/C-11	INT	T x 1	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-404	S35/C-11	0406	SEAM CAP w/ SCRATCH	4 x 3	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-405	1	T23/S35/C-11	INT	T x 1	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-406	1	S27/S29/C-11	INT	T x 1	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-407	T23/C-11	0404	C-11 INT	T x 1	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-408	T23/C-11	0418	SCRATCH	2 x -	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-409	1	T23/T24/C-11	INT	T x 1	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-410	T24/C-11	0402	SCRATCH (2)	3 x -	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-411	T24/C-11	0403	C-11 INT	T x 1	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-412	T24/C-11	0410 1' SOUTH	SCRATCH (2)	2 x -	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-413	T24/C-11	0413 1' SOUTH	SCRATCH (2)	3 x -	<del>PATCH</del> <del>EXTRUSION</del>	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 8 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-414	T-24/c-11	0+14	SEAM CAP	4 x 2	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-415	1	T24/T25/c-11	INT w/ SEAM CAP	3 x 2	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-416	T-25/c-11	0+19	SCRATCH (3)	1 x -	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-417	T-25/c-11	0+20	AIR TEST HOLE	1 x 1	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-418	1	T25/T26/c-11	INT	7 x 2	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-419	T-26/c-11	0+04	SCRATCH (4)	3 x -	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-420	T-26/c-11	0+09	DS-48	9 x 2	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-421	T-26/c-11	0+18 1' SOUTH	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-422	T-26/c-11	0+20 1' SOUTH	SCRATCH (3)	2 x -	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-423	1	T26/T27/c-11	INT	7 x 2	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL
R-424	T-27/c-11	0+01	SCRATCH (2)	2 x -	<del>PATCH</del> EXTRUSION	T/SAS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 9 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-425	T-27 / C-11	0+D2	SCRATCH (2)	1 x -	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-426	T-27 / C-11	0+D7	AIR TEST HOLE	2 x 1	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-427	1	T27/T28/C-11	INT	3 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-428	T-27 / T-28	0+45	DS- 22	5 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-429	T-28 / C-11	0+22	G-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-430	1	T28/T29/C-11	INT	T x 2	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-431	T-29 / C-11	0+D3	AIR TEST HOLE	2 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-432	T-29 / C-11	0+15	SEAM CAP	5 x 2	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-433	T-29 / C-11	0+21	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-434	1	T29/T30/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL
R-435	T-30 / C-11	0+06	AIR TEST HOLE	2 x 1	<del>PATCH</del> EXTRUSION	T/S/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 10 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-436	T-30 / C-11	0+13	AIR TEST HOLE	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-437	T-30 / C-11	0+20	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-438	1	T30/T31/C-11 # T31/T32/C-11	INT w/ T31/C-11 SEAM CAP	24 x 2	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-439	T-32 / C-11	0+18	SEAM CAP w/ T32/T33/C-11 INT	7 x 3	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-440	T-33 / C-11	0+07	SEAM CAP	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-441	T-33 / C-11	0+17	C-11 INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-442	1	T33/T34/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-443	T-34 / C-11	0+01	SCRATCH	2 x 3	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-444	T-34 / C-11	0+17	C-11 INT	2 x 1	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-445	1	T34/T35/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL
R-446	T-35 / C-11	0+02	SCRATCH	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 11 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-447	T-35/c-11	0+11	SCRATCH (4)	7 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-448	T-35/c-11	0+16	C-11 INT	T x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-449	T-35/c-11	0+18	AIR TEST HOLE	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-450	1	T35/T36/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-451	T-36/c-11	0+09	SCRATCH (2)	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-452	T-36/c-11	0+11	SCRATCH (3)	3 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-453	T-36/c-11	0+15	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-454	1	T36/T37/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-455	T-37/c-11	0+02 1'-SOUTH	SCRATCH (3)	3 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-456	T-37/c-11	0+05	SCRATCH (2)	2 x -	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL
R-457	T-37/c-11	0+10	SCRATCH	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08  
SHEET 5; PAGE 12 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-458	1	T37/T38/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-459	T-37 T-38	0+20	DS-23	5 x 2	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-460	T-38/c-11	0+06	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-461	T-38/c-11	0+10 1' SOUTH	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-462	T-38/c-11	0+12	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-463	1	T38/T39/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-464	T-39/c-11	0+02	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-465	T-39/c-11	0+05	SCRATCH	1 x -	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-466	T-39/c-11	0+09	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-467	1	T39/T83/c-11	INT	T x 1	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL
R-468	T-83/c-11	0+12	C-11 INT	T x 1	<del>PATCH</del> EXTRUSION	T/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 13 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-469	T-83 / C-11	0+15	SCRATCH (3)	2 x -	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-470	1	T83/T85/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-471	T-85 / C-11	0+08	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-472	1	T83/T85/T86	INT	T x 1	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-473	T-83 / T-86	0+45	DS-44	5 x 2	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-474	T-86 / T-91	0+20	DS-65	5 x 2	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-475	1	T85/T86/T91	INT	T x 1	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-476	T-85 / C-11	0+12	SEAM CAP W/ T85/T91/C-11 INT	11 x 3	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-477	T-91 / C-11	0+15	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-478	1	T91/T92/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL
R-479	T-92 / C-11	0+08	SCRATCH (5)	3 x -	<del>PATCH</del> EXTRUSION	(TS)AS	(PASS) / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08

SHEET 5; PAGE 14 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-480	T-92 / C-11	0+11	SCRATCH	2 x 2	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-481	1	T92/T93/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-482	T-93 / C-11	0+11	SCRATCH	2 x 3	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-483	T-93 / C-11	0+18	SCRATCH	3 x 2	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-484	1	T93/T94/C-11	INT	T x 1	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-485	1	T93/T94/T95	INT	T x 2	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-486	1	T92/T93/ T95/T96	INT	T x 2	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-487	T-92 / T-96	0+10	EXCESSIVE TRACK PRESSURE	1 x -	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-488	T-92 / T-96	0+31	EXCESSIVE TRACK PRESSURE	1 x -	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-489	1	T92/T96/T97	INT	T x 1	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL
R-490	1	T91/T92/T97	INT	T x 1	<del>PATCH</del> EXTRUSION	(T) / AS	(PASS) / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-98

SHEET 5; PAGE 15 OF 16

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-491	1	T81/T91/T97	INT	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-492	1	T81/T86/T91	INT	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-493	1	T81/T97/T98	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-494	T-97/T-98	0+45	DS 66	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-495	1	T81/T98/T99	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-496	1	T81/T99/T100	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-497	1	T81/T82/T100	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-498	T-82/T-100	0+08	BURN OUT	3 x 2	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-499	1	T80/T81/T82	INT	T x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-500	1	T77/T80/T81	INT	2 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL
R-501	T-77/T-81	0+97	BURN OUT	2 x 1	<del>PATCH</del> EXTRUSION	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-23-08  
SHEET 5; PAGE 16 OF 16

GEOMEMBRANE DESCRIPTION:  
Material: HDPE Textured & Smooth  
Thickness: 60 mil  
Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-502	/	T77/T78/T80	INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-503	/	T76/T77/T78	INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-504	/	T75/T76/T78	INT	4 x 2	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-505	/	T70/T71/T72	INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-506	/	S58/T71/T72	INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-507	/	S57/S58/T71	INT	T x 1	PATCH <del>EXTRUSION</del>	TS/AS	PASS/FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS/FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS/FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-24-08

SHEET 5; PAGE 1 OF 2

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-508	T-23 / C-11	0+17 1' SOUTH	SCRATCH	1 x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-509	S-13 / S-14	0+93 6' WEST	PUNCTURE	1 x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-510	S-13 / S-14	0+93 12' WEST	PUNCTURE	1 x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-511	S-13 / S-14	0+93 11' WEST	CREASE	2 x -	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-512	S-13 / S-14	0+93 8' WEST	CREASE	2 x -	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-513	S-61 / C-11	0+06	C-11 INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-514	1	S61/S62/C-11	INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-515	S-62 / C-11	0+07	C-11 INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-516	1	S62/S65/C-11	INT	T x 1	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-517	S-65 / C-11	0+18	SCRATCH (2)	2 x -	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL
R-518	S-67 / C-11	0+11	DS-68	5 x 2	<input checked="" type="radio"/> PATCH <input type="radio"/> EXTRUSION	<input checked="" type="radio"/> TS/AS	<input checked="" type="radio"/> PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 3-24-08  
SHEET 5; PAGE 2 OF 2

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-519	S-88/K-11	0+10	DS-67	5 x 2	<del>PATCH</del> EXTRUSION	TS/AS	<del>PASS</del> FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

## PANEL REPAIR RECORD

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

CQA TECHNICIANS: Ted Stiles  
Allen Smith

DATE: 4-19-08

SHEET 5; PAGE 1 OF 1

**GEOMEMBRANE DESCRIPTION:**

Material: HDPE Textured & Smooth

Thickness: 60 mil

Manufacturer: PolyFlex

**TABLE 5  
PANEL REPAIR RECORD**

REPAIR NO.	SEAM BETWEEN PANEL NO.	LOCATION	DESCRIPTION OF DAMAGE	SIZE OF REPAIR <sup>(1)</sup>	REPAIR (Circle One)	INSPECTOR (Circle One)	RESULTS (Circle One)
R-520	/	NORTH END OF WESTERN RAIN FLAP	TEAR AT END OF WELD (WIND DAMAGE)	1 X 1	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL
R-	/			X	PATCH EXTRUSION	TS/AS	PASS / FAIL

NOTE (1): "T" Indicates a T-Weld at the intersection of geomembrane panels.

**TABLE NO. 6**  
**FIELD DESTRUCTIVE SEAM STRENGTH TESTING**

**Demtech Services, Inc.**  
Placerville, California, USA

**CALIBRATION CERTIFICATE**

Customer Name: American Environmental Group, Ltd.

Tensiometer Model: Pro-Tester T-0100

Device Calibrated: S-Type load cell  
 Range: 0 - 750 lbs. Tension  
 Model No: M2405-750#  
 Serial No: 206380

Calibration Apparatus:

Reference load cell (S/N 204781)

A/D Module Model No: T-029  
 A/D Module Serial No: 3205206380  
 Channel No: N/A

Dead Weight:                      Reference Cell:

W1	<u>2</u>	R1	<u>2</u>
W2	<u>152</u>	R2	<u>152</u>
W3	<u>302</u>	R3	<u>302</u>

Indicator reading with no load: 0

Offset: 7.681366

Scale: 4.965460

Applied Force lbs.

Cell Response:

Deviation Error:

<u>2</u>
<u>52</u>
<u>102</u>
<u>152</u>
<u>202</u>
<u>252</u>
<u>302</u>

<u>2</u>
<u>52</u>
<u>102</u>
<u>152</u>
<u>202</u>
<u>252</u>
<u>302</u>

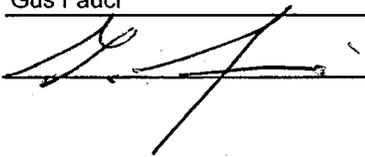
<u>0.00</u>

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F  
 Excitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician: Gus Fauci  


Date: 05/23/07

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 1  
SEAM BETWEEN PANELS NO.: P-S-1 / P-S-3  
DESTRUCTIVE SAMPLE LOCATION: STA. 10 + 95 to STA. 1 + 00  
REPAIR NO.: R- 171  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-12-08  
TENSIO METER TYPE / BRAND: DEMTEC 14  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>1</u> - 01	<u>153</u>	<u>159</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 02	<u>146</u>	<u>152</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 03	<u>171</u>	<u>157</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 04	<u>146</u>	<u>160</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 05	<u>145</u>	<u>166</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 06	X	<u>250</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 07		<u>256</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 08		<u>253</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 09		<u>260</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>1</u> - 10		<u>255</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 152  
Average of Peel Test Values, Outside Track (ppi) (2) 159  
Average of Shear Test Values (ppi) 255

CQA TECHNICIAN: [Signature]  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 2  
SEAM BETWEEN PANELS NO.: P-S-4 / P-S-6  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 45 to STA. 1 + 50  
REPAIR NO.: R- 180  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-12-08  
TENSIO METER TYPE / BRAND: DEWTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL	
	PEEL TEST <sup>(2)</sup>			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>2</u> -01	<u>149</u>	<u>133</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -02	<u>144</u>	<u>130</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -03	<u>149</u>	<u>163</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -04	<u>167</u>	<u>189</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -05	<u>183</u>	<u>190</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -06	X	<u>256</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -07		<u>251</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -08		<u>243</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -09		<u>253</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>2</u> -10		<u>250</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 158  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 161  
Average of Shear Test Values (ppi) 251

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 3  
SEAM BETWEEN PANELS NO.: P-S-6 / P-S-7  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 70 to STA. 1 + 75  
REPAIR NO.: R- 159  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-12-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206390  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>3</u> -01	<u>180</u>	<u>155</u>	X	$\leq 10$	X	X	FTB	SE-1	PASS
DS- <u>3</u> -02	<u>113</u>	<u>153</u>		$\leq 10$			FTB	SE-1	PASS
DS- <u>3</u> -03	<u>152</u>	<u>175</u>		$\leq 10$			FTB	SE-1	PASS
DS- <u>3</u> -04	<u>121</u>	<u>104</u>		$\leq 10$			FTB	SE-1	PASS
DS- <u>3</u> -05	<u>103</u>	<u>186</u>		$\leq 10$			FTB	SE-1	PASS
DS- <u>3</u> -06	X	X	X	$\geq 10$	$\geq 50$	FTB	SE-1	PASS	
DS- <u>3</u> -07				<u>244</u>	$\geq 10$	$\geq 50$	FTB	SE-1	PASS
DS- <u>3</u> -08				<u>232</u>	$\geq 10$	$\geq 50$	FTB	SE-1	PASS
DS- <u>3</u> -09				<u>240</u>	$\geq 10$	$\geq 50$	FTB	SE-1	PASS
DS- <u>3</u> -10				<u>241</u>	$\geq 10$	$\geq 50$	FTB	SE-1	PASS
DS- <u>3</u> -10		<u>244</u>		$\geq 10$	$\geq 50$	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 134  
Average of Peel Test Values, Outside Track (ppi) (2) 155  
Average of Shear Test Values (ppi) 240

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 4  
SEAM BETWEEN PANELS NO.: P- 5-9 / P- 5-11  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 70 to STA. 0 + 75  
REPAIR NO.: R- 162  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-12-08  
TENSIO METER TYPE / BRAND: DEMTERTH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL	
	PEEL TEST <sup>(2)</sup>			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>4</u> -01	<u>156</u>	<u>151</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>4</u> -02	<u>170</u>	<u>131</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>4</u> -03	<u>160</u>	<u>112</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>4</u> -04	<u>104</u>	<u>158</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>4</u> -05	<u>159</u>	<u>149</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>4</u> -06	X	X	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>4</u> -07				<u>251</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>4</u> -08				<u>254</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>4</u> -09				<u>247</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>4</u> -10				<u>249</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
		<u>243</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 150  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 140  
Average of Shear Test Values (ppi) 249

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 5  
SEAM BETWEEN PANELS NO.: P-510 / P-512  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 70 to STA. 1 + 75  
REPAIR NO.: R- 156  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-12-08  
TENSIO METER TYPE / BRAND: DEMTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 5 -01	138	140	≤10			FTB	SE-1	PASS
DS- 5 -02	146	149	≤10			FTB	SE-1	PASS
DS- 5 -03	154	146	≤10			FTB	SE-1	PASS
DS- 5 -04	145	144	≤10			FTB	SE-1	PASS
DS- 5 -05	111	141	≤10			FTB	SE-1	PASS
DS- 5 -06		250		≥10	≥50	FTB	SE-1	PASS
DS- 5 -07		254		≥10	≥50	FTB	SE-1	PASS
DS- 5 -08		250		≥10	≥50	FTB	SE-1	PASS
DS- 5 -09		249		≥10	≥50	FTB	SE-1	PASS
DS- 5 -10		248		≥10	≥50	FTB	SE-1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 139  
Average of Peel Test Values, Outside Track (ppi) (2) 144  
Average of Shear Test Values (ppi) 250

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 6  
SEAM BETWEEN PANELS NO.: P-5-12 / P-5-13  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 20 to STA. 1 + 25  
REPAIR NO.: R- 163  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-12-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL	
	PEEL TEST <sup>(2)</sup>			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>6</u> -01	<u>164</u>	<u>156</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>6</u> -02	<u>155</u>	<u>163</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>6</u> -03	<u>159</u>	<u>171</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>6</u> -04	<u>178</u>	<u>166</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>6</u> -05	<u>164</u>	<u>166</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>6</u> -06	X	X	X	<u>249</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>6</u> -07				<u>254</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>6</u> -08				<u>250</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>6</u> -09				<u>248</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>6</u> -10				<u>250</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 164  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 164  
Average of Shear Test Values (ppi) 250

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 7  
SEAM BETWEEN PANELS NO.: P-5-151 P-8-76  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 153  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL	
	PEEL TEST <sup>(2)</sup>			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>7</u> -01	<u>157</u>	<u>158</u>	X	<u>≤10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>7</u> -02	<u>147</u>	<u>164</u>		<u>≤10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>7</u> -03	<u>152</u>	<u>172</u>		<u>≤10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>7</u> -04	<u>146</u>	<u>147</u>		<u>≤10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>7</u> -05	<u>169</u>	<u>141</u>		<u>≤10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>7</u> -06	X	X	X	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>7</u> -07				<u>232</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>7</u> -08				<u>243</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>7</u> -09				<u>231</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>7</u> -10				<u>246</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
		<u>238</u>							

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 154  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 156  
Average of Shear Test Values (ppi) 238

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 8  
SEAM BETWEEN PANELS NO.: P-5-171 P-578  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 150  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>8</u> -01	<u>161</u>	<u>141</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -02	<u>153</u>	<u>153</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -03	<u>155</u>	<u>150</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -04	<u>163</u>	<u>161</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -05	<u>144</u>	<u>147</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -06	X	<u>240</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -07		<u>237</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -08		<u>230</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -09		<u>231</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>
DS- <u>8</u> -10		<u>209</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 155  
Average of Peel Test Values, Outside Track (ppi) (2) 150  
Average of Shear Test Values (ppi) 229

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 9  
SEAM BETWEEN PANELS NO.: P-S-18 / P-S-20  
DESTRUCTIVE SAMPLE LOCATION: STA. 3 + 20 to STA. 3 + 25  
REPAIR NO.: R- 155  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>9</u> -01	<u>142</u>	<u>154</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -02	<u>132</u>	<u>190</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -03	<u>154</u>	<u>148</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -04	<u>136</u>	<u>181</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -05	<u>135</u>	<u>139</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -06	X	<u>236</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -07		<u>238</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -08		<u>206</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -09		<u>221</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	
DS- <u>9</u> -10		<u>231</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE-1</u>	<u>PASS</u>	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 140  
Average of Peel Test Values, Outside Track (ppi) (2) 162  
Average of Shear Test Values (ppi) 226

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 10  
SEAM BETWEEN PANELS NO.: P-S-20/ P-S-21  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 149  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTERU  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 10 -01	138	174	X	≤ 10	X	FTB	SE-1	PASS	
DS- 10 -02	141	172		≤ 10		FTB	SE-1	PASS	
DS- 10 -03	140	153		≤ 10		FTB	SE-1	PASS	
DS- 10 -04	136	164		≤ 10		FTB	SE-1	PASS	
DS- 10 -05	133	176		≤ 10		FTB	SE-1	PASS	
DS- 10 -06	X	213	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 10 -07		211		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 10 -08		226		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 10 -09		236		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 10 -10		216		≥ 10	≥ 50	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 138  
Average of Peel Test Values, Outside Track (ppi) (2) 168  
Average of Shear Test Values (ppi) 220

CQA TECHNICIAN: [Signature]  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 11  
SEAM BETWEEN PANELS NO.: P-S-21 / P-S-22  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 95 to STA. 2 + 00  
REPAIR NO.: R- 134  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-10-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 11 - 01	130	149	X	≤ 10	X	FTB	SE-1	PASS	
DS- 11 - 02	131	137		≤ 10		FTB	SE-1	PASS	
DS- 11 - 03	169	152		≤ 10		FTB	SE-1	PASS	
DS- 11 - 04	142	142		≤ 10		FTB	SE-1	PASS	
DS- 11 - 05	156	171		≤ 10		FTB	SE-1	PASS	
DS- 11 - 06	X	X	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 11 - 07				227	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 11 - 08				220	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 11 - 09				209	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 11 - 10				226	≥ 10	≥ 50	FTB	SE-1	PASS
				220	≥ 10	≥ 50	FTB	SE-1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 146  
Average of Peel Test Values, Outside Track (ppi) (2) 150  
Average of Shear Test Values (ppi) 220

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 12  
SEAM BETWEEN PANELS NO.: P- 7-7 / P- 7-8  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 179  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DAMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 12 - 01	125	131	X	≤ 10	X	FTB	SE-1	PASS	
DS- 12 - 02	136	153		≤ 10		FTB	SE-1	PASS	
DS- 12 - 03	160	181		≤ 10		FTB	SE-1	PASS	
DS- 12 - 04	145	183		≤ 10		FTB	SE-1	PASS	
DS- 12 - 05	155	142		≤ 10		FTB	SE-1	PASS	
DS- 12 - 06	X	X	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 12 - 07				153	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 12 - 08				141	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 12 - 09				235	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 12 - 10				231	≥ 10	≥ 50	FTB	SE-1	PASS
				230	≥ 10	≥ 50	FTB	SE-1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 144  
Average of Peel Test Values, Outside Track (ppi) (2) 158  
Average of Shear Test Values (ppi) 198

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 13  
SEAM BETWEEN PANELS NO.: P-S-22 / P-S-24  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 135  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>13</u> -01	154	148	X	≤ 10	X	FTB	SE-1	PASS	
DS- <u>13</u> -02	141	143		≤ 10		FTB	SE-1	PASS	
DS- <u>13</u> -03	153	156		≤ 10		FTB	SE-1	PASS	
DS- <u>13</u> -04	143	151		≤ 10		FTB	SE-1	PASS	
DS- <u>13</u> -05	127	151		≤ 10		FTB	SE-1	PASS	
DS- <u>13</u> -06	X	214	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- <u>13</u> -07		223		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- <u>13</u> -08		172		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- <u>13</u> -09		172		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- <u>13</u> -10		211		≥ 10	≥ 50	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 144  
Average of Peel Test Values, Outside Track (ppi) (2) 150  
Average of Shear Test Values (ppi) 198

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 14  
SEAM BETWEEN PANELS NO.: P-S-24/ P-S-26  
DESTRUCTIVE SAMPLE LOCATION: STA. 2 + 45 to STA. 2 + 50  
REPAIR NO.: R- 133  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DAMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 14 -01	137	160	X	≤ 10	X	FTB	SE-1	PASS	
DS- 14 -02	134	173		≤ 10		FTB	SE-1	PASS	
DS- 14 -03	137	162		≤ 10		FTB	SE-1	PASS	
DS- 14 -04	142	147		≤ 10		FTB	SE-1	PASS	
DS- 14 -05	138	162		≤ 10		FTB	SE-1	PASS	
DS- 14 -06	X	205	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 14 -07		197		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 14 -08		212		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 14 -09		200		≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 14 -10		203		≥ 10	≥ 50	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 138  
Average of Peel Test Values, Outside Track (ppi) (2) 161  
Average of Shear Test Values (ppi) 203

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 15  
SEAM BETWEEN PANELS NO.: P-S-25 / P-S-27  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 386  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 15 -01	141	145	X	≤ 10	X	FTB	SE-1	PASS	
DS- 15 -02	143	143		≤ 10		FTB	SE-1	PASS	
DS- 15 -03	144	143		≤ 10		FTB	SE-1	PASS	
DS- 15 -04	137	149		≤ 10		FTB	SE-1	PASS	
DS- 15 -05	146	157		≤ 10		FTB	SE-1	PASS	
DS- 15 -06	X	X	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 15 -07				189	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 15 -08				195	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 15 -09				205	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 15 -10				211	≥ 10	≥ 50	FTB	SE-1	PASS
		201		≥ 10	≥ 50	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 142  
Average of Peel Test Values, Outside Track (ppi) (2) 147  
Average of Shear Test Values (ppi) 200

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 16  
SEAM BETWEEN PANELS NO.: P-S-29 / P-S-30  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 10 to STA. 0 + 15  
REPAIR NO.: R- 112  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTRETT  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- 16 -01	122	119	X	≤ 10	X	X	FTB	SE-1	PASS
DS- 16 -02	132	123		≤ 10			FTB	SE-1	PASS
DS- 16 -03	160	132		≤ 10			FTB	SE-1	PASS
DS- 16 -04	130	141		≤ 10			FTB	SE-1	PASS
DS- 16 -05	115	131		≤ 10			FTB	SE-1	PASS
DS- 16 -06	X	X	166	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 16 -07			162	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 16 -08			174	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 16 -09			175	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 16 -10			174	≥ 10	≥ 50	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 132  
Average of Peel Test Values, Outside Track (ppi) (2) 129  
Average of Shear Test Values (ppi) 170

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 17  
SEAM BETWEEN PANELS NO.: P-5-29 / P-5-31  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 116  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DANTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- 17 - 01	142	151	X	≤ 10	X	FTB	SE-1	PASS	
DS- 17 - 02	132	140		≤ 10		FTB	SE-1	PASS	
DS- 17 - 03	158	139		≤ 10		FTB	SE-1	PASS	
DS- 17 - 04	156	149		≤ 10		FTB	SE-1	PASS	
DS- 17 - 05	137	146		≤ 10		FTB	SE-1	PASS	
DS- 17 - 06	X	X	X	≥ 10	≥ 50	FTB	SE-1	PASS	
DS- 17 - 07				219	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 17 - 08				225	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 17 - 09				224	≥ 10	≥ 50	FTB	SE-1	PASS
DS- 17 - 10				223	≥ 10	≥ 50	FTB	SE-1	PASS
		260		≥ 10	≥ 50	FTB	SE-1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 145  
Average of Peel Test Values, Outside Track (ppi) (2) 145  
Average of Shear Test Values (ppi) 230

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 18  
SEAM BETWEEN PANELS NO.: P-S-31 / P-S-33  
DESTRUCTIVE SAMPLE LOCATION: STA. 2 + 53 to STA. 2 + 58  
REPAIR NO.: R- 209  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: Demtek  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- 18 -01	135	169	X	≤ 10	X	FTB	SEI	PASS	
DS- 18 -02	132	158		≤ 10		FTB	SEI	PASS	
DS- 18 -03	137	172		≤ 10		FTB	SEI	PASS	
DS- 18 -04	134	134		≤ 10		FTB	SEI	PASS	
DS- 18 -05	144	122		≤ 10		FTB	SEI	PASS	
DS- 18 -06	X	X	X	≥ 10	≥ 50	FTB	SEI	PASS	
DS- 18 -07				204	≥ 10	≥ 50	FTB	SEI	PASS
DS- 18 -08				209	≥ 10	≥ 50	FTB	SEI	PASS
DS- 18 -09				198	≥ 10	≥ 50	FTB	SEI	PASS
DS- 18 -10				214	≥ 10	≥ 50	FTB	SEI	PASS
				210	≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 136  
Average of Peel Test Values, Outside Track (ppi) (2) 151  
Average of Shear Test Values (ppi) 207

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 19  
SEAM BETWEEN PANELS NO.: P-S-33 / P-S-34  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 108  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>19</u> -01	<u>158</u>	<u>166</u>	X	$\leq 10$	X	FTB	SE1	PASS
DS- <u>19</u> -02	<u>154</u>	<u>155</u>		$\leq 10$		FTB	SE1	PASS
DS- <u>19</u> -03	<u>163</u>	<u>143</u>		$\leq 10$		FTB	SE1	PASS
DS- <u>19</u> -04	<u>158</u>	<u>150</u>		$\leq 10$		FTB	SE1	PASS
DS- <u>19</u> -05	<u>154</u>	<u>160</u>		$\leq 10$		FTB	SE1	PASS
DS- <u>19</u> -06	X	<u>185</u>	X	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>19</u> -07		<u>189</u>		$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>19</u> -08		<u>187</u>		$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>19</u> -09		<u>187</u>		$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>19</u> -10		<u>186</u>		$\geq 10$	$\geq 50$	FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 157  
Average of Peel Test Values, Outside Track (ppi) (2) 155  
Average of Shear Test Values (ppi) 187

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 20  
SEAM BETWEEN PANELS NO.: P-S-34/ P-S-36  
DESTRUCTIVE SAMPLE LOCATION: STA. 2 + 20 to STA. 2 + 25  
REPAIR NO.: R- 117  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: Demtek  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>20</u> - 01	<u>122</u>	<u>122</u>	X	<u>≤ 10</u>	X	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 02	<u>132</u>	<u>122</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 03	<u>137</u>	<u>128</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 04	<u>129</u>	<u>122</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 05	<u>136</u>	<u>135</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 06	X	X	<u>199</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 07			<u>198</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 08			<u>191</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 09			<u>190</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>20</u> - 10			<u>178</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 131  
Average of Peel Test Values, Outside Track (ppi) (2) 126  
Average of Shear Test Values (ppi) 191

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 21  
SEAM BETWEEN PANELS NO.: P-T-20 / P-T-21  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 20 to STA. 0 + 25  
REPAIR NO.: R- 184  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-11-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: Demtek  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- 21 - 01	131	130	X	≤ 10	X	FTB	SE1	PASS	
DS- 21 - 02	135	112		≤ 10		FTB	SE1	PASS	
DS- 21 - 03	125	129		≤ 10		FTB	SE1	PASS	
DS- 21 - 04	138	153		≤ 10		FTB	SE1	PASS	
DS- 21 - 05	137	139		≤ 10		FTB	SE1	PASS	
DS- 21 - 06	X	X	X	≥ 10	≥ 50	FTB	SE1	PASS	
DS- 21 - 07				201	≥ 10	≥ 50	FTB	SE1	PASS
DS- 21 - 08				205	≥ 10	≥ 50	FTB	SE1	PASS
DS- 21 - 09				204	≥ 10	≥ 50	FTB	SE1	PASS
DS- 21 - 10				207	≥ 10	≥ 50	FTB	SE1	PASS
		191		≥ 10	≥ 50	FTB	SE1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 133  
Average of Peel Test Values, Outside Track (ppi) (2) 133  
Average of Shear Test Values (ppi) 202

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 22  
SEAM BETWEEN PANELS NO.: P-7-27/ P-7-28  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 428  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>22</u> - 01	<u>112</u>	<u>117</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>22</u> - 02	<u>121</u>	<u>135</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>22</u> - 03	<u>125</u>	<u>122</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>22</u> - 04	<u>126</u>	<u>121</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>22</u> - 05	<u>108</u>	<u>120</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>22</u> - 06	X	X	X	<u>196</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>22</u> - 07				<u>191</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>22</u> - 08				<u>195</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>22</u> - 09				<u>202</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>22</u> - 10				<u>200</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 112  
Average of Peel Test Values, Outside Track (ppi) (2) 123  
Average of Shear Test Values (ppi) 197

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 23  
SEAM BETWEEN PANELS NO.: P-737/ P-738  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 20 to STA. 0 + 25  
REPAIR NO.: R- 459  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: Dem Tech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
D S- <u>23</u> - 01	<u>129</u>	<u>128</u>	X	$\leq 10$	X	FTB	SE1	PASS	
D S- <u>23</u> - 02	<u>123</u>	<u>128</u>		$\leq 10$		FTB	SE1	PASS	
D S- <u>23</u> - 03	<u>132</u>	<u>151</u>		$\leq 10$		FTB	SE1	PASS	
D S- <u>23</u> - 04	<u>129</u>	<u>118</u>		$\leq 10$		FTB	SE1	PASS	
D S- <u>23</u> - 05	<u>153</u>	<u>139</u>		$\leq 10$		FTB	SE1	PASS	
D S- <u>23</u> - 06	X	X	X	$\geq 10$	$\geq 50$	FTB	SE1	PASS	
D S- <u>23</u> - 07				<u>170</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
D S- <u>23</u> - 08				<u>212</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
D S- <u>23</u> - 09				<u>195</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
D S- <u>23</u> - 10				<u>206</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
		<u>220</u>		$\geq 10$	$\geq 50$	FTB	SE1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 133  
Average of Peel Test Values, Outside Track (ppi) (2) 133  
Average of Shear Test Values (ppi) 201

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 24  
SEAM BETWEEN PANELS NO.: P-537 / P-8-38  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 70 to STA. 0 + 75  
REPAIR NO.: R- 120  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS-24-01	145	174	≤ 10			FTB	SE1	PASS
DS-24-02	146	143	≤ 10			FTB	SE1	PASS
DS-24-03	132	113	≤ 10			FTB	SE1	PASS
DS-24-04	130	158	≤ 10			FTB	SE1	PASS
DS-24-05	138	151	≤ 10			FTB	SE1	PASS
DS-24-06				≥ 10	≥ 50	FTB	SE1	PASS
DS-24-07				≥ 10	≥ 50	FTB	SE1	PASS
DS-24-08				≥ 10	≥ 50	FTB	SE1	PASS
DS-24-09				≥ 10	≥ 50	FTB	SE1	PASS
DS-24-10				≥ 10	≥ 50	FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 138  
Average of Peel Test Values, Outside Track (ppi) (2) 148  
Average of Shear Test Values (ppi) 216

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 25  
SEAM BETWEEN PANELS NO.: P-5-411 P-5-42  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 77  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL		
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK	
	Inside Track	Outside Track								
DS- 25 - 01	138	170	X	≤ 10	X	FTB	SEI	PASS		
DS- 25 - 02	133	160		≤ 10		FTB	SEI	PASS		
DS- 25 - 03	134	156		≤ 10		FTB	SEI	PASS		
DS- 25 - 04	151	158		≤ 10		FTB	SEI	PASS		
DS- 25 - 05	139	158		≤ 10		FTB	SEI	PASS		
DS- 25 - 06	X	X	X	≥ 10	≥ 50	FTB	SEI	PASS		
DS- 25 - 07				206	208	≥ 10	≥ 50	FTB	SEI	PASS
DS- 25 - 08				206	206	≥ 10	≥ 50	FTB	SEI	PASS
DS- 25 - 09				212	208	≥ 10	≥ 50	FTB	SEI	PASS
DS- 25 - 10				208	208	≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 139  
Average of Peel Test Values, Outside Track (ppi) (2) 160  
Average of Shear Test Values (ppi) 208

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 26  
SEAM BETWEEN PANELS NO.: P-542 / P-544  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 47 to STA. 0 + 52  
REPAIR NO.: R- 79  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- 26 - 01	150	131	X	≤ 10	X	FTB	SEI	PASS	
DS- 26 - 02	153	131		≤ 10		FTB	SEI	PASS	
DS- 26 - 03	146	122		≤ 10		FTB	SEI	PASS	
DS- 26 - 04	133	134		≤ 10		FTB	SEI	PASS	
DS- 26 - 05	131	130		≤ 10		FTB	SEI	PASS	
DS- 26 - 06	X	X	X	201	≥ 10	≥ 50	FTB	SEI	PASS
DS- 26 - 07				202	≥ 10	≥ 50	FTB	SEI	PASS
DS- 26 - 08				209	≥ 10	≥ 50	FTB	SEI	PASS
DS- 26 - 09				220	≥ 10	≥ 50	FTB	SEI	PASS
DS- 26 - 10				203	≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 143  
Average of Peel Test Values, Outside Track (ppi) (2) 130  
Average of Shear Test Values (ppi) 207

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 27  
SEAM BETWEEN PANELS NO.: P-S-44 / P-S-46  
DESTRUCTIVE SAMPLE LOCATION: STA. 3 + 32 to STA. 3 + 37  
REPAIR NO.: R- 74  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 27 - 01	139	171	≤ 10	X	X	FTB	SEI	PASS
DS- 27 - 02	126	159				FTB	SEI	PASS
DS- 27 - 03	122	156				FTB	SEI	PASS
DS- 27 - 04	123	160				FTB	SEI	PASS
DS- 27 - 05	136	158				FTB	SEI	PASS
DS- 27 - 06	X	209	X	≥ 10	≥ 50	FTB	SEI	PASS
DS- 27 - 07		227		≥ 10	≥ 50	FTB	SEI	PASS
DS- 27 - 08		211		≥ 10	≥ 50	FTB	SEI	PASS
DS- 27 - 09		227		≥ 10	≥ 50	FTB	SEI	PASS
DS- 27 - 10		217		≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 129  
Average of Peel Test Values, Outside Track (ppi) (2) 161  
Average of Shear Test Values (ppi) 218

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 28  
SEAM BETWEEN PANELS NO.: P-S-46 / P-S-48  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 37 to STA. 0 + 42  
REPAIR NO.: R- 216  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08

TENSIOMETER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS-28-01	143	167	X	≤ 10	X	FTB	SEI	PASS
DS-28-02	155	162		≤ 10		FTB	SEI	PASS
DS-28-03	158	152		≤ 10		FTB	SEI	PASS
DS-28-04	160	163		≤ 10		FTB	SEI	PASS
DS-28-05	139	159		≤ 10		FTB	SEI	PASS
DS-28-06	X	210	X	≥ 10	≥ 50	FTB	SEI	PASS
DS-28-07		216		≥ 10	≥ 50	FTB	SEI	PASS
DS-28-08		211		≥ 10	≥ 50	FTB	SEI	PASS
DS-28-09		200		≥ 10	≥ 50	FTB	SEI	PASS
DS-28-10		203		≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 157  
Average of Peel Test Values, Outside Track (ppi) (2) 161  
Average of Shear Test Values (ppi) 208

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 29  
SEAM BETWEEN PANELS NO.: P-5-36 / P-5-37  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 110  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08

TENSIOMETER TYPE / BRAND: DEWTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 29 - 01	146	120	≤ 10	X	X	FTB	SEI	PASS
DS- 29 - 02	137	156	≤ 10			FTB	SEI	PASS
DS- 29 - 03	140	156	≤ 10			FTB	SEI	PASS
DS- 29 - 04	138	153	≤ 10			FTB	SEI	PASS
DS- 29 - 05	130	149	≤ 10			FTB	SEI	PASS
DS- 29 - 06	X	X	211	≥ 10	≥ 50	FTB	SEI	PASS
DS- 29 - 07			222	≥ 10	≥ 50	FTB	SEI	PASS
DS- 29 - 08			209	≥ 10	≥ 50	FTB	SEI	PASS
DS- 29 - 09			219	≥ 10	≥ 50	FTB	SEI	PASS
DS- 29 - 10			204	≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 138  
Average of Peel Test Values, Outside Track (ppi) (2) 147  
Average of Shear Test Values (ppi) 213

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 30  
SEAM BETWEEN PANELS NO.: P-S-50 / P-S-51  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 70 to STA. 0 + 75  
REPAIR NO.: R- 60  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- 30 - 01	141	148	X	≤ 10	X	X	FTB	SEI	PASS
DS- 30 - 02	137	149		≤ 10			FTB	SEI	PASS
DS- 30 - 03	137	149		≤ 10			FTB	SEI	PASS
DS- 30 - 04	145	129		≤ 10			FTB	SEI	PASS
DS- 30 - 05	140	136		≤ 10			FTB	SEI	PASS
DS- 30 - 06	X	X	207	≥ 10	≥ 50	FTB	SEI	PASS	
DS- 30 - 07			218	≥ 10	≥ 50	FTB	SEI	PASS	
DS- 30 - 08			201	≥ 10	≥ 50	FTB	SEI	PASS	
DS- 30 - 09			213	≥ 10	≥ 50	FTB	SEI	PASS	
DS- 30 - 10			222	≥ 10	≥ 50	FTB	SEI	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 140  
Average of Peel Test Values, Outside Track (ppi) (2) 142  
Average of Shear Test Values (ppi) 232

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 31  
SEAM BETWEEN PANELS NO.: P-5-51 / P-5-53  
DESTRUCTIVE SAMPLE LOCATION: STA. 2 + 20 to STA. 2 + 25  
REPAIR NO.: R- 25  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DENTERIT  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>31</u> - 01	<u>121</u>	<u>133</u>	X	$\leq 10$	X	FTB	SEI	PASS
DS- <u>31</u> - 02	<u>140</u>	<u>140</u>		$\leq 10$		FTB	SEI	PASS
DS- <u>31</u> - 03	<u>141</u>	<u>123</u>		$\leq 10$		FTB	SEI	PASS
DS- <u>31</u> - 04	<u>146</u>	<u>143</u>		$\leq 10$		FTB	SEI	PASS
DS- <u>31</u> - 05	<u>133</u>	<u>135</u>		$\leq 10$		FTB	SEI	PASS
DS- <u>31</u> - 06	X	<u>216</u>	X	$\geq 10$	$\geq 50$	FTB	SEI	PASS
DS- <u>31</u> - 07		<u>215</u>		$\geq 10$	$\geq 50$	FTB	SEI	PASS
DS- <u>31</u> - 08		<u>198</u>		$\geq 10$	$\geq 50$	FTB	SEI	PASS
DS- <u>31</u> - 09		<u>213</u>		$\geq 10$	$\geq 50$	FTB	SEI	PASS
DS- <u>31</u> - 10		<u>214</u>		$\geq 10$	$\geq 50$	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 136  
Average of Peel Test Values, Outside Track (ppi) (2) 135  
Average of Shear Test Values (ppi) 211

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 32  
SEAM BETWEEN PANELS NO.: P-F16 / P-S-24  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 10 to STA. 0 + 15  
REPAIR NO.: R- 137  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-12-08  
TESTING DATE: 3-15-08

TENSIOMETER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 32 - 01	145	154	≤ 10	≥ 10	≥ 50	FTB	SE1	PASS
DS- 32 - 02	142	150				FTB	SE1	PASS
DS- 32 - 03	146	150				FTB	SE1	PASS
DS- 32 - 04	138	140				FTB	SE1	PASS
DS- 32 - 05	142	151				FTB	SE1	PASS
DS- 32 - 06	X	183	X	≥ 10	≥ 50	FTB	SE1	PASS
DS- 32 - 07		163		≥ 10	≥ 50	FTB	SE1	PASS
DS- 32 - 08		189		≥ 10	≥ 50	FTB	SE1	PASS
DS- 32 - 09		180		≥ 10	≥ 50	FTB	SE1	PASS
DS- 32 - 10		175		≥ 10	≥ 50	FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 143  
Average of Peel Test Values, Outside Track (ppi) (2) 149  
Average of Shear Test Values (ppi) 178

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 33  
SEAM BETWEEN PANELS NO.: P-T-42 / P-T-43  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 70 to STA. 0 + 75  
REPAIR NO.: R- 96  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 33 - 01	135	145	X	≤ 10	X	FTB	SE1	PASS
DS- 33 - 02	134	153		≤ 10		FTB	SE1	PASS
DS- 33 - 03	150	132		≤ 10		FTB	SE1	PASS
DS- 33 - 04	127	158		≤ 10		FTB	SE1	PASS
DS- 33 - 05	165	149		≤ 10		FTB	SE1	PASS
DS- 33 - 06	X	219	X	≥ 10	≥ 50	FTB	SE1	PASS
DS- 33 - 07		197		≥ 10	≥ 50	FTB	SE1	PASS
DS- 33 - 08		212		≥ 10	≥ 50	FTB	SE1	PASS
DS- 33 - 09		214		≥ 10	≥ 50	FTB	SE1	PASS
DS- 33 - 10		215		≥ 10	≥ 50	FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 142  
Average of Peel Test Values, Outside Track (ppi) (2) 147  
Average of Shear Test Values (ppi) 211

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 34  
SEAM BETWEEN PANELS NO.: P-J-47 / P-J-48  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 195  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>34</u> - 01	<u>132</u>	<u>151</u>	X	$\leq 10$	X	FTB	SE1	PASS	
DS- <u>34</u> - 02	<u>135</u>	<u>131</u>		$\leq 10$		FTB	SE1	PASS	
DS- <u>34</u> - 03	<u>135</u>	<u>135</u>		$\leq 10$		FTB	SE1	PASS	
DS- <u>34</u> - 04	<u>134</u>	<u>143</u>		$\leq 10$		FTB	SE1	PASS	
DS- <u>34</u> - 05	<u>150</u>	<u>154</u>		$\leq 10$		FTB	SE1	PASS	
DS- <u>34</u> - 06	X	X	X	$\geq 10$	$\geq 50$	FTB	SE1	PASS	
DS- <u>34</u> - 07				<u>223</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>34</u> - 08				<u>224</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>34</u> - 09				<u>207</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>34</u> - 10				<u>222</u>	$\geq 10$	$\geq 50$	FTB	SE1	PASS
		<u>217</u>		$\geq 10$	$\geq 50$	FTB	SE1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 137  
Average of Peel Test Values, Outside Track (ppi) (2) 143  
Average of Shear Test Values (ppi) 219

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 35  
SEAM BETWEEN PANELS NO.: P-7-52 / P-7-54  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 10 to STA. 0 + 15  
REPAIR NO.: R- 199  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: Dem Tech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 35 - 01	166	154	≤ 10			FTB	SE1	PASS
DS- 35 - 02	144	145	≤ 10			FTB	SE1	PASS
DS- 35 - 03	156	144	≤ 10			FTB	SE1	PASS
DS- 35 - 04	142	139	≤ 10			FTB	SE1	PASS
DS- 35 - 05	138	145	≤ 10			FTB	SE1	PASS
DS- 35 - 06		192		≥ 10	≥ 50	FTB	SE1	PASS
DS- 35 - 07		154		≥ 10	≥ 50	FTB	SE1	PASS
DS- 35 - 08		182		≥ 10	≥ 50	FTB	SE1	PASS
DS- 35 - 09		186		≥ 10	≥ 50	FTB	SE1	PASS
DS- 35 - 10		185		≥ 10	≥ 50	FTB	SE1	PASS

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 149  
Average of Peel Test Values, Outside Track (ppi) (2) 145  
Average of Shear Test Values (ppi) 180

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 36  
SEAM BETWEEN PANELS NO.: P-T-57 / P-T-58  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 70 to STA. 0 + 75  
REPAIR NO.: R- 206  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTERTH  
SERIAL NUMBER: 256380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>36</u> -01	124	150	X	≤ 10	X	FTB	SEI	PASS
DS- <u>36</u> -02	124	134		≤ 10		FTB	SEI	PASS
DS- <u>36</u> -03	127	136		≤ 10		FTB	SEI	PASS
DS- <u>36</u> -04	129	142		≤ 10		FTB	SEI	PASS
DS- <u>36</u> -05	133	144		≤ 10		FTB	SEI	PASS
DS- <u>36</u> -06	X	209	X	≥ 10	≥ 50	FTB	SEI	PASS
DS- <u>36</u> -07		222		≥ 10	≥ 50	FTB	SEI	PASS
DS- <u>36</u> -08		217		≥ 10	≥ 50	FTB	SEI	PASS
DS- <u>36</u> -09		221		≥ 10	≥ 50	FTB	SEI	PASS
DS- <u>36</u> -10		220		≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 127  
Average of Peel Test Values, Outside Track (ppi) (2) 141  
Average of Shear Test Values (ppi) 218

CQA TECHNICIAN: [Signature]  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 37  
SEAM BETWEEN PANELS NO.: P-7-61 / P-7-62  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 20 to STA. 0 + 25  
REPAIR NO.: R- 207  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 37 - 01	142	141	X	≤ 10	X	FTB	SEI	PASS	
DS- 37 - 02	143	166		≤ 10		FTB	SEI	PASS	
DS- 37 - 03	161	152		≤ 10		FTB	SEI	PASS	
DS- 37 - 04	121	132		≤ 10		FTB	SEI	PASS	
DS- 37 - 05	121	149		≤ 10		FTB	SEI	PASS	
DS- 37 - 06	X	X	X	≥ 10	≥ 50	FTB	SEI	PASS	
DS- 37 - 07				214	≥ 10	≥ 50	FTB	SEI	PASS
DS- 37 - 08				210	≥ 10	≥ 50	FTB	SEI	PASS
DS- 37 - 09				220	≥ 10	≥ 50	FTB	SEI	PASS
DS- 37 - 10				201	≥ 10	≥ 50	FTB	SEI	PASS
				208	≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 138  
Average of Peel Test Values, Outside Track (ppi) (2) 148  
Average of Shear Test Values (ppi) 211

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 38  
SEAM BETWEEN PANELS NO.: P-7-66 / P-7-67  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 208  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 38 -01	114	147	≤ 10	X	X	FTB	SEI	PASS
DS- 38 -02	128	143				FTB	SEI	PASS
DS- 38 -03	128	138				FTB	SEI	PASS
DS- 38 -04	117	135				FTB	SEI	PASS
DS- 38 -05	125	132				FTB	SEI	PASS
DS- 38 -06	X	189	X	≥ 10	≥ 50	FTB	SEI	PASS
DS- 38 -07		210		≥ 10	≥ 50	FTB	SEI	PASS
DS- 38 -08		199		≥ 10	≥ 50	FTB	SEI	PASS
DS- 38 -09		207		≥ 10	≥ 50	FTB	SEI	PASS
DS- 38 -10		209		≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 122  
Average of Peel Test Values, Outside Track (ppi) (2) 139  
Average of Shear Test Values (ppi) 203

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 39  
SEAM BETWEEN PANELS NO.: P-745 / PS-44  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 15 to STA. 0 + 20  
REPAIR NO.: R- 187  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DANTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS-39-01	153	135	X	≤ 10	X	X	FTB	SE1	PASS
DS-39-02	121	126		≤ 10			FTB	SE1	PASS
DS-39-03	145	137		≤ 10			FTB	SE1	PASS
DS-39-04	141	135		≤ 10			FTB	SE1	PASS
DS-39-05	138	134		≤ 10			FTB	SE1	PASS
DS-39-06	X	X	181	≥ 10	≥ 50	FTB	SE1	PASS	
DS-39-07			193	≥ 10	≥ 50	FTB	SE1	PASS	
DS-39-08			190	≥ 10	≥ 50	FTB	SE1	PASS	
DS-39-09			186	≥ 10	≥ 50	FTB	SE1	PASS	
DS-39-10			187	≥ 10	≥ 50	FTB	SE1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 140  
Average of Peel Test Values, Outside Track (ppi) (2) 133  
Average of Shear Test Values (ppi) 187

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 40  
SEAM BETWEEN PANELS NO.: P-S-541 P-S-546  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 20 to STA. 0 + 25  
REPAIR NO.: R- 22  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-13-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- 40 -01	154	164	≤ 10			FTB	SEI	PASS
DS- 40 -02	149	162	≤ 10			FTB	SEI	PASS
DS- 40 -03	159	146	≤ 10			FTB	SEI	PASS
DS- 40 -04	150	147	≤ 10			FTB	SEI	PASS
DS- 40 -05	130	140	≤ 10			FTB	SEI	PASS
DS- 40 -06		200		≥ 10	≥ 50	FTB	SEI	PASS
DS- 40 -07		201		≥ 10	≥ 50	FTB	SEI	PASS
DS- 40 -08		210		≥ 10	≥ 50	FTB	SEI	PASS
DS- 40 -09		226		≥ 10	≥ 50	FTB	SEI	PASS
DS- 40 -10		218		≥ 10	≥ 50	FTB	SEI	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 148  
Average of Peel Test Values, Outside Track (ppi) (2) 157  
Average of Shear Test Values (ppi) 211

CQA TECHNICIAN: [Signature]  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 41  
SEAM BETWEEN PANELS NO.: P-7-73 / P-7-74  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 75 to STA. 0 + 80  
REPAIR NO.: R- 2  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-14-08  
TESTING DATE: 3-15-08  
TENSIO METER TYPE / BRAND: DANTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>41</u> -01	<u>143</u>	<u>137</u>	$\leq 10$	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>41</u> -02	<u>130</u>	<u>133</u>				FTB	SE1	PASS
DS- <u>41</u> -03	<u>159</u>	<u>147</u>				FTB	SE1	PASS
DS- <u>41</u> -04	<u>148</u>	<u>142</u>				FTB	SE1	PASS
DS- <u>41</u> -05	<u>147</u>	<u>153</u>				FTB	SE1	PASS
DS- <u>41</u> -06	$\geq 10$	$\geq 50$	$\geq 10$	$\geq 50$	$\geq 50$	FTB	SE1	PASS
DS- <u>41</u> -07						FTB	SE1	PASS
DS- <u>41</u> -08						FTB	SE1	PASS
DS- <u>41</u> -09						FTB	SE1	PASS
DS- <u>41</u> -10						FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 145  
Average of Peel Test Values, Outside Track (ppi) (2) 142  
Average of Shear Test Values (ppi) 216

CQA TECHNICIAN: TAA  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 42  
SEAM BETWEEN PANELS NO.: P-T-76 / P-T-77  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 50 to STA. 0 + 55  
REPAIR NO.: R- 1  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-14-08  
TESTING DATE: 3-17-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>42</u> - 01	<u>192</u>	<u>155</u>	$\leq 10$	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>42</u> - 02	<u>176</u>	<u>143</u>				FTB	SE1	PASS
DS- <u>42</u> - 03	<u>149</u>	<u>160</u>				FTB	SE1	PASS
DS- <u>42</u> - 04	<u>148</u>	<u>171</u>				FTB	SE1	PASS
DS- <u>42</u> - 05	<u>183</u>	<u>162</u>				FTB	SE1	PASS
DS- <u>42</u> - 06	$\geq 10$	$\geq 50$	$\geq 10$	$\geq 50$	$\geq 50$	FTB	SE1	PASS
DS- <u>42</u> - 07						FTB	SE1	PASS
DS- <u>42</u> - 08						FTB	SE1	PASS
DS- <u>42</u> - 09						FTB	SE1	PASS
DS- <u>42</u> - 10						FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 170  
Average of Peel Test Values, Outside Track (ppi) (2) 158  
Average of Shear Test Values (ppi) 266

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 43  
SEAM BETWEEN PANELS NO.: P-768 / P-S-55  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 15 to STA. 0 + 20  
REPAIR NO.: R- 27  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-14-08  
TESTING DATE: 3-17-08

TENSIOMETER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>43</u> -01	<u>138</u>	<u>185</u>	$\leq 10$	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>43</u> -02	<u>159</u>	<u>141</u>				FTB	SE1	PASS
DS- <u>43</u> -03	<u>127</u>	<u>203</u>				FTB	SE1	PASS
DS- <u>43</u> -04	<u>189</u>	<u>145</u>				FTB	SE1	PASS
DS- <u>43</u> -05	<u>151</u>	<u>184</u>				FTB	SE1	PASS
DS- <u>43</u> -06	$\geq 10$	$\geq 50$	$\geq 10$	$\geq 50$	$\geq 50$	FTB	SE1	PASS
DS- <u>43</u> -07						FTB	SE1	PASS
DS- <u>43</u> -08						FTB	SE1	PASS
DS- <u>43</u> -09						FTB	SE1	PASS
DS- <u>43</u> -10						FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 153  
Average of Peel Test Values, Outside Track (ppi) (2) 172  
Average of Shear Test Values (ppi) 242

CQA TECHNICIAN: [Signature]  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 44  
SEAM BETWEEN PANELS NO.: P-7-83 / P-7-86  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 45 to STA. 0 + 50  
REPAIR NO.: R- 473  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-14-08  
TESTING DATE: 3-17-08  
TENSIO METER TYPE / BRAND: Demtek  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL
	PEEL TEST <sup>(2)</sup>				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>44</u> -01	<u>154</u>	<u>146</u>	X	$\leq 10$	X	X	FTB	SE1	PASS
DS- <u>44</u> -02	<u>190</u>	<u>156</u>		$\leq 10$			FTB	SE1	PASS
DS- <u>44</u> -03	<u>164</u>	<u>162</u>		$\leq 10$			FTB	SE1	PASS
DS- <u>44</u> -04	<u>166</u>	<u>139</u>		$\leq 10$			FTB	SE1	PASS
DS- <u>44</u> -05	<u>188</u>	<u>155</u>		$\leq 10$			FTB	SE1	PASS
DS- <u>44</u> -06	X	X	X		$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>44</u> -07				277	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>44</u> -08				285	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>44</u> -09				222	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>44</u> -10				284	$\geq 10$	$\geq 50$	FTB	SE1	PASS
DS- <u>44</u> -10				281	$\geq 10$	$\geq 50$	FTB	SE1	PASS

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 172  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 152  
Average of Shear Test Values (ppi) 270

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 45  
SEAM BETWEEN PANELS NO.: P- F39 P-5-49  
DESTRUCTIVE SAMPLE LOCATION: STA. 0+12 to STA. 0+16  
REPAIR NO.: R- 45  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-14-08  
TESTING DATE: 3-18-08  
TENSIO METER TYPE / BRAND: DENTELH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>45</u> -01	<u>142</u>	<u>107</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -02	<u>125</u>	<u>147</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -03	<u>173</u>	<u>141</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -04	<u>104</u>	<u>133</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -05	<u>132</u>	<u>160</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -06	X	<u>229</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -07		<u>242</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -08		<u>231</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -09		<u>247</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>45</u> -10		<u>230</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 135  
Average of Peel Test Values, Outside Track (ppi) (2) 137  
Average of Shear Test Values (ppi) 235

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 46  
SEAM BETWEEN PANELS NO.: P-7831 & R-8  
DESTRUCTIVE SAMPLE LOCATION: STA. - + - to STA. - + -  
REPAIR NO.: R- 7  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-17-08  
TESTING DATE: 3-18-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL
	PEEL TEST <sup>(2)</sup>				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>46</u> -01	<u>118</u>	<u>-</u>	X	<u>≤ 10</u>	X	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -02	<u>136</u>	<u>-</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -03	<u>130</u>	<u>-</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -04	<u>94</u>	<u>-</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -05	<u>100</u>	<u>-</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -06	X	X	<u>180</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -07			<u>180</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -08			<u>179</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -09			<u>187</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>46</u> -10			<u>178</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 115  
Average of Peel Test Values, Outside Track (ppi) -  
Average of Shear Test Values (ppi) 180

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 47  
SEAM BETWEEN PANELS NO.: R-5-14, R-C-11  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 10 to STA. 0 + 14  
REPAIR NO.: R- 365  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-17-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DamTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>47</u> -01	<u>136</u>	<u>151</u>	X	<u>≤ 10</u>	X	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -02	<u>137</u>	<u>144</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -03	<u>128</u>	<u>147</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -04	<u>148</u>	<u>144</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -05	<u>133</u>	<u>162</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -06	X	X	<u>150</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -07			<u>198</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -08			<u>161</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -09			<u>200</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>47</u> -10			<u>193</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 136  
Average of Peel Test Values, Outside Track (ppi) (2) 149  
Average of Shear Test Values (ppi) 180

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 48  
SEAM BETWEEN PANELS NO.: R-26/ R-11  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 10 to STA. 0 + 15  
REPAIR NO.: R- 420  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-19-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>48</u> -01	151	131	X	≤ 10	X	X	FTB	SE1	PASS
DS- <u>48</u> -02	144	150		≤ 10			FTB	SE1	PASS
DS- <u>48</u> -03	121	130		≤ 10			FTB	SE1	PASS
DS- <u>48</u> -04	127	151		≤ 10			FTB	SE1	PASS
DS- <u>48</u> -05	126	146		≤ 10			FTB	SE1	PASS
DS- <u>48</u> -06	X	X	186	≥ 10	≥ 50	FTB	SE1	PASS	
DS- <u>48</u> -07			191	≥ 10	≥ 50	FTB	SE1	PASS	
DS- <u>48</u> -08			203	≥ 10	≥ 50	FTB	SE1	PASS	
DS- <u>48</u> -09			198	≥ 10	≥ 50	FTB	SE1	PASS	
DS- <u>48</u> -10			199	≥ 10	≥ 50	FTB	SE1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 133  
Average of Peel Test Values, Outside Track (ppi) (2) 141  
Average of Shear Test Values (ppi) 195

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 05-49  
SEAM BETWEEN PANELS NO.: P-5-63/ P-5-64  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 75 to STA. 0 + 80  
REPAIR NO.: R- 224  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-19-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DENTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

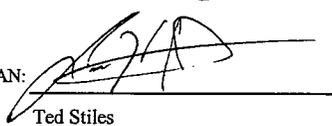
QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- <u>49-01</u>	<u>155</u>	<u>163</u>	X	<u>≤ 10</u>	X	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-02</u>	<u>156</u>	<u>147</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-03</u>	<u>160</u>	<u>149</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-04</u>	<u>154</u>	<u>155</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-05</u>	<u>156</u>	<u>145</u>		<u>≤ 10</u>			<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-06</u>	X	X	<u>261</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-07</u>			<u>265</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-08</u>			<u>252</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-09</u>			<u>259</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>49-10</u>			<u>258</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 156  
Average of Peel Test Values, Outside Track (ppi) (2) 151  
Average of Shear Test Values (ppi) 259

CQA TECHNICIAN: \_\_\_\_\_

  
Ted Stiles

Notes:

(1) Break code referenced to ASTM D 6392-99

(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. 307-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 50  
SEAM BETWEEN PANELS NO.: 51 / 5-61  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 20 to STA. 1 + 25  
REPAIR NO.: R- 221  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-19-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL	
	PEEL TEST <sup>(2)</sup>			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>50</u> -01	<u>158</u>	<u>156</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>50</u> -02	<u>148</u>	<u>162</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>50</u> -03	<u>184</u>	<u>138</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>50</u> -04	<u>176</u>	<u>135</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>50</u> -05	<u>156</u>	<u>150</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>50</u> -06	X	X	X	<u>255</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>50</u> -07				<u>259</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>50</u> -08				<u>255</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>50</u> -09				<u>247</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>50</u> -10				<u>255</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 164  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 148  
Average of Shear Test Values (ppi) 254

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 51  
SEAM BETWEEN PANELS NO.: 561, 565  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 10 to STA. 0 + 15  
REPAIR NO.: R- 226  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-19-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-08

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)				@ YIELD	@ BREAK			
	Inside Track	Outside Track							
DS- 51 -01	157	134	X	≤ 10	X	X	FTB	SE1	PASS
DS- 51 -02	142	137		≤ 10			FTB	SE1	PASS
DS- 51 -03	129	145		≤ 10			FTB	SE1	PASS
DS- 51 -04	131	136		≤ 10			FTB	SE1	PASS
DS- 51 -05	151	133		≤ 10			FTB	SE1	PASS
DS- 51 -06	X	X	213	X	≥ 10	≤ 50	FTB	SE1	PASS
DS- 51 -07			210		≥ 10	≤ 50	FTB	SE1	PASS
DS- 51 -08			210		≥ 10	≤ 50	FTB	SE1	PASS
DS- 51 -09			217		≥ 10	≤ 50	FTB	SE1	PASS
DS- 51 -10			197		≥ 10	≤ 50	FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 142  
Average of Peel Test Values, Outside Track (ppi) (2) 137  
Average of Shear Test Values (ppi) 209

CQA TECHNICIAN: [Signature]  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 52  
SEAM BETWEEN PANELS IN. 369 / 571  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 237  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- 52 -01	142	169	X	≤ 10	X	FTB	SE1	PASS	
DS- 52 -02	165	162		≤ 10		FTB	SE1	PASS	
DS- 52 -03	155	167		≤ 10		FTB	SE1	PASS	
DS- 52 -04	157	177		≤ 10		FTB	SE1	PASS	
DS- 52 -05	141	165		≤ 10		FTB	SE1	PASS	
DS- 52 -06	X	X	220	≥ 10	≥ 50	FTB	SE1	PASS	
DS- 52 -07			229	≥ 10	≥ 50	FTB	SE1	PASS	
DS- 52 -08			223	≥ 10	≥ 50	FTB	SE1	PASS	
DS- 52 -09			221	≥ 10	≥ 50	FTB	SE1	PASS	
DS- 52 -10			219	≥ 10	≥ 50	FTB	SE1	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 152  
Average of Peel Test Values, Outside Track (ppi) (2) 168  
Average of Shear Test Values (ppi) 222

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 53  
SEAM BETWEEN PANELS NO.: 5-70, 5-72  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 70 to STA. 0 + 75  
REPAIR NO.: R- 241  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 256380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>53</u> -01	<u>141</u>	<u>171</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -02	<u>158</u>	<u>169</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -03	<u>139</u>	<u>154</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -04	<u>137</u>	<u>171</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -05	<u>159</u>	<u>164</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -06	X	<u>216</u>	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -07		<u>221</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -08		<u>218</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -09		<u>212</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>53</u> -10		<u>225</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 146  
Average of Peel Test Values, Outside Track (ppi) (2) 165  
Average of Shear Test Values (ppi) 218

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 54  
SEAM BETWEEN PANELS NO.: 5-24, 5-25  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 70 to STA. 1 + 75  
REPAIR NO.: R- 242  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

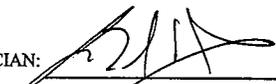
TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- 54 -01	161	150	X	≤ 10	X	FTB	SE1	PASS	
DS- 54 -02	155	164		≤ 10		FTB	SE1	PASS	
DS- 54 -03	145	161		≤ 10		FTB	SE1	PASS	
DS- 54 -04	151	148		≤ 10		FTB	SE1	PASS	
DS- 54 -05	144	147		≤ 10		FTB	SE1	PASS	
DS- 54 -06	X	X	X	209	≥ 10	≥ 50	FTB	SE1	PASS
DS- 54 -07				207	≥ 10	≥ 50	FTB	SE1	PASS
DS- 54 -08				218	≥ 10	≥ 50	FTB	SE1	PASS
DS- 54 -09				215	≥ 10	≥ 50	FTB	SE1	PASS
DS- 54 -10				218	≥ 10	≥ 50	FTB	SE1	PASS

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 151  
Average of Peel Test Values, Outside Track (ppi) (2) 154  
Average of Shear Test Values (ppi) 213

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 55  
SEAM BETWEEN PANELS NO.: S-2515-76  
DESTRUCTIVE SAMPLE LOCATION: STA. 2+21 to STA. 2+25  
REPAIR NO.: R- 244  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: Dem Tech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS-55-01	150	152	≤ 10			FTB	SE1	PASS
DS-55-02	139	139	≤ 10			FTB	SE1	PASS
DS-55-03	151	142	≤ 10			FTB	SE1	PASS
DS-55-04	127	150	≤ 10			FTB	SE1	PASS
DS-55-05	142	150	≤ 10			FTB	SE1	PASS
DS-55-06		198		≥ 10	≥ 50	FTB	SE1	PASS
DS-55-07		209		≥ 10	≥ 50	FTB	SE1	PASS
DS-55-08		208		≥ 10	≥ 50	FTB	SE1	PASS
DS-55-09		213		≥ 10	≥ 50	FTB	SE1	PASS
DS-55-10		201		≥ 10	≥ 50	FTB	SE1	PASS

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 141  
Average of Peel Test Values, Outside Track (ppi) (2) 146  
Average of Shear Test Values (ppi) 205

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 56  
SEAM BETWEEN PANELS NO.: S-77 1578  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 95 to STA. 1 + 00  
REPAIR NO.: R- 245  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DEMTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

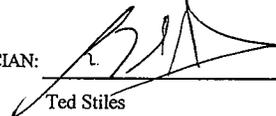
TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>56</u> - 01	<u>138</u>	<u>160</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>56</u> - 02	<u>135</u>	<u>148</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>56</u> - 03	<u>145</u>	<u>152</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>56</u> - 04	<u>155</u>	<u>158</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>56</u> - 05	<u>135</u>	<u>154</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>56</u> - 06	X	X	X	<u>209</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>56</u> - 07				<u>198</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>56</u> - 08				<u>208</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>56</u> - 09				<u>211</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>56</u> - 10				<u>206</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 141  
Average of Peel Test Values, Outside Track (ppi) (2) 154  
Average of Shear Test Values (ppi) 206

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 57  
SEAM BETWEEN PANELS NO.: 5-80 / 5-82  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 21 to STA. 0 + 25  
REPAIR NO.: R- 249  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>57</u> -01	<u>135</u>	<u>154</u>	$\leq 10$	$\geq 10$	$\geq 50$	FTB	SEI	PASS	
DS- <u>57</u> -02	<u>155</u>	<u>167</u>							
DS- <u>57</u> -03	<u>132</u>	<u>153</u>							
DS- <u>57</u> -04	<u>149</u>	<u>159</u>							
DS- <u>57</u> -05	<u>132</u>	<u>169</u>							
DS- <u>57</u> -06	$\geq 10$	$\geq 50$	$\geq 10$	$\geq 50$	$\geq 10$	FTB	SEI	PASS	
DS- <u>57</u> -07									<u>216</u>
DS- <u>57</u> -08									<u>215</u>
DS- <u>57</u> -09									<u>218</u>
DS- <u>57</u> -10									<u>205</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 140  
Average of Peel Test Values, Outside Track (ppi) (2) 160  
Average of Shear Test Values (ppi) 214

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 58  
SEAM BETWEEN PANELS NO.: 5-82 15-83  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 95 to STA. 2 + 00  
REPAIR NO.: R- 248  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

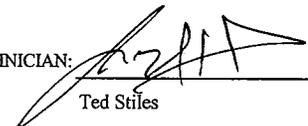
TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL
	PEEL TEST (2)			@ YIELD	@ BREAK			
	Inside Track	Outside Track						
DS- <u>58</u> -01	<u>124</u>	<u>146</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -02	<u>135</u>	<u>137</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -03	<u>133</u>	<u>127</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -04	<u>130</u>	<u>138</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -05	<u>140</u>	<u>135</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -06	X	X	X	<u>≥ 10</u>	<u>≤ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -07				<u>≥ 10</u>	<u>≤ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -08				<u>≥ 10</u>	<u>≤ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -09				<u>≥ 10</u>	<u>≤ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>58</u> -10				<u>≥ 10</u>	<u>≤ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 132  
Average of Peel Test Values, Outside Track (ppi) (2) 136  
Average of Shear Test Values (ppi) 210

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 59  
SEAM BETWEEN PANELS NO.: S-85 / S-87  
DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 21 to STA. 1 + 25  
REPAIR NO.: R- 254  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6  
QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>59</u> -01	<u>155</u>	<u>170</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>59</u> -02	<u>144</u>	<u>143</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>59</u> -03	<u>154</u>	<u>146</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>59</u> -04	<u>150</u>	<u>171</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>59</u> -05	<u>160</u>	<u>152</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>59</u> -06	X	X	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>59</u> -07				<u>238</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>59</u> -08				<u>234</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>59</u> -09				<u>237</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>59</u> -10				<u>241</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
		<u>240</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 152  
Average of Peel Test Values, Outside Track (ppi) (2) 156  
Average of Shear Test Values (ppi) 238

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 60  
SEAM BETWEEN PANELS NO.: S-88 / S-90  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 46 to STA. 0 + 50  
REPAIR NO.: R- 259  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>60</u> -01	<u>145</u>	<u>199</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>60</u> -02	<u>162</u>	<u>196</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>60</u> -03	<u>165</u>	<u>166</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>60</u> -04	<u>168</u>	<u>151</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>60</u> -05	<u>146</u>	<u>166</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>60</u> -06	X	X	X	<u>252</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>60</u> -07				<u>247</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>60</u> -08				<u>246</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>60</u> -09				<u>254</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>60</u> -10				<u>249</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 157  
Average of Peel Test Values, Outside Track (ppi) (2) 165  
Average of Shear Test Values (ppi) 249

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 61  
SEAM BETWEEN PANELS NO.: 5-92 / 5-93  
DESTRUCTIVE SAMPLE LOCATION: STA. 0+21 to STA. 0+25  
REPAIR NO.: R- 279  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DEMTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>61</u> -01	<u>152</u>	<u>152</u>	X	<u>≤10</u>	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>61</u> -02	<u>164</u>	<u>163</u>		<u>≤10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>61</u> -03	<u>188</u>	<u>149</u>		<u>≤10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>61</u> -04	<u>167</u>	<u>179</u>		<u>≤10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>61</u> -05	<u>162</u>	<u>179</u>		<u>≤10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>61</u> -06	X	X	X	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>61</u> -07				<u>207</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>61</u> -08				<u>241</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>61</u> -09				<u>239</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>61</u> -10				<u>240</u>	<u>≥10</u>	<u>≥50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 166  
Average of Peel Test Values, Outside Track (ppi) (2) 164  
Average of Shear Test Values (ppi) 234

CQA TECHNICIAN: [Signature]  
Ped Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 62  
SEAM BETWEEN PANELS NO.: S-98/5-99  
DESTRUCTIVE SAMPLE LOCATION: STA. 0+46 to STA. 0+50  
REPAIR NO.: R- 276  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-21-08  
TENSIO METER TYPE / BRAND: DemTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

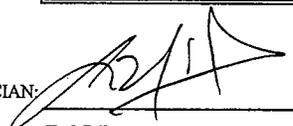
TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>62</u> -01	<u>137</u>	<u>139</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>62</u> -02	<u>137</u>	<u>134</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>62</u> -03	<u>140</u>	<u>132</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>62</u> -04	<u>145</u>	<u>127</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>62</u> -05	<u>165</u>	<u>147</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>62</u> -06	X	X	X	<u>233</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>62</u> -07				<u>221</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>62</u> -08				<u>231</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>62</u> -09				<u>232</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>62</u> -10				<u>231</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 144  
Average of Peel Test Values, Outside Track (ppi) (2) 135  
Average of Shear Test Values (ppi) 229

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 63  
 SEAM BETWEEN PANELS NO.: 5610 1568  
 DESTRUCTIVE SAMPLE LOCATION: STA. 1 + 21 to STA 1 + 25  
 REPAIR NO.: R-232  
 TEST METHOD: ASTM D 6392-99  
 SPECIMEN CONFIGURATION: 1-inch strip  
 STRAIN RATE: 2 inches / minute  
 MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
 TESTING DATE: 3-22-08  
 TENSIO METER TYPE / BRAND: DEMTELH  
 SERIAL NUMBER: 206380  
 CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>63</u> -01	<u>138</u>	<u>157</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>63</u> -02	<u>135</u>	<u>161</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>63</u> -03	<u>124</u>	<u>148</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>63</u> -04	<u>130</u>	<u>156</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>63</u> -05	<u>135</u>	<u>140</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>63</u> -06	X	X	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>63</u> -07				<u>191</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>63</u> -08				<u>187</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>63</u> -09				<u>189</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>63</u> -10				<u>199</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
		<u>173</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 132  
 Average of Peel Test Values, Outside Track (ppi) (2) 152  
 Average of Shear Test Values (ppi) 187

CQA TECHNICIAN:   
 Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
 (2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 64  
SEAM BETWEEN PANELS NO.: S-90 / T-87  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 16 to STA. 0 + 20  
REPAIR NO.: R- 269  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-21-08  
TESTING DATE: 3-22-08  
TENSIO METER TYPE / BRAND: DemTECH  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			@ YIELD	@ BREAK				
	Inside Track	Outside Track							
DS- <u>64</u> -01	<u>144</u>	<u>136</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>64</u> -02	<u>154</u>	<u>156</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>64</u> -03	<u>163</u>	<u>174</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>64</u> -04	<u>161</u>	<u>154</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>64</u> -05	<u>144</u>	<u>169</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>64</u> -06	X	X	X	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	
DS- <u>64</u> -07				<u>195</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>64</u> -08				<u>188</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>64</u> -09				<u>180</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
DS- <u>64</u> -10				<u>177</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>
		<u>193</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SE1</u>	<u>PASS</u>	

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 153  
Average of Peel Test Values, Outside Track (ppi) (2) 157  
Average of Shear Test Values (ppi) 186

CQA TECHNICIAN: Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 65  
SEAM BETWEEN PANELS NO.: T-86 / T-91  
DESTRUCTIVE SAMPLE LOCATION: STA. 0+21 to STA. 0+25  
REPAIR NO.: R- 474  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-22-08  
TESTING DATE: 3-22-08  
TENSIO METER TYPE / BRAND: Dematech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE <sup>(1)</sup>	RESULTS PASS / FAIL	
	PEEL TEST <sup>(2)</sup>			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>65</u> -01	<u>115</u>	<u>125</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>65</u> -02	<u>128</u>	<u>127</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>65</u> -03	<u>135</u>	<u>137</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>65</u> -04	<u>143</u>	<u>141</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>65</u> -05	<u>125</u>	<u>119</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>65</u> -06	X	X	X		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>65</u> -07				<u>166</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>65</u> -08				<u>169</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>65</u> -09				<u>162</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>65</u> -10				<u>170</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
		<u>159</u>		<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 129  
Average of Peel Test Values, Outside Track (ppi) <sup>(2)</sup> 129  
Average of Shear Test Values (ppi) 165

CQA TECHNICIAN: Ted Stiles  
*Ted Stiles*

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 66  
SEAM BETWEEN PANELS NO.: 7-97 / 7-98  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 46 to STA. 0 + 50  
REPAIR NO.: R- 494  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-22-08  
TESTING DATE: 3-22-08  
TENSIO METER TYPE / BRAND: DanTech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>66</u> -01	<u>130</u>	<u>118</u>	X	<u>≤ 10</u>	X	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>66</u> -02	<u>140</u>	<u>125</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>66</u> -03	<u>125</u>	<u>119</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>66</u> -04	<u>135</u>	<u>126</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>66</u> -05	<u>124</u>	<u>120</u>		<u>≤ 10</u>		<u>FTB</u>	<u>SEI</u>	<u>PASS</u>	
DS- <u>66</u> -06	X	X	X	<u>187</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>66</u> -07				<u>195</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>66</u> -08				<u>192</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>66</u> -09				<u>201</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>
DS- <u>66</u> -10				<u>199</u>	<u>≥ 10</u>	<u>≥ 50</u>	<u>FTB</u>	<u>SEI</u>	<u>PASS</u>

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 130  
Average of Peel Test Values, Outside Track (ppi) (2) 121  
Average of Shear Test Values (ppi) 194

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 67  
SEAM BETWEEN PANELS NO. C-11 / S-88  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 11 to STA. 0 + 15  
REPAIR NO.: R- 519  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-22-08  
TESTING DATE: 3-23-08  
TENSIO METER TYPE / BRAND: Demtek II  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>67</u> -01	157	163	X	≤ 10	X	FTB	SEI	PASS	
DS- <u>67</u> -02	157	138		≤ 10		FTB	SEI	PASS	
DS- <u>67</u> -03	147	160		≤ 10		FTB	SEI	PASS	
DS- <u>67</u> -04	127	145		≤ 10		FTB	SEI	PASS	
DS- <u>67</u> -05	130	128		≤ 10		FTB	SEI	PASS	
DS- <u>67</u> -06	X	X	219	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>67</u> -07			229	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>67</u> -08			225	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>67</u> -09			228	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>67</u> -10			222	≥ 10	≥ 50	FTB	SEI	PASS	

SAMPLE: PASS / FAIL

Average of Peel Test Values, Inside Track (ppi) 143  
Average of Peel Test Values, Outside Track (ppi) (2) 146  
Average of Shear Test Values (ppi) 224

CQA TECHNICIAN: Ted Stiles  
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

# FIELD (QC) DESTRUCTIVE SEAM STRENGTH TESTING

EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS- 68  
SEAM BETWEEN PANELS NO.: C-11 15-67  
DESTRUCTIVE SAMPLE LOCATION: STA. 0 + 12 to STA. 0 + 16  
REPAIR NO.: R- 518  
TEST METHOD: ASTM D 6392-99  
SPECIMEN CONFIGURATION: 1-inch strip  
STRAIN RATE: 2 inches / minute  
MINIMUM PEEL & SHEAR VALUES: Fusion Weld - 91 ppi & 120 ppi  
Extrusion Weld - 78 ppi & 120 ppi

SAMPLE DATE: 3-22-08  
TESTING DATE: 3-23-08  
TENSIO METER TYPE / BRAND: Demtech  
SERIAL NUMBER: 206380  
CALIBRATION DATE: 5-23-07

TABLE 6

QC DESTRUCTIVE SEAM STRENGTH TESTING

SAMPLE NUMBER	MAXIMUM TENSION (ppi)		PEEL INCURSION (%)	ELONGATION IN SHEAR (%)		FTB or NON-FTB	LOCUS OF BREAK CODE (1)	RESULTS PASS / FAIL	
	PEEL TEST (2)			SHEAR TEST	@ YIELD				@ BREAK
	Inside Track	Outside Track							
DS- <u>68</u> -01	169	145	≤ 10	X	X	FTB	SEI	PASS	
DS- <u>68</u> -02	150	141	≤ 10			FTB	SEI	PASS	
DS- <u>68</u> -03	150	135	≤ 10			FTB	SEI	PASS	
DS- <u>68</u> -04	124	151	≤ 10			FTB	SEI	PASS	
DS- <u>68</u> -05	157	153	≤ 10			FTB	SEI	PASS	
DS- <u>68</u> -06	X	X	215	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>68</u> -07			221	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>68</u> -08			210	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>68</u> -09			212	≥ 10	≥ 50	FTB	SEI	PASS	
DS- <u>68</u> -10			217	≥ 10	≥ 50	FTB	SEI	PASS	

SAMPLE: PASS FAIL

Average of Peel Test Values, Inside Track (ppi) 150  
Average of Peel Test Values, Outside Track (ppi) (2) 145  
Average of Shear Test Values (ppi) 215

CQA TECHNICIAN:   
Ted Stiles

Notes: (1) Break code referenced to ASTM D 6392-99  
(2) Fillet Extrusion Welds have one side tested in peel

**TABLE NO. 7**  
**CQA DESTRUCTIVE SEAM STRENGTH TESTING**

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS- 1

**Sample Date:** 3-10-08

**SEAM BETWEEN PANELS NO.:** S1/S3

**Testing Date:** 3-17-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 91 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 1 - 01	144	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 1 - 02	152	142		< 10			SE-1	FTB	PASS
D S- 1 - 03	141	139		< 10			SE-1	FTB	PASS
D S- 1 - 04	138	145		< 10			SE-1	FTB	PASS
D S- 1 - 05	139	143		< 10			SE-1	FTB	PASS
D S- 1 - 06	X	X	217	> 10	> 50	BRK	FTB	PASS	
D S- 1 - 07			217	> 10	> 50	BRK	FTB	PASS	
D S- 1 - 08			216	> 10	> 50	BRK	FTB	PASS	
D S- 1 - 09			219	> 10	> 50	BRK	FTB	PASS	
D S- 1 - 10			214	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 142.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 141.8 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 216.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS- 2

**Sample Date:** 3-10-08

**SEAM BETWEEN PANELS NO.:** S4/S6

**Testing Date:** 3-17-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 91 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 2 - 01	141	176	X	< 10	X	X	SE-1	FTB	PASS
D S- 2 - 02	130	183		< 10			SE-1	FTB	PASS
D S- 2 - 03	123	176		< 10			SE-1	FTB	PASS
D S- 2 - 04	127	180		< 10			SE-1	FTB	PASS
D S- 2 - 05	129	177		< 10			SE-1	FTB	PASS
D S- 2 - 06	X	X	227	> 10	> 50	BRK	FTB	PASS	
D S- 2 - 07			229	> 10	> 50	BRK	FTB	PASS	
D S- 2 - 08			233	> 10	> 50	BRK	FTB	PASS	
D S- 2 - 09			221	> 10	> 50	BRK	FTB	PASS	
D S- 2 - 10			226	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 130.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 178.4 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 227.2 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-3

**Sample Date:** 3-10-08

**SEAM BETWEEN PANELS NO.:** S6/S7

**Testing Date:** 3-17-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 91 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 3 - 01	140	145	X	< 10	X	X	SE-1	FTB	PASS
D S- 3 - 02	141	151		< 10			SE-1	FTB	PASS
D S- 3 - 03	143	149		< 10			SE-1	FTB	PASS
D S- 3 - 04	140	144		< 10			SE-1	FTB	PASS
D S- 3 - 05	143	153		< 10			SE-1	FTB	PASS
D S- 3 - 06	X	X	215	> 10	> 50	BRK	FTB	PASS	
D S- 3 - 07			218	> 10	> 50	BRK	FTB	PASS	
D S- 3 - 08			213	> 10	> 50	BRK	FTB	PASS	
D S- 3 - 09			220	> 10	> 50	BRK	FTB	PASS	
D S- 3 - 10			217	> 10	> 50	BRK	FTB	PASS	

≤ 10%      ≥ 10%      ≥ 50%

Average of Peel Test Values, Inside Track: 141.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 148.4 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 216.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-4

Sample Date: 3-10-08

SEAM BETWEEN PANELS NO.: S9/S11

Testing Date: 3-17-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)		SHEAR TEST	PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*				@ YIELD	@ BREAK			
D S- 4 - 01	152	153	X	< 10	X	X	SE-1	FTB	PASS
D S- 4 - 02	158	141		< 10			SE-1	FTB	PASS
D S- 4 - 03	143	149		< 10			SE-1	FTB	PASS
D S- 4 - 04	138	146		< 10			SE-1	FTB	PASS
D S- 4 - 05	148	156		< 10			SE-1	FTB	PASS
D S- 4 - 06	X	X	228	> 10	> 50	BRK	FTB	PASS	
D S- 4 - 07			220	> 10	> 50	BRK	FTB	PASS	
D S- 4 - 08			225	> 10	> 50	BRK	FTB	PASS	
D S- 4 - 09			232	> 10	> 50	BRK	FTB	PASS	
D S- 4 - 10			226	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 147.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 149.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 226.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-5

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S10/S12

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 5 - 01	133	144	X	< 10	X	X	SE-1	FTB	PASS
D S- 5 - 02	138	141		< 10			SE-1	FTB	PASS
D S- 5 - 03	136	140		< 10			SE-1	FTB	PASS
D S- 5 - 04	137	147		< 10			SE-1	FTB	PASS
D S- 5 - 05	136	144		< 10			SE-1	FTB	PASS
D S- 5 - 06	X	X	X	225	> 10	> 50	BRK	FTB	PASS
D S- 5 - 07				219	> 10	> 50	BRK	FTB	PASS
D S- 5 - 08				217	> 10	> 50	BRK	FTB	PASS
D S- 5 - 09				220	> 10	> 50	BRK	FTB	PASS
D S- 5 - 10				223	> 10	> 50	BRK	FTB	PASS
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 136.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 143.2 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 220.8 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-6

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S13/S12

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 6 - 01	147	159	X	< 10	X	X	SE-1	FTB	PASS
D S- 6 - 02	149	163		< 10			SE-1	FTB	PASS
D S- 6 - 03	154	152		< 10			SE-1	FTB	PASS
D S- 6 - 04	160	159		< 10			SE-1	FTB	PASS
D S- 6 - 05	153	164		< 10			SE-1	FTB	PASS
D S- 6 - 06	X	X	225	> 10	> 50	BRK	FTB	PASS	
D S- 6 - 07			200	> 10	> 50	BRK	FTB	PASS	
D S- 6 - 08			214	> 10	> 50	BRK	FTB	PASS	
D S- 6 - 09			220	> 10	> 50	BRK	FTB	PASS	
D S- 6 - 10			223	> 10	> 50	BRK	FTB	PASS	

≤ 10%
≥ 10%
≥ 50%

Average of Peel Test Values, Inside Track: 152.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 159.4 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 216.4 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-7

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S15/S16

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 7 - 01	137	136	X	< 10	X	X	SE-1	FTB	PASS
D S- 7 - 02	139	137		< 10			SE-1	FTB	PASS
D S- 7 - 03	146	135		< 10			SE-1	FTB	PASS
D S- 7 - 04	151	130		< 10			SE-1	FTB	PASS
D S- 7 - 05	144	126		< 10			SE-1	FTB	PASS
D S- 7 - 06	X	X	X	206	> 10	> 50	BRK	FTB	PASS
D S- 7 - 07				203	> 10	> 50	BRK	FTB	PASS
D S- 7 - 08				209	> 10	> 50	BRK	FTB	PASS
D S- 7 - 09				205	> 10	> 50	BRK	FTB	PASS
D S- 7 - 10				206	> 10	> 50	BRK	FTB	PASS

≤ 10%      ≥ 10%      ≥ 50%

Average of Peel Test Values, Inside Track: 143.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 132.8 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 205.8 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-8

**Sample Date:** 3-10-08

**SEAM BETWEEN PANELS NO.:** S17/S18

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 8 - 01	145	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 8 - 02	147	135		< 10			SE-1	FTB	PASS
D S- 8 - 03	161	145		< 10			SE-1	FTB	PASS
D S- 8 - 04	158	140		< 10			SE-1	FTB	PASS
D S- 8 - 05	166	149		< 10			SE-1	FTB	PASS
D S- 8 - 06	X	X	217	> 10	> 50	BRK	FTB	PASS	
D S- 8 - 07			211	> 10	> 50	BRK	FTB	PASS	
D S- 8 - 08			219	> 10	> 50	BRK	FTB	PASS	
D S- 8 - 09			213	> 10	> 50	BRK	FTB	PASS	
D S- 8 - 10			216	> 10	> 50	BRK	FTB	PASS	

≤ 10%
≥ 10%
≥ 50%

Average of Peel Test Values, Inside Track: 155.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 141.8 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 215.2 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-9

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S18/S20

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S - 9 - 01	118	151	X	< 10	X	X	SE-1	FTB	PASS
D S - 9 - 02	137	148		< 10			SE-1	FTB	PASS
D S - 9 - 03	140	151		< 10			SE-1	FTB	PASS
D S - 9 - 04	138	147		< 10			SE-1	FTB	PASS
D S - 9 - 05	136	143		< 10			SE-1	FTB	PASS
D S - 9 - 06	X	X	205	> 10	> 50	BRK	FTB	PASS	
D S - 9 - 07			201	> 10	> 50	BRK	FTB	PASS	
D S - 9 - 08			208	> 10	> 50	BRK	FTB	PASS	
D S - 9 - 09			206	> 10	> 50	BRK	FTB	PASS	
D S - 9 - 10			204	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 133.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 148.0 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 204.8 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-10

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S20/S21

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 10 - 01	129	133	X	< 10	X	X	SE-1	FTB	PASS
D S- 10 - 02	120	130		< 10			SE-1	FTB	PASS
D S- 10 - 03	141	137		< 10			SE-1	FTB	PASS
D S- 10 - 04	133	135		< 10			SE-1	FTB	PASS
D S- 10 - 05	130	139		< 10			SE-1	FTB	PASS
D S- 10 - 06	X	X	220	> 10	> 50	BRK	FTB	PASS	
D S- 10 - 07			210	> 10	> 50	BRK	FTB	PASS	
D S- 10 - 08			218	> 10	> 50	BRK	FTB	PASS	
D S- 10 - 09			213	> 10	> 50	BRK	FTB	PASS	
D S- 10 - 10			216	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 130.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 134.8 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 215.4 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-11

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S21/S22

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 11 - 01	106	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 11 - 02	109	138		< 10			SE-1	FTB	PASS
D S- 11 - 03	113	151		< 10			SE-1	FTB	PASS
D S- 11 - 04	107	145		< 10			SE-1	FTB	PASS
D S- 11 - 05	109	139		< 10			SE-1	FTB	PASS
D S- 11 - 06	X	X	207	> 10	> 50	BRK	FTB	PASS	
D S- 11 - 07			213	> 10	> 50	BRK	FTB	PASS	
D S- 11 - 08			209	> 10	> 50	BRK	FTB	PASS	
D S- 11 - 09			205	> 10	> 50	BRK	FTB	PASS	
D S- 11 - 10			209	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 108.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 142.6 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 208.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-12

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** T8/T7

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 12 - 01	134	141	X	< 10	X	X	SE-1	FTB	PASS
D S- 12 - 02	19	155		< 10			SE-1	FTB	PASS
D S- 12 - 03	143	150		< 10			SE-1	FTB	PASS
D S- 12 - 04	147	149		< 10			SE-1	FTB	PASS
D S- 12 - 05	138	158		< 10			SE-1	FTB	PASS
D S- 12 - 06	X	X	210	> 10	> 50	BRK	FTB	PASS	
D S- 12 - 07			218	> 10	> 50	BRK	FTB	PASS	
D S- 12 - 08			215	> 10	> 50	BRK	FTB	PASS	
D S- 12 - 09			215	> 10	> 50	BRK	FTB	PASS	
D S- 12 - 10			210	> 10	> 50	BRK	FTB	PASS	

≤ 10%
≥ 10%
≥ 50%

Average of Peel Test Values, Inside Track: 116.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 150.6 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 213.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-13

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S22/S24

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 13 - 01	154	149	X	< 10	X	X	SE-1	FTB	PASS
D S- 13 - 02	141	161		< 10			SE-1	FTB	PASS
D S- 13 - 03	150	148		< 10			SE-1	FTB	PASS
D S- 13 - 04	139	168		< 10			SE-1	FTB	PASS
D S- 13 - 05	146	158		< 10			SE-1	FTB	PASS
D S- 13 - 06	X	X	215	> 10	> 50	BRK	FTB	PASS	
D S- 13 - 07			215	> 10	> 50	BRK	FTB	PASS	
D S- 13 - 08			216	> 10	> 50	BRK	FTB	PASS	
D S- 13 - 09			214	> 10	> 50	BRK	FTB	PASS	
D S- 13 - 10			212	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 146.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 156.8 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 214.4 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-14

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** S24/S26

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 14 - 01	164	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 14 - 02	158	143		< 10			SE-1	FTB	PASS
D S- 14 - 03	151	149		< 10			SE-1	FTB	PASS
D S- 14 - 04	153	150		< 10			SE-1	FTB	PASS
D S- 14 - 05	149	153		< 10			SE-1	FTB	PASS
D S- 14 - 06	X	X	206	> 10	> 50	BRK	FTB	PASS	
D S- 14 - 07			203	> 10	> 50	BRK	FTB	PASS	
D S- 14 - 08			214	> 10	> 50	BRK	FTB	PASS	
D S- 14 - 09			209	> 10	> 50	BRK	FTB	PASS	
D S- 14 - 10			211	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 155.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 147.0 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 208.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-15

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** S25/S27

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 15 - 01	140	158	X	< 10	X	X	SE-1	FTB	PASS
D S- 15 - 02	129	150		< 10			SE-1	FTB	PASS
D S- 15 - 03	137	148		< 10			SE-1	FTB	PASS
D S- 15 - 04	140	153		< 10			SE-1	FTB	PASS
D S- 15 - 05	140	158		< 10			SE-1	FTB	PASS
D S- 15 - 06	X	X	207	> 10	> 50	BRK	FTB	PASS	
D S- 15 - 07			203	> 10	> 50	BRK	FTB	PASS	
D S- 15 - 08			205	> 10	> 50	BRK	FTB	PASS	
D S- 15 - 09			207	> 10	> 50	BRK	FTB	PASS	
D S- 15 - 10			207	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 137.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 153.4 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 205.8 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-16

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S29/S30

**Testing Date:** 3-14-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 16 - 01	124	131	X	< 10	X	X	SE-3	FTB	PASS
D S- 16 - 02	136	129		< 10			SE-3	FTB	PASS
D S- 16 - 03	144	137		< 10			SE-3	FTB	PASS
D S- 16 - 04	140	139		< 10			SE-3	FTB	PASS
D S- 16 - 05	144	141		< 10			SE-3	FTB	PASS
D S- 16 - 06	X	X	176	> 10	> 50	SE-1	FTB	PASS	
D S- 16 - 07			167	> 10	> 50	SE-1	FTB	PASS	
D S- 16 - 08			170	> 10	> 50	SE-1	FTB	PASS	
D S- 16 - 09			168	> 10	> 50	SE-1	FTB	PASS	
D S- 16 - 10			167	> 10	> 50	SE-1	FTB	PASS	

≤ 10%
≥ 10%
≥ 50%

Average of Peel Test Values, Inside Track: 137.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 135.4 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 169.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-17

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S29/S31

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 17 - 01	140	143	X	< 10	X	X	SE-1	FTB	PASS
D S- 17 - 02	137	147		< 10			SE-1	FTB	PASS
D S- 17 - 03	140	148		< 10			SE-1	FTB	PASS
D S- 17 - 04	135	139		< 10			SE-1	FTB	PASS
D S- 17 - 05	132	137		< 10			SE-1	FTB	PASS
D S- 17 - 06	X	X	209	> 10	> 50	BRK	FTB	PASS	
D S- 17 - 07			207	> 10	> 50	BRK	FTB	PASS	
D S- 17 - 08			208	> 10	> 50	BRK	FTB	PASS	
D S- 17 - 09			210	> 10	> 50	BRK	FTB	PASS	
D S- 17 - 10			213	> 10	> 50	BRK	FTB	PASS	

≤ 10%
≥ 10%
≥ 50%

Average of Peel Test Values, Inside Track: 136.8 ppi

**Tested by:** JOHN MATHEW

Average of Peel Test Values, Outside Track: 142.8 ppi

**Checked by:** PAUL YARBER

Average of Shear Test Values: 209.4 ppi

**Reviewed by:** JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-18

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S31/S33

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 18 - 01	147	142	X	< 10	X	X	SE-1	FTB	PASS
D S- 18 - 02	154	140		< 10			SE-1	FTB	PASS
D S- 18 - 03	166	147		< 10			SE-1	FTB	PASS
D S- 18 - 04	158	162		< 10			SE-1	FTB	PASS
D S- 18 - 05	153	160		< 10			SE-1	FTB	PASS
D S- 18 - 06	X	X	221	> 10	> 50	BRK	FTB	PASS	
D S- 18 - 07			220	> 10	> 50	BRK	FTB	PASS	
D S- 18 - 08			221	> 10	> 50	BRK	FTB	PASS	
D S- 18 - 09			221	> 10	> 50	BRK	FTB	PASS	
D S- 18 - 10			218	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 155.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 150.2 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 220.2 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-19

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S33/S34

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track (*)							
D S- 19 - 01	160	129	X	< 10	X	X	SE-1	FTB	PASS
D S- 19 - 02	148	134		< 10			SE-1	FTB	PASS
D S- 19 - 03	154	139		< 10			SE-1	FTB	PASS
D S- 19 - 04	146	133		< 10			SE-1	FTB	PASS
D S- 19 - 05	149	137		< 10			SE-1	FTB	PASS
D S- 19 - 06	X	X	223	> 10	> 50	BRK	FTB	PASS	
D S- 19 - 07			229	> 10	> 50	BRK	FTB	PASS	
D S- 19 - 08			212	> 10	> 50	BRK	FTB	PASS	
D S- 19 - 09			224	> 10	> 50	BRK	FTB	PASS	
D S- 19 - 10			220	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 151.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 134.4 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 221.6 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\* Fillet Extrusion welds have one side tested in Peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-20

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** S34/S36

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 20 - 01	138	143	X	< 10	X	X	SE-1	FTB	PASS
D S- 20 - 02	135	142		< 10			SE-1	FTB	PASS
D S- 20 - 03	140	145		< 10			SE-1	FTB	PASS
D S- 20 - 04	144	149		< 10			SE-1	FTB	PASS
D S- 20 - 05	150	156		< 10			SE-1	FTB	PASS
D S- 20 - 06	X	X	215	> 10	> 50	BRK	FTB	PASS	
D S- 20 - 07			212	> 10	> 50	BRK	FTB	PASS	
D S- 20 - 08			210	> 10	> 50	BRK	FTB	PASS	
D S- 20 - 09			217	> 10	> 50	BRK	FTB	PASS	
D S- 20 - 10			216	> 10	> 50	BRK	FTB	PASS	

≤ 10%
≥ 10%
≥ 50%

Average of Peel Test Values, Inside Track: 141.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 147.0 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 214.0 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-21

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** T20/T21

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 21 - 01	131	128	X	< 10	X	X	SE-1	FTB	PASS
D S- 21 - 02	138	143		< 10			SE-1	FTB	PASS
D S- 21 - 03	140	148		< 10			SE-1	FTB	PASS
D S- 21 - 04	148	153		< 10			SE-1	FTB	PASS
D S- 21 - 05	144	151		< 10			SE-1	FTB	PASS
D S- 21 - 06	X	X	216	> 10	> 50	BRK	FTB	PASS	
D S- 21 - 07			214	> 10	> 50	BRK	FTB	PASS	
D S- 21 - 08			216	> 10	> 50	BRK	FTB	PASS	
D S- 21 - 09			215	> 10	> 50	BRK	FTB	PASS	
D S- 21 - 10			214	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 140.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 144.6 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 215.0 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-22

**Sample Date:** 3-12-08

**SEAM BETWEEN PANELS NO.:** T27/T28

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 141

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** April 10, 2007

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 22 - 01	123	117	X	< 10	X	X	SE-1	FTB	PASS
D S- 22 - 02	129	115		< 10			SE-1	FTB	PASS
D S- 22 - 03	119	108		< 10			SE-1	FTB	PASS
D S- 22 - 04	126	118		< 10			SE-1	FTB	PASS
D S- 22 - 05	119	126		< 10			SE-1	FTB	PASS
D S- 22 - 06	X	X	203	> 10	> 50	BRK	FTB	PASS	
D S- 22 - 07			200	> 10	> 50	BRK	FTB	PASS	
D S- 22 - 08			201	> 10	> 50	BRK	FTB	PASS	
D S- 22 - 09			197	> 10	> 50	BRK	FTB	PASS	
D S- 22 - 10			201	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 123.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 116.8 ppi

Checked by: PAUL YARBER

Average of Shear Test Values: 200.4 ppi

Reviewed by: JEFF HELVEY, P.E.

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-23

Sample Date: 3-11-08

SEAM BETWEEN PANELS NO.: T37/T38

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 23 - 01	144	131	X	< 10	X	X	SE-1	FTB	PASS
D S- 23 - 02	128	133		< 10			SE-1	FTB	PASS
D S- 23 - 03	135	130		< 10			SE-1	FTB	PASS
D S- 23 - 04	139	126		< 10			SE-1	FTB	PASS
D S- 23 - 05	135	131		< 10			SE-1	FTB	PASS
D S- 23 - 06	X	X	208	> 10	> 50	BRK	FTB	PASS	
D S- 23 - 07			213	> 10	> 50	BRK	FTB	PASS	
D S- 23 - 08			205	> 10	> 50	BRK	FTB	PASS	
D S- 23 - 09			209	> 10	> 50	BRK	FTB	PASS	
D S- 23 - 10			204	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 136.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 130.2 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 207.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-24

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** S37/S38

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 24 - 01	151	137	X	< 10	X	X	SE-1	FTB	PASS
D S- 24 - 02	165	140		< 10			SE-1	FTB	PASS
D S- 24 - 03	158	138		< 10			SE-1	FTB	PASS
D S- 24 - 04	155	142		< 10			SE-1	FTB	PASS
D S- 24 - 05	153	138		< 10			SE-1	FTB	PASS
D S- 24 - 06	X	X	211	> 10	> 50	BRK	FTB	PASS	
D S- 24 - 07			214	> 10	> 50	BRK	FTB	PASS	
D S- 24 - 08			210	> 10	> 50	BRK	FTB	PASS	
D S- 24 - 09			210	> 10	> 50	BRK	FTB	PASS	
D S- 24 - 10			213	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 156.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 139.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 211.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-25

Sample Date: 3-11-08

SEAM BETWEEN PANELS NO.: S41/S42

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 25 - 01	153	129	X	< 10	X	X	SE-1	FTB	PASS
D S- 25 - 02	151	130		< 10			SE-1	FTB	PASS
D S- 25 - 03	155	132		< 10			SE-1	FTB	PASS
D S- 25 - 04	147	127		< 10			SE-1	FTB	PASS
D S- 25 - 05	140	122		< 10			SE-1	FTB	PASS
D S- 25 - 06	X	X	205	> 10	> 50	BRK	FTB	PASS	
D S- 25 - 07			208	> 10	> 50	BRK	FTB	PASS	
D S- 25 - 08			209	> 10	> 50	BRK	FTB	PASS	
D S- 25 - 09			207	> 10	> 50	BRK	FTB	PASS	
D S- 25 - 10			209	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 149.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 128.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 207.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-26

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: S42/S44

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 26 - 01	144	158	X	< 10	X	X	SE-1	FTB	PASS
D S- 26 - 02	123	152		< 10			SE-1	FTB	PASS
D S- 26 - 03	137	141		< 10			SE-1	FTB	PASS
D S- 26 - 04	133	154		< 10			SE-1	FTB	PASS
D S- 26 - 05	139	150		< 10			SE-1	FTB	PASS
D S- 26 - 06	X	X	207	> 10	> 50	BRK	FTB	PASS	
D S- 26 - 07			209	> 10	> 50	BRK	FTB	PASS	
D S- 26 - 08			207	> 10	> 50	BRK	FTB	PASS	
D S- 26 - 09			211	> 10	> 50	BRK	FTB	PASS	
D S- 26 - 10			206	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 135.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 151.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 208.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-27

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: S44/S46

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 27 - 01	159	144	X	< 10	X	X	SE-1	FTB	PASS
D S- 27 - 02	157	140		< 10			SE-1	FTB	PASS
D S- 27 - 03	145	142		< 10			SE-1	FTB	PASS
D S- 27 - 04	147	128		< 10			SE-1	FTB	PASS
D S- 27 - 05	140	134		< 10			SE-1	FTB	PASS
D S- 27 - 06	X	X	220	> 10	> 50	BRK	FTB	PASS	
D S- 27 - 07			217	> 10	> 50	BRK	FTB	PASS	
D S- 27 - 08			223	> 10	> 50	BRK	FTB	PASS	
D S- 27 - 09			216	> 10	> 50	BRK	FTB	PASS	
D S- 27 - 10			219	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 149.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 137.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 219.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-28

Sample Date: 3-12-08

SEAM BETWEEN PANELS NO.: S46/S48

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 28 - 01	158	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 28 - 02	150	143		< 10			SE-1	FTB	PASS
D S- 28 - 03	139	147		< 10			SE-1	FTB	PASS
D S- 28 - 04	145	148		< 10			SE-1	FTB	PASS
D S- 28 - 05	140	137		< 10			SE-1	FTB	PASS
D S- 28 - 06	X	X	216	> 10	> 50	BRK	FTB	PASS	
D S- 28 - 07			210	> 10	> 50	BRK	FTB	PASS	
D S- 28 - 08			214	> 10	> 50	BRK	FTB	PASS	
D S- 28 - 09			215	> 10	> 50	BRK	FTB	PASS	
D S- 28 - 10			215	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 146.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 143.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 214.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-29

Sample Date: 3-11-08

SEAM BETWEEN PANELS NO.: S36/S37

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 29 - 01	151	158	X	< 10	X	X	SE-1	FTB	PASS
D S- 29 - 02	137	145		< 10			SE-1	FTB	PASS
D S- 29 - 03	143	138		< 10			SE-1	FTB	PASS
D S- 29 - 04	154	148		< 10			SE-1	FTB	PASS
D S- 29 - 05	150	155		< 10			SE-1	FTB	PASS
D S- 29 - 06	X	X	219	> 10	> 50	BRK	FTB	PASS	
D S- 29 - 07			218	> 10	> 50	BRK	FTB	PASS	
D S- 29 - 08			216	> 10	> 50	BRK	FTB	PASS	
D S- 29 - 09			210	> 10	> 50	BRK	FTB	PASS	
D S- 29 - 10			213	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 147.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 148.8 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 215.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-30

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: S50/S51

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 30 - 01	137	138	X	< 10	X	X	SE-1	FTB	PASS
D S- 30 - 02	140	136		< 10			SE-1	FTB	PASS
D S- 30 - 03	151	145		< 10			SE-1	FTB	PASS
D S- 30 - 04	155	138		< 10			SE-1	FTB	PASS
D S- 30 - 05	152	147		< 10			SE-1	FTB	PASS
D S- 30 - 06	X	X	213	> 10	> 50	BRK	FTB	PASS	
D S- 30 - 07			209	> 10	> 50	BRK	FTB	PASS	
D S- 30 - 08			205	> 10	> 50	BRK	FTB	PASS	
D S- 30 - 09			211	> 10	> 50	BRK	FTB	PASS	
D S- 30 - 10			216	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 147.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 140.8 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 210.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-31

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** S51/S53

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 31 - 01	127	157	X	< 10	X	X	SE-1	FTB	PASS
D S- 31 - 02	131	153		< 10			SE-1	FTB	PASS
D S- 31 - 03	129	148		< 10			SE-1	FTB	PASS
D S- 31 - 04	131	147		< 10			SE-1	FTB	PASS
D S- 31 - 05	133	149		< 10			SE-1	FTB	PASS
D S- 31 - 06	X	X	219	> 10	> 50	BRK	FTB	PASS	
D S- 31 - 07			215	> 10	> 50	BRK	FTB	PASS	
D S- 31 - 08			223	> 10	> 50	BRK	FTB	PASS	
D S- 31 - 09			217	> 10	> 50	BRK	FTB	PASS	
D S- 31 - 10			216	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 130.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 150.8 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 218.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-32

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: T16/S24

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 32 - 01	129	155	X	< 10	X	X	SE-1	FTB	PASS
D S- 32 - 02	133	163		< 10			SE-1	FTB	PASS
D S- 32 - 03	128	144		< 10			SE-1	FTB	PASS
D S- 32 - 04	135	160		< 10			SE-1	FTB	PASS
D S- 32 - 05	144	156		< 10			SE-1	FTB	PASS
D S- 32 - 06	X	X	199	> 10	> 50	BRK	FTB	PASS	
D S- 32 - 07			190	> 10	> 50	BRK	FTB	PASS	
D S- 32 - 08			193	> 10	> 50	BRK	FTB	PASS	
D S- 32 - 09			206	> 10	> 50	BRK	FTB	PASS	
D S- 32 - 10			201	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 133.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 155.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 197.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-33

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: T42/T43

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 33 - 01	152	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 33 - 02	157	137		< 10			SE-1	FTB	PASS
D S- 33 - 03	155	140		< 10			SE-1	FTB	PASS
D S- 33 - 04	159	136		< 10			SE-1	FTB	PASS
D S- 33 - 05	143	140		< 10			SE-1	FTB	PASS
D S- 33 - 06	X	X	204	> 10	> 50	BRK	FTB	PASS	
D S- 33 - 07			209	> 10	> 50	BRK	FTB	PASS	
D S- 33 - 08			203	> 10	> 50	BRK	FTB	PASS	
D S- 33 - 09			207	> 10	> 50	BRK	FTB	PASS	
D S- 33 - 10			204	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 153.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 138.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 205.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-34

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** T47/T48

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 34 - 01	140	136	X	< 10	X	X	SE-1	FTB	PASS
D S- 34 - 02	142	132		< 10			SE-1	FTB	PASS
D S- 34 - 03	147	130		< 10			SE-1	FTB	PASS
D S- 34 - 04	140	128		< 10			SE-1	FTB	PASS
D S- 34 - 05	135	129		< 10			SE-1	FTB	PASS
D S- 34 - 06	X	X	207	> 10	> 50	BRK	FTB	PASS	
D S- 34 - 07			202	> 10	> 50	BRK	FTB	PASS	
D S- 34 - 08			209	> 10	> 50	BRK	FTB	PASS	
D S- 34 - 09			208	> 10	> 50	BRK	FTB	PASS	
D S- 34 - 10			209	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 140.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 131.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 207.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-35

**Sample Date:** 3-11-08

**SEAM BETWEEN PANELS NO.:** T52/T54

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 35 - 01	155	147	X	< 10	X	X	SE-1	FTB	PASS
D S- 35 - 02	160	156		< 10			SE-1	FTB	PASS
D S- 35 - 03	166	150		< 10			SE-1	FTB	PASS
D S- 35 - 04	158	151		< 10			SE-1	FTB	PASS
D S- 35 - 05	155	157		< 10			SE-1	FTB	PASS
D S- 35 - 06	X	X	183	> 10	> 50	BRK	FTB	PASS	
D S- 35 - 07			180	> 10	> 50	BRK	FTB	PASS	
D S- 35 - 08			186	> 10	> 50	BRK	FTB	PASS	
D S- 35 - 09			177	> 10	> 50	BRK	FTB	PASS	
D S- 35 - 10			180	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 158.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 152.2 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 181.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-36

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: T57/T58

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 36 - 01	128	133	X	< 10	X	X	SE-1	FTB	PASS
D S- 36 - 02	125	141		< 10			SE-1	FTB	PASS
D S- 36 - 03	129	131		< 10			SE-1	FTB	PASS
D S- 36 - 04	120	129		< 10			SE-1	FTB	PASS
D S- 36 - 05	125	138		< 10			SE-1	FTB	PASS
D S- 36 - 06	X	X	207	> 10	> 50	BRK	FTB	PASS	
D S- 36 - 07			209	> 10	> 50	BRK	FTB	PASS	
D S- 36 - 08			201	> 10	> 50	BRK	FTB	PASS	
D S- 36 - 09			206	> 10	> 50	BRK	FTB	PASS	
D S- 36 - 10			205	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 125.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 134.4 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 205.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-37

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: T61/T62

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 37 - 01	140	128	X	< 10	X	X	SE-1	FTB	PASS
D S- 37 - 02	144	118		< 10			SE-1	FTB	PASS
D S- 37 - 03	148	117		< 10			SE-1	FTB	PASS
D S- 37 - 04	133	119		< 10			SE-1	FTB	PASS
D S- 37 - 05	145	123		< 10			SE-1	FTB	PASS
D S- 37 - 06	X	X	190	> 10	> 50	BRK	FTB	PASS	
D S- 37 - 07			185	> 10	> 50	BRK	FTB	PASS	
D S- 37 - 08			187	> 10	> 50	BRK	FTB	PASS	
D S- 37 - 09			190	> 10	> 50	BRK	FTB	PASS	
D S- 37 - 10			189	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 142.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 121.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 188.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-38

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** T66/T67

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 38 - 01	140	158	X	< 10	X	X	SE-1	FTB	PASS
D S- 38 - 02	136	144		< 10			SE-1	FTB	PASS
D S- 38 - 03	153	136		< 10			SE-1	FTB	PASS
D S- 38 - 04	129	139		< 10			SE-1	FTB	PASS
D S- 38 - 05	140	128		< 10			SE-1	FTB	PASS
D S- 38 - 06	X	X	185	> 10	> 50	BRK	FTB	PASS	
D S- 38 - 07			189	> 10	> 50	BRK	FTB	PASS	
D S- 38 - 08			190	> 10	> 50	BRK	FTB	PASS	
D S- 38 - 09			184	> 10	> 50	BRK	FTB	PASS	
D S- 38 - 10			187	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 139.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 141.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 187.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-39

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: S44/T45

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 39 - 01	144	138	X	< 10	X	X	SE-1	FTB	PASS
D S- 39 - 02	148	133		< 10			SE-1	FTB	PASS
D S- 39 - 03	151	144		< 10			SE-1	FTB	PASS
D S- 39 - 04	140	149		< 10			SE-1	FTB	PASS
D S- 39 - 05	153	145		< 10			SE-1	FTB	PASS
D S- 39 - 06	X	X	181	> 10	> 50	BRK	FTB	PASS	
D S- 39 - 07			179	> 10	> 50	BRK	FTB	PASS	
D S- 39 - 08			187	> 10	> 50	BRK	FTB	PASS	
D S- 39 - 09			189	> 10	> 50	BRK	FTB	PASS	
D S- 39 - 10			185	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 147.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 141.8 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 184.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-40

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: S54/S56

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 40 - 01	141	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 40 - 02	140	147		< 10			SE-1	FTB	PASS
D S- 40 - 03	130	143		< 10			SE-1	FTB	PASS
D S- 40 - 04	129	148		< 10			SE-1	FTB	PASS
D S- 40 - 05	128	145		< 10			SE-1	FTB	PASS
D S- 40 - 06	X	X	185	> 10	> 50	BRK	FTB	PASS	
D S- 40 - 07			189	> 10	> 50	BRK	FTB	PASS	
D S- 40 - 08			183	> 10	> 50	BRK	FTB	PASS	
D S- 40 - 09			193	> 10	> 50	BRK	FTB	PASS	
D S- 40 - 10			184	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 133.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 144.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 186.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-41

**Sample Date:** 3-14-08

**SEAM BETWEEN PANELS NO.:** T73/T74

**Testing Date:** 3-18-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 41 - 01	129	151	X	< 10	X	X	SE-1	FTB	PASS
D S- 41 - 02	140	149		< 10			SE-1	FTB	PASS
D S- 41 - 03	135	144		< 10			SE-1	FTB	PASS
D S- 41 - 04	139	138		< 10			SE-1	FTB	PASS
D S- 41 - 05	144	136		< 10			SE-1	FTB	PASS
D S- 41 - 06	X	X	180	> 10	> 50	BRK	FTB	PASS	
D S- 41 - 07			187	> 10	> 50	BRK	FTB	PASS	
D S- 41 - 08			183	> 10	> 50	BRK	FTB	PASS	
D S- 41 - 09			187	> 10	> 50	BRK	FTB	PASS	
D S- 41 - 10			189	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 137.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 143.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 185.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-42

Sample Date: 3-19-08

SEAM BETWEEN PANELS NO.: T76/T77

Testing Date: 3-19-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 42 - 01	138	138	X	< 10	X	X	SE-1	FTB	PASS
D S- 42 - 02	126	138		< 10			SE-1	FTB	PASS
D S- 42 - 03	132	148		< 10			SE-1	FTB	PASS
D S- 42 - 04	119	136		< 10			SE-1	FTB	PASS
D S- 42 - 05	118	142		< 10			SE-1	FTB	PASS
D S- 42 - 06	X	X	193	> 10	> 50	BRK	FTB	PASS	
D S- 42 - 07			193	> 10	> 50	BRK	FTB	PASS	
D S- 42 - 08			195	> 10	> 50	BRK	FTB	PASS	
D S- 42 - 09			191	> 10	> 50	BRK	FTB	PASS	
D S- 42 - 10			195	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 126.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 140.4 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 193.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-43

Sample Date: 3-19-08

SEAM BETWEEN PANELS NO.: T68/S55

Testing Date: 3-19-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 43 - 01	138	147	X	< 10	X	X	SE-1	FTB	PASS
D S- 43 - 02	146	150		< 10			SE-1	FTB	PASS
D S- 43 - 03	148	147		< 10			SE-1	FTB	PASS
D S- 43 - 04	154	150		< 10			SE-1	FTB	PASS
D S- 43 - 05	151	144		< 10			SE-1	FTB	PASS
D S- 43 - 06	X	X	216	> 10	> 50	BRK	FTB	PASS	
D S- 43 - 07			207	> 10	> 50	BRK	FTB	PASS	
D S- 43 - 08			211	> 10	> 50	BRK	FTB	PASS	
D S- 43 - 09			207	> 10	> 50	BRK	FTB	PASS	
D S- 43 - 10			209	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 147.4 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 147.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 210.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-44

Sample Date: 3-19-08

SEAM BETWEEN PANELS NO.: T83/T86

Testing Date: 3-19-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 44 - 01	146	146	X	< 10	X	X	SE-1	FTB	PASS
D S- 44 - 02	147	150		< 10			SE-1	FTB	PASS
D S- 44 - 03	147	157		< 10			SE-1	FTB	PASS
D S- 44 - 04	138	160		< 10			SE-1	FTB	PASS
D S- 44 - 05	151	160		< 10			SE-1	FTB	PASS
D S- 44 - 06	X	X	210	> 10	> 50	BRK	FTB	PASS	
D S- 44 - 07			201	> 10	> 50	BRK	FTB	PASS	
D S- 44 - 08			208	> 10	> 50	BRK	FTB	PASS	
D S- 44 - 09			198	> 10	> 50	BRK	FTB	PASS	
D S- 44 - 10			202	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 145.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 154.6 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 203.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-45

Sample Date: 3-19-08

SEAM BETWEEN PANELS NO.: T30/S49

Testing Date: 3-19-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 45 - 01	152	130	X	< 10	X	X	SE-1	FTB	PASS
D S- 45 - 02	135	149		< 10			SE-1	FTB	PASS
D S- 45 - 03	160	138		< 10			SE-1	FTB	PASS
D S- 45 - 04	143	134		< 10			SE-1	FTB	PASS
D S- 45 - 05	159	144		< 10			SE-1	FTB	PASS
D S- 45 - 06	X	X	174	> 10	> 50	BRK	FTB	PASS	
D S- 45 - 07			168	> 10	> 50	BRK	FTB	PASS	
D S- 45 - 08			186	> 10	> 50	BRK	FTB	PASS	
D S- 45 - 09			170	> 10	> 50	BRK	FTB	PASS	
D S- 45 - 10			167	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 149.8 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 139.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 173.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-46

Sample Date: 3-14-08

SEAM BETWEEN PANELS NO.: T83/R8

Testing Date: 3-18-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 46 - 01	105	---	X	< 10	X	X	SE-1	FTB	PASS
D S- 46 - 02	107	---		< 10			SE-1	FTB	PASS
D S- 46 - 03	101	---		< 10			SE-1	FTB	PASS
D S- 46 - 04	109	---		< 10			SE-1	FTB	PASS
D S- 46 - 05	103	---		< 10			SE-1	FTB	PASS
D S- 46 - 06	X	X	167	> 10	> 50	BRK	FTB	PASS	
D S- 46 - 07			171	> 10	> 50	BRK	FTB	PASS	
D S- 46 - 08			163	> 10	> 50	BRK	FTB	PASS	
D S- 46 - 09			165	> 10	> 50	BRK	FTB	PASS	
D S- 46 - 10			162	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 105.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 111 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 165.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-47

Sample Date: 3-20-08

SEAM BETWEEN PANELS NO.: C11/S14

Testing Date: 3-20-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 47 - 01	161	143	X	< 10	X	X	SE-1	FTB	PASS
D S- 47 - 02	158	141		< 10			SE-1	FTB	PASS
D S- 47 - 03	161	141		< 10			SE-1	FTB	PASS
D S- 47 - 04	171	157		< 10			SE-1	FTB	PASS
D S- 47 - 05	155	137		< 10			SE-1	FTB	PASS
D S- 47 - 06	X	X	187	> 10	> 50	BRK	FTB	PASS	
D S- 47 - 07			181	> 10	> 50	BRK	FTB	PASS	
D S- 47 - 08			188	> 10	> 50	BRK	FTB	PASS	
D S- 47 - 09			190	> 10	> 50	BRK	FTB	PASS	
D S- 47 - 10			191	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 161.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 143.8 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 187.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-48

Sample Date: 3-20-08

SEAM BETWEEN PANELS NO.: C11/T26

Testing Date: 3-20-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 48 - 01	147	161	X	< 10	X	X	SE-1	FTB	PASS
D S- 48 - 02	155	158		< 10			SE-1	FTB	PASS
D S- 48 - 03	157	147		< 10			SE-1	FTB	PASS
D S- 48 - 04	161	155		< 10			SE-1	FTB	PASS
D S- 48 - 05	161	150		< 10			SE-1	FTB	PASS
D S- 48 - 06	X	X	178	> 10	> 50	BRK	FTB	PASS	
D S- 48 - 07			175	> 10	> 50	BRK	FTB	PASS	
D S- 48 - 08			187	> 10	> 50	BRK	FTB	PASS	
D S- 48 - 09			188	> 10	> 50	BRK	FTB	PASS	
D S- 48 - 10			188	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 156.2 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 154.2 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 183.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-49

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S64/S63

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 49 - 01	154	176	X	< 10	X	X	SE-1	FTB	PASS
D S- 49 - 02	162	168		< 10			SE-1	FTB	PASS
D S- 49 - 03	152	174		< 10			SE-1	FTB	PASS
D S- 49 - 04	200	164		< 10			SE-1	FTB	PASS
D S- 49 - 05	160	178		< 10			SE-1	FTB	PASS
D S- 49 - 06	X	X	219	> 10	> 50	BRK	FTB	PASS	
D S- 49 - 07			219	> 10	> 50	BRK	FTB	PASS	
D S- 49 - 08			231	> 10	> 50	BRK	FTB	PASS	
D S- 49 - 09			232	> 10	> 50	BRK	FTB	PASS	
D S- 49 - 10			226	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 165.6 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 172.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 225.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-50

**Sample Date:** 3-26-08

**SEAM BETWEEN PANELS NO.:** S61/S1

**Testing Date:** 3-26-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 50 - 01	150	165	X	< 10	X	X	SE-1	FTB	PASS
D S- 50 - 02	140	160		< 10			SE-1	FTB	PASS
D S- 50 - 03	140	175		< 10			SE-1	FTB	PASS
D S- 50 - 04	135	170		< 10			SE-1	FTB	PASS
D S- 50 - 05	150	170		< 10			SE-1	FTB	PASS
D S- 50 - 06	X	X	211	> 10	> 50	BRK	FTB	PASS	
D S- 50 - 07			214	> 10	> 50	BRK	FTB	PASS	
D S- 50 - 08			220	> 10	> 50	BRK	FTB	PASS	
D S- 50 - 09			223	> 10	> 50	BRK	FTB	PASS	
D S- 50 - 10			213	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 143.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 168.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 216.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-51

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S64/S65

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 51 - 01	155	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 51 - 02	145	150		< 10			SE-1	FTB	PASS
D S- 51 - 03	155	145		< 10			SE-1	FTB	PASS
D S- 51 - 04	150	140		< 10			SE-1	FTB	PASS
D S- 51 - 05	145	140		< 10			SE-1	FTB	PASS
D S- 51 - 06	X	X	180	> 10	> 50	BRK	FTB	PASS	
D S- 51 - 07			181	> 10	> 50	BRK	FTB	PASS	
D S- 51 - 08			186	> 10	> 50	BRK	FTB	PASS	
D S- 51 - 09			184	> 10	> 50	BRK	FTB	PASS	
D S- 51 - 10			173	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 150.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 143.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 180.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-52

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S69/S71

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 52 - 01	180	160	X	< 10	X	X	SE-1	FTB	PASS
D S- 52 - 02	155	155		< 10			SE-1	FTB	PASS
D S- 52 - 03	180	170		< 10			SE-1	FTB	PASS
D S- 52 - 04	170	160		< 10			SE-1	FTB	PASS
D S- 52 - 05	175	165		< 10			SE-1	FTB	PASS
D S- 52 - 06	X	X	223	> 10	> 50	BRK	FTB	PASS	
D S- 52 - 07			222	> 10	> 50	BRK	FTB	PASS	
D S- 52 - 08			233	> 10	> 50	BRK	FTB	PASS	
D S- 52 - 09			226	> 10	> 50	BRK	FTB	PASS	
D S- 52 - 10			224	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 172.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 162.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 225.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-53

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S70/S72

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 53 - 01	175	180	X	< 10	X	X	SE-1	FTB	PASS
D S- 53 - 02	170	175		< 10			SE-1	FTB	PASS
D S- 53 - 03	185	180		< 10			SE-1	FTB	PASS
D S- 53 - 04	175	145		< 10			SE-1	FTB	PASS
D S- 53 - 05	175	150		< 10			SE-1	FTB	PASS
D S- 53 - 06	X	X	X	214	> 10	> 50	BRK	FTB	PASS
D S- 53 - 07				219	> 10	> 50	BRK	FTB	PASS
D S- 53 - 08				229	> 10	> 50	BRK	FTB	PASS
D S- 53 - 09				232	> 10	> 50	BRK	FTB	PASS
D S- 53 - 10				222	> 10	> 50	BRK	FTB	PASS
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 176.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 166.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 223.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-54 **Sample Date:** 3-26-08  
**SEAM BETWEEN PANELS NO.:** S74/S75 **Testing Date:** 3-26-08

**TEST METHOD:** ASTM D 6392-99 **Tensiometer:** LG-200  
**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip **Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 54 - 01	165	165	X	< 10	X	X	SE-1	FTB	PASS
D S- 54 - 02	160	175		< 10			SE-1	FTB	PASS
D S- 54 - 03	180	160		< 10			SE-1	FTB	PASS
D S- 54 - 04	175	175		< 10			SE-1	FTB	PASS
D S- 54 - 05	175	155		< 10			SE-1	FTB	PASS
D S- 54 - 06	X	X	220	> 10	> 50	BRK	FTB	PASS	
D S- 54 - 07			221	> 10	> 50	BRK	FTB	PASS	
D S- 54 - 08			228	> 10	> 50	BRK	FTB	PASS	
D S- 54 - 09			227	> 10	> 50	BRK	FTB	PASS	
D S- 54 - 10			235	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 171.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 166.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 226.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-55

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S75/S76

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 55 - 01	170	165	X	< 10	X	X	SE-1	FTB	PASS
D S- 55 - 02	155	155		< 10			SE-1	FTB	PASS
D S- 55 - 03	160	170		< 10			SE-1	FTB	PASS
D S- 55 - 04	150	150		< 10			SE-1	FTB	PASS
D S- 55 - 05	185	155		< 10			SE-1	FTB	PASS
D S- 55 - 06	X	X	X	221	> 10	> 50	BRK	FTB	PASS
D S- 55 - 07				224	> 10	> 50	BRK	FTB	PASS
D S- 55 - 08				231	> 10	> 50	BRK	FTB	PASS
D S- 55 - 09				227	> 10	> 50	BRK	FTB	PASS
D S- 55 - 10				237	> 10	> 50	BRK	FTB	PASS
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 164.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 159.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 228.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-56

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S77/S78

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 56 - 01	180	160	X	< 10	X	X	SE-1	FTB	PASS
D S- 56 - 02	175	150		< 10			SE-1	FTB	PASS
D S- 56 - 03	185	155		< 10			SE-1	FTB	PASS
D S- 56 - 04	170	145		< 10			SE-1	FTB	PASS
D S- 56 - 05	180	155		< 10			SE-1	FTB	PASS
D S- 56 - 06	X	X	228	> 10	> 50	BRK	FTB	PASS	
D S- 56 - 07			230	> 10	> 50	BRK	FTB	PASS	
D S- 56 - 08			237	> 10	> 50	BRK	FTB	PASS	
D S- 56 - 09			231	> 10	> 50	BRK	FTB	PASS	
D S- 56 - 10			242	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 178.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 153.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 233.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-57

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S80/S82

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 57 - 01	180	160	X	< 10	X	X	SE-1	FTB	PASS
D S- 57 - 02	175	165		< 10			SE-1	FTB	PASS
D S- 57 - 03	185	165		< 10			SE-1	FTB	PASS
D S- 57 - 04	170	155		< 10			SE-1	FTB	PASS
D S- 57 - 05	175	155		< 10			SE-1	FTB	PASS
D S- 57 - 06	X	X	228	> 10	> 50	BRK	FTB	PASS	
D S- 57 - 07			234	> 10	> 50	BRK	FTB	PASS	
D S- 57 - 08			238	> 10	> 50	BRK	FTB	PASS	
D S- 57 - 09			232	> 10	> 50	BRK	FTB	PASS	
D S- 57 - 10			237	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 177.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 160.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 233.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-58

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S82/S83

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 58 - 01	165	175	X	< 10	X	X	SE-1	FTB	PASS
D S- 58 - 02	155	150		< 10			SE-1	FTB	PASS
D S- 58 - 03	165	155		< 10			SE-1	FTB	PASS
D S- 58 - 04	170	150		< 10			SE-1	FTB	PASS
D S- 58 - 05	155	150		< 10			SE-1	FTB	PASS
D S- 58 - 06	X	X	X	228	> 10	> 50	BRK	FTB	PASS
D S- 58 - 07				235	> 10	> 50	BRK	FTB	PASS
D S- 58 - 08				241	> 10	> 50	BRK	FTB	PASS
D S- 58 - 09				234	> 10	> 50	BRK	FTB	PASS
D S- 58 - 10				244	> 10	> 50	BRK	FTB	PASS
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 162.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 156.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 236.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-59

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S85/S87

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 59 - 01	165	160	X	< 10	X	X	SE-1	FTB	PASS
D S- 59 - 02	180	165		< 10			SE-1	FTB	PASS
D S- 59 - 03	155	165		< 10			SE-1	FTB	PASS
D S- 59 - 04	145	155		< 10			SE-1	FTB	PASS
D S- 59 - 05	160	145		< 10			SE-1	FTB	PASS
D S- 59 - 06	X	X	221	> 10	> 50	BRK	FTB	PASS	
D S- 59 - 07			221	> 10	> 50	BRK	FTB	PASS	
D S- 59 - 08			228	> 10	> 50	BRK	FTB	PASS	
D S- 59 - 09			222	> 10	> 50	BRK	FTB	PASS	
D S- 59 - 10			228	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 161.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 158.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 224.0 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-60 **Sample Date:** 3-26-08  
**SEAM BETWEEN PANELS NO.:** S88/S90 **Testing Date:** 3-26-08

**TEST METHOD:** ASTM D 6392-99 **Tensiometer:** LG-200  
**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip **Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 60 - 01	185	165	X	< 10	X	X	SE-1	FTB	PASS
D S- 60 - 02	175	170		< 10			SE-1	FTB	PASS
D S- 60 - 03	170	170		< 10			SE-1	FTB	PASS
D S- 60 - 04	175	170		< 10			SE-1	FTB	PASS
D S- 60 - 05	175	165		< 10			SE-1	FTB	PASS
D S- 60 - 06	X	X	X	211	> 10	> 50	BRK	FTB	PASS
D S- 60 - 07				218	> 10	> 50	BRK	FTB	PASS
D S- 60 - 08				224	> 10	> 50	BRK	FTB	PASS
D S- 60 - 09				222	> 10	> 50	BRK	FTB	PASS
D S- 60 - 10				214	> 10	> 50	BRK	FTB	PASS
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 176.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 168.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 217.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-61

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S92/S93

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 61 - 01	180	165	X	< 10	X	X	SE-1	FTB	PASS
D S- 61 - 02	175	165		< 10			SE-1	FTB	PASS
D S- 61 - 03	170	160		< 10			SE-1	FTB	PASS
D S- 61 - 04	170	150		< 10			SE-1	FTB	PASS
D S- 61 - 05	170	160		< 10			SE-1	FTB	PASS
D S- 61 - 06	X	X	214	> 10	> 50	BRK	FTB	PASS	
D S- 61 - 07			213	> 10	> 50	BRK	FTB	PASS	
D S- 61 - 08			220	> 10	> 50	BRK	FTB	PASS	
D S- 61 - 09			213	> 10	> 50	BRK	FTB	PASS	
D S- 61 - 10			221	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 173.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 160.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 216.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-62

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S98/S99

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 62 - 01	145	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 62 - 02	155	175		< 10			SE-1	FTB	PASS
D S- 62 - 03	150	155		< 10			SE-1	FTB	PASS
D S- 62 - 04	150	165		< 10			SE-1	FTB	PASS
D S- 62 - 05	150	165		< 10			SE-1	FTB	PASS
D S- 62 - 06	X	X	213	> 10	> 50	BRK	FTB	PASS	
D S- 62 - 07			204	> 10	> 50	BRK	FTB	PASS	
D S- 62 - 08			219	> 10	> 50	BRK	FTB	PASS	
D S- 62 - 09			207	> 10	> 50	BRK	FTB	PASS	
D S- 62 - 10			216	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 150.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 160.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 211.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

**DESTRUCTIVE SAMPLE NO.:** DS-63

**Sample Date:** 3-26-08

**SEAM BETWEEN PANELS NO.:** S66/S68

**Testing Date:** 3-26-08

**TEST METHOD:** ASTM D 6392-99

**Tensiometer:** LG-200

**Serial Number:** 39182

**SPECIMEN CONFIGURATION:** 1-inch strip

**Calibration:** March 24, 2006

**STRAIN RATE:** 2 inches/minute

**MINIMUM PEEL & SHEAR VALUES:** Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

<b>TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING</b>									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 63 - 01	190	175	X	< 10	X	X	SE-1	FTB	PASS
D S- 63 - 02	185	170		< 10			SE-1	FTB	PASS
D S- 63 - 03	190	170		< 10			SE-1	FTB	PASS
D S- 63 - 04	175	160		< 10			SE-1	FTB	PASS
D S- 63 - 05	180	165		< 10			SE-1	FTB	PASS
D S- 63 - 06	X	X	171	> 10	> 50	BRK	FTB	PASS	
D S- 63 - 07			176	> 10	> 50	BRK	FTB	PASS	
D S- 63 - 08			191	> 10	> 50	BRK	FTB	PASS	
D S- 63 - 09			194	> 10	> 50	BRK	FTB	PASS	
D S- 63 - 10			184	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 184.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 168.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 183.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-64

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: S90/T87

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 64 - 01	175	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 64 - 02	180	180		< 10			SE-1	FTB	PASS
D S- 64 - 03	165	165		< 10			SE-1	FTB	PASS
D S- 64 - 04	155	175		< 10			SE-1	FTB	PASS
D S- 64 - 05	180	190		< 10			SE-1	FTB	PASS
D S- 64 - 06	X	X	205	> 10	> 50	BRK	FTB	PASS	
D S- 64 - 07			203	> 10	> 50	BRK	FTB	PASS	
D S- 64 - 08			206	> 10	> 50	BRK	FTB	PASS	
D S- 64 - 09			207	> 10	> 50	BRK	FTB	PASS	
D S- 64 - 10			211	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 171.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 170.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 206.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-65

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: T86/T91

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 65 - 01	170	145	X	< 10	X	X	SE-1	FTB	PASS
D S- 65 - 02	150	140		< 10			SE-1	FTB	PASS
D S- 65 - 03	140	140		< 10			SE-1	FTB	PASS
D S- 65 - 04	145	140		< 10			SE-1	FTB	PASS
D S- 65 - 05	145	145		< 10			SE-1	FTB	PASS
D S- 65 - 06	X	X	177	> 10	> 50	BRK	FTB	PASS	
D S- 65 - 07			179	> 10	> 50	BRK	FTB	PASS	
D S- 65 - 08			184	> 10	> 50	BRK	FTB	PASS	
D S- 65 - 09			178	> 10	> 50	BRK	FTB	PASS	
D S- 65 - 10			180	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 150.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 142.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 179.6 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-66

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: T97/T98

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 66 - 01	145	160	X	< 10	X	X	SE-1	FTB	PASS
D S- 66 - 02	140	150		< 10			SE-1	FTB	PASS
D S- 66 - 03	145	160		< 10			SE-1	FTB	PASS
D S- 66 - 04	135	155		< 10			SE-1	FTB	PASS
D S- 66 - 05	130	145		< 10			SE-1	FTB	PASS
D S- 66 - 06	X	X	197	> 10	> 50	BRK	FTB	PASS	
D S- 66 - 07			182	> 10	> 50	BRK	FTB	PASS	
D S- 66 - 08			185	> 10	> 50	BRK	FTB	PASS	
D S- 66 - 09			180	> 10	> 50	BRK	FTB	PASS	
D S- 66 - 10			178	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 139.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 154.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 184.4 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-67

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: C11/S88

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 67 - 01	145	145	X	< 10	X	X	SE-1	FTB	PASS
D S- 67 - 02	145	155		< 10			SE-1	FTB	PASS
D S- 67 - 03	145	150		< 10			SE-1	FTB	PASS
D S- 67 - 04	145	150		< 10			SE-1	FTB	PASS
D S- 67 - 05	155	140		< 10			SE-1	FTB	PASS
D S- 67 - 06	X	X	180	> 10	> 50	BRK	FTB	PASS	
D S- 67 - 07			181	> 10	> 50	BRK	FTB	PASS	
D S- 67 - 08			186	> 10	> 50	BRK	FTB	PASS	
D S- 67 - 09			184	> 10	> 50	BRK	FTB	PASS	
D S- 67 - 10			173	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 147.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 148.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 180.8 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**TABLE 7: QA DESTRUCTIVE SEAM STRENGTH TESTING**

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA**

BUNNELL-LAMMONS ENGINEERING, INC. PROJECT NO. J07-1001-58

DESTRUCTIVE SAMPLE NO.: DS-68

Sample Date: 3-26-08

SEAM BETWEEN PANELS NO.: C11/S67

Testing Date: 3-26-08

TEST METHOD: ASTM D 6392-99

Tensiometer: LG-200

Serial Number: 39182

SPECIMEN CONFIGURATION: 1-inch strip

Calibration: March 24, 2006

STRAIN RATE: 2 inches/minute

MINIMUM PEEL & SHEAR VALUES: Fusion Welds 90 ppi & 120 ppi  
Extrusion Welds 78 ppi & 120 ppi

TABLE 7 QA DESTRUCTIVE SEAM STRENGTH TESTING									
SAMPLE NUMBER	MAXIMUM TENSION (ppi)			PEEL INCURSION (%)	ELONGATION (%)		LOCUS OF BREAK **	FTB or NON-FTB	RESULTS PASS/FAIL
	PEEL TEST*		SHEAR TEST		@ YIELD	@ BREAK			
	Inside Track	Outside Track							
D S- 68 - 01	150	140	X	< 10	X	X	SE-1	FTB	PASS
D S- 68 - 02	160	160		< 10			SE-1	FTB	PASS
D S- 68 - 03	155	155		< 10			SE-1	FTB	PASS
D S- 68 - 04	145	145		< 10			SE-1	FTB	PASS
D S- 68 - 05	145	145		< 10			SE-1	FTB	PASS
D S- 68 - 06	X	X	226	> 10	> 50	BRK	FTB	PASS	
D S- 68 - 07			222	> 10	> 50	BRK	FTB	PASS	
D S- 68 - 08			233	> 10	> 50	BRK	FTB	PASS	
D S- 68 - 09			226	> 10	> 50	BRK	FTB	PASS	
D S- 68 - 10			224	> 10	> 50	BRK	FTB	PASS	
				≤ 10%	≥ 10%	≥ 50%			

Average of Peel Test Values, Inside Track: 151.0 ppi

Tested by: JOHN MATHEW

Average of Peel Test Values, Outside Track: 149.0 ppi

Checked by: JEFF HELVEY, P.E.

Average of Shear Test Values: 226.2 ppi

Reviewed by: JEFF HELVEY

\* Extrusion welds have only one side tested in peel.

\*\* Break code referenced to ASTM D 6392-99

**APPENDIX H**

**MATERIAL SUBMITTALS**



**BUNNELL-LAMMONS ENGINEERING, INC.**

GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

## PROJECT MEMO

**EAST CAROLINA REGIONAL MSW LANDFILL  
CONSTRUCTION OF CELL NO. 12  
BERTIE COUNTY, NORTH CAROLINA  
BLE Project No. J07-1001-58**

**To:** Mr. Hal Newberry, P.E.  
Mr. Steve Nichting

**Copy:** Mr. Bill Hodges, P. E.  
Mr. Ray Hoffman, P.E.  
Mr. Dan Bunnell, P.E.  
Mr. Justin Goss  
Mr. Ted Stiles

**From:** Mr. Jeff Helvey, P.E. 

**Date:** January 4, 2008

**Subject:** **Recommendation for Acceptance of Propex 801 Drainage Geotextile.**

---

We have reviewed CQA (third party) and CQC (manufacturer) conformance test results for the Propex 801 minimum 6-osy drainage geotextile proposed for use in the floor of Cell No. 12 at the East Carolina Regional MSW Landfill. The test results and frequencies for all 109 rolls meet the project CQA and CQC requirements. We therefore recommend acceptance of all 109 rolls of Propex 801 minimum 6-osy drainage geotextile for use in the construction of Cell No. 12 at the East Carolina Regional MSW Landfill.

attachments



Colloid Lining Technologies

12/10/2007

Kathy Brazeau  
BOL: 80420499 PO: o-113-59613

This certificate indicates that 801 is a nonwoven polypropylene geotextile, supplied by Propex and will meet the following Minimum Average Roll Values (MARV) when tested in accordance with the ASTM test methods listed below, unless otherwise stated. This product utilizes carbon black as a UV inhibitor.

PROPERTY	TEST METHOD	UNITS	ENGLISH	METRIC
Tensile Strength	ASTM D4632	lbs (N)	205	912
Elongation	ASTM D4632	%	50	50
Puncture	ASTM D4833	lbs (N)	110	490
Mullen Burst	ASTM D3786	psi (kPa)	350	2413
Trapezoidal Tear	ASTM D4533	lbs (N)	85	378
UV Resistance (min)	ASTM D4355	%	70	70
AOS (max)	ASTM D4751	US Std. Sieve (mm)	80	0.180
Permittivity	ASTM D4491	1/sec	1.50	1.50
Water Flow Rate	ASTM D4491	gpm/ft <sup>2</sup> (l/min/m <sup>2</sup> )	110.0	4482
CBR	ASTM D6241	lbs (N)	525.0	2336

Michael W. Simpson  
Quality Manager  
Ringgold Quality Lab

This publication should not be construed as engineering advice. While information contained in this publication is accurate to the best of our knowledge, Propex does not warrant its accuracy or completeness. The ultimate customer and user of the products should assume sole responsibility for the final determination of the suitability of the information and the products for the contemplated and actual use. The only warranty made by Propex for its products is set forth in our product data sheet for the product, or such other written warranty as may be agreed by Propex and individual customers. Propex specifically disclaims all other warranties, express or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, or arising from provision of samples, a course of dealing or usage of trade.

# PROPEX®

BOL:

80420418

Certificate of Analysis

≥ 95.00 lbs

≥ 6.0 oz/yd

HL#/Rolls Shipped	Style	Production Order	Units ASTM Test	Mass/Unit Area		Thickness	Tensile		Elongation		Puncture	Burst	Trap Tear		AOS	Permittivity	Permeability	Water Flow	CBR
				oz/yd²	D5261 (ok)		MD	XMD	lbs	D4632			MD	XMD					
1	2009521497	801	27621	8.0	80	278	212	115	107	148	444	183	117	0.18	1.90	0.460	139.0	660	
2	2009521498	801	27621	8.0	80	278	212	115	107	148	444	183	117	0.18	1.90	0.460	139.0	660	
3	2009521499	801	27621	8.0	80	278	212	115	107	148	444	183	117	0.18	1.90	0.460	139.0	660	
4	2009521500	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
5	2009521501	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
6	2009521502	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
7	2009521503	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
8	2009521504	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
9	2009521505	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
10	2009521506	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
11	2009521507	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
12	2009521508	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
13	2009521509	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
14	2009521511	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
15	2009521512	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
16	2009521513	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
17	2009521514	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
18	2009521515	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
19	2009521516	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
20	2009521517	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
21	2009521518	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
22	2009521769	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
23	2009521770	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
24	2009521771	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	
25	2009521773	801	27621	7.3	75	258	213	101	121	151	430	134	116	0.18	1.90	0.460	139.0	660	

2

2



*Stan O. Hart*

Certificate of Analysis

80420418

BOL:

HU#/Rolls Shipped	Style	Production Order	Mass/Unit Area	Thickness	Tensile		Elongation		Puncture	Burst	Trap Tear		Permittivity	Permeability	Water Flow	CBR	
					MD	XMD	MD	XMD			MD	XMD					MD
		Units	oz/yd <sup>2</sup>	mils	lbs	lbs	%	%	lbs	psi	lbs	lbs	1/sec	cm/sec	gpm/ft <sup>2</sup>	lb	
		ASTM Teet	D5261	D5199	D4632	D4632	D4632	D4632	D4833	D3786	D4533	D4751	D491	D4491	D4491	D6241	
26	2009521774	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
27	2009521775	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
28	2009521776	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
29	2009521777	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
30	2009521778	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
31	2009521779	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
32	2009521780	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
33	2009521781	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
34	2009521783	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
35	2009521784	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
36	2009521785	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
37	2009521786	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
38	2009521788	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
39	2009521789	801	7.3	75	258	213	101	121	151	430	134	116	1.90	0.460	139.0	660	
40	2009521790	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
41	2009521791	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
42	2009521792	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
43	2009521793	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
44	2009521794	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
45	2009521795	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
46	2009521796	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
47	2009521799	801	7.4	75	255	216	97	113	161	424	171	117	1.90	0.460	139.0	660	
48	2009521800	801	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660	
49	2009521801	801	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660	
50	2009521802	801	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660	



*Stan O. Hunt*

BOL:

80420418

Certificate of Analysis

HU#/Rolls Shipped	Style	Production Order	Mass/Unit Area		Thickness	Tensile		Elongation		Puncture	Burst	Trap Tear		Permittivity	Permeability	Water Flow	CBR
			oz/yd <sup>2</sup>	D5261		mils	MD	XMD	lbs			D4632	MD				
51	2009521803	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
52	2009521804	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
53	2009521805	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
54	2009521806	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
55	2009521807	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
56	2009521809	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
57	2009521810	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
58	2009521811	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
59	2009521812	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
60	2009521814	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
61	2009521815	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
62	2009521816	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
63	2009521817	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
64	2009521819	801	27621	7.4	75	255	216	97	113	161	424	171	117	2.10	0.440	155.0	660
65	2009521821	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
66	2009521822	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
67	2009521824	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
68	2009521825	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
69	2009521826	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
70	2009521827	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
71	2009521828	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
72	2009521829	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
73	2009521830	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
74	2009521831	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632
75	2009521832	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632



BOL:

80420418

Certificate of Analysis

*Handwritten signature*

HU#/Rolls Shipped	Style	Production Order	Mass/Unit Area	Thickness		Tensile		Elongation		Puncture	Burst	Trap Tear		Permittivity	Permeability	Water Flow	CBR	
				mils	D5199	MD	XMD	lbs	D4632			MD	XMD					lbs
76	2009521833	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
77	2009521834	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
78	2009521835	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
79	2009521836	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
80	2009521837	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
81	2009521838	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
82	2009521839	801	27621	7.5	79	254	210	98	113	129	432	157	108	2.10	0.440	155.0	632	
83	2009521840	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
84	2009521841	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
85	2009521842	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
86	2009521843	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
87	2009521844	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
88	2009521845	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
89	2009521847	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
90	2009521848	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
91	2009521850	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
92	2009521852	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
93	2009521853	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
94	2009521854	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
95	2009521855	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
96	2009521856	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
97	2009521857	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
98	2009521858	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
99	2009521859	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	
100	2009521860	801	27621	7.4	80	255	216	92	117	159	434	166	130	2.10	0.440	155.0	632	



*Stan O'Rourke*

**Certificate of Analysis**

**80420418**

**BOL:**

HU#/Rolls Shipped	Style	Production Order	Mass/Unit Area	Thickness		Tensile		Elongation		Puncture		Burst		Trap Tear		AOS	Permittivity	Permeability	Water Flow	CBR
				mils	D5199	MD	XMD	lbs	XMD	MD	XMD	MD	lbs	MD	lbs					
10/	2009521862	801	27621	7.4	80	255	216	92	117	159	434	166	130	0.18	2.10	0.440	155.0	632		
10/2	2009521863	801	27621	7.4	80	255	216	92	117	159	434	166	130	0.18	2.10	0.440	155.0	632		

1. Data listed above was determined in accordance with standard test methods, frequencies and procedures defined internally by plant and product type.

2. Rolls tested on this shipment are identified with an asterisk(\*).

3. HU# is handling unit and is terminology for roll number and "production order" equates to lot number. Our enterprise resource planning system generates sequential handling unit and production order designations independent of the manufacturing facility producing the product. Therefore, handling unit numbers may not be in sequential order within a production order.

Propex Inc., 6025 Lee Hwy, Suite 425, PO Box 22788, Chattanooga, TN 37422



*Steve O'Leary*

Certificate of Analysis

80420499

BOL:

HU#/Rolls Shipped	Style	Production Order	Units	Mass/Unit Area	Thickness		Tensile		Elongation		Puncture	Burst		Trap Tear		AOS	Permittivity	Permeability	Water Flow	CBR
					mils	D5199	MD	XMD	lbs	D4632		MD	XMD	psi	D3786					
103	2009521797	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		
104	2009521798	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		
105	2009521813	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		
106	2009521818	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		
107	2009521820	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		
108	2009521823	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		
109	2009521861	801	27621	7.5	79	254	210	98	113	129	432	157	108	0.18	2.10	0.440	155.0	632		

1. Data listed above was determined in accordance with standard test methods, frequencies and procedures defined internally by plant and product type.

2. Rolls tested on this shipment are identified with an asterisk(\*).

3. HU# is handling unit and is terminology for roll number and "production order" equates to lot number. Our enterprise resource planning system generates sequential handling unit and production order designations independent of the manufacturing facility producing the product. Therefore, handling unit numbers may not be in sequential order within a production order.

Propex Inc., 6025 Lee Hwy, Suite 425, PO Box 22788, Chattanooga, TN 37422

REQ'D : 2 PUNCTURE RESISTANCE. 5 MASS / UNIT AREA  
PERFORMED : 6 TESTS EACH PROPERTY

**TABLE 1.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521499  
 Material Description: Non-woven Geotextile

QC'd By:   
 PGL Job No.: G071529  
 PGL Control No.: 40510

METHOD DESCRIPTION	SPECIMENS										Proj. Specs.			
	1	2	3	4	5	6	7	8	9	10		Avg.	Std. Dev.	Min.
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	8.4	8.3	7.0	6.8	7.2						7.6	0.8	6.3	8.4
ASTM D4833 Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.</i>	147	150	141	140	155	161	158	130	168	175	155	12	130	175



**TABLE 2.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521517  
 Material Description: Non-woven Geotextile

QC'd By: *[Signature]*  
 PGL Job No.: G071529  
 PGL Control No.: 40511

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min.	Max.	Proj. Specs
	1	2	3	4	5	6	7	8	9	10					
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	8.4	6.4	8.3	8.2	6.9						7.7	0.9	6.4	8.4	
ASTM D4833 Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.</i>	165	170	180	155	149	160	155	157	159	161	162	9	149	180	
	159	161	159	162	180										



**TABLE 3.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

QC'd By: *[Signature]*  
 PGL Job No.: G071529  
 PGL Control No.: 40512

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521781  
 Material Description: Non-woven Geotextile

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min.	Max.	Proj. Specs.
	1	2	3	4	5	6	7	8	9	10					
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	6.9	7.0	8.7	7.0	8.2						7.6	0.9	5.9	9.7	
ASTM D4833 Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.</i>	149	161	170	171	178	181	171	163	159	161	165	8	149	181	
	167	160	161	159	161										



**TABLE 4.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521793  
 Material Description: Non-woven Geotextile

QC'd By: *SM*  
 PGL Job No.: G071529  
 PGL Control No.: 40513

METHOD DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min.	Max.	Proj. Specs
	1	2	3	4	5	6	7	8	9	10					
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	7.4	8.4	8.3	8.4	6.8						7.9	0.7	6.8	8.4	
ASTM D4833 Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.</i>	159	161	160	180	178	171	169	171	161	160	165	7	159	180	



**TABLE 5.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521820  
 Material Description: Non-woven Geotextile

QC'd By:   
 PGL Job No.: G071529  
 PGL Control No.: 40514

METHOD DESCRIPTION	SPECIMENS										Proj. Specs.			
	1	2	3	4	5	6	7	8	9	10		Avg.	Std. Dev.	Min.
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	8.4	6.2	7.0	6.9	7.0						7.5	0.7	6.9	8.4
ASTM D4833 Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.</i>	159	161	159	161	159	162	159	162	159	162	163	6	159	177
	177	171	170	171	160									



**TABLE 6.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521863  
 Material Description: Non-woven Geotextile

QC'd By:   
 PGL Job No.: G071529  
 PGL Control No.: 40515

METHOD	DESCRIPTION	SPECIMENS										Avg.	Std. Dev.	Min.	Max.	Proj. Specs
		1	2	3	4	5	6	7	8	9	10					
ASTM D5261	Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	7.0	8.5	6.9	8.7	8.5						7.9	0.9	6.9	8.7	
ASTM D4833	Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.</i>	158	154	160	161	170	171	188	175	161	159	164	9	154	188	
		161	159	161	160	162										



**TABLE 7.**  
**MATERIAL PROPERTIES**  
**CLIENT: BUNNELL-LAMMONS**  
**PROJECT: East Carolina Cell 12**

Date Received: 12/13/2007  
 Date Reported: 12/18/2007  
 Client Sample ID: R#2009521801  
 Material Description: Non-woven Geotextile

QC'd By:   
 PGL Job No.: G071529  
 PGL Control No.: 40516

METHOD DESCRIPTION	SPECIMENS										Proj. Specs			
	1	2	3	4	5	6	7	8	9	10		Avg.	Std. Dev.	Min.
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> ) Test Specimen Size: 4" x 8"	7.8	8.4	7.0	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.0	0.6	7.0	8.4
ASTM D4833 Puncture Resistance (lbs) Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens extended to or beyond the outer edges of the clamping plates.	175	180	177	165	171	159	160	141	150	151	158	13	141	180

# PLASTIC FUSION FABRICATORS, INC.

3455 Stanwood Boulevard.  
Huntsville, Alabama 35811  
Phone: (256) 852-0378  
Fax: (256) 852-0388

HODGES, HARBIN, NEWBERRY & TRIBBLE, INC. APPROVED AS NOTED BY <u>HCH</u> DATE <u>11/28/07</u>
--

## Submittals

To

**R. B. Baker Construction Co.**  
**100 Morgan Industrial Blvd.**  
**Garden City, GA. 31408**  
Attn: Scott Newman

## HDPE PIPE SYSTEM

For

**EAST CAROLINA REGIONAL MSWLF**  
**CELL NO. 12**  
**1922 REPUBLICAN ROAD**  
**BERTIE COUNTY**  
**AULANDER, NC. 27805**

**PFF Job #7515**

**PFF Project Manager: Leif Martin**  
**Direct Phone: (256)746-1257**  
**Email: [lmartin@plasticfusion.com](mailto:lmartin@plasticfusion.com)**



**WE SOLVE CONTAINMENT PROBLEMS !**

**THIS SECTION RESERVED FOR:**

***PIPE DATA***

**PolyPipe<sup>®</sup> EHMW PE3408/PE3608 Pipe**

**Extra High Molecular Weight (EHMW) High Density Polyethylene for use in industrial applications such as underground fire mains, mining, landfill, water reclamation or sewer.**

➤ *Other dimensional standards or custom requirements available.*

TYPICAL PHYSICAL PROPERTIES			
PROPERTY	ASTM TEST METHOD	*NOMINAL VALUES	
		SI UNITS	ENGLISH UNITS
Density, Natural	D1505	0.946 gm/cc	--
Density, Black	D1505	0.955 gm/cc	--
Melt Index (190°C/2.16 kg)	D1238	0.07 gm/10 min.	--
Flow Rate (190°C/21.6 kg)	D1238	8.5 gm/10 min.	--
Tensile Strength @Ultimate	D638	34.5 MPa	5,000 psi
Tensile Strength @ Yield	D638	24.1 MPa	3,500 psi
Ultimate Elongation	D638	>800%	>800%
Flexural Modulus	D790	938 MPa	136,000 psi
2% Secant			
Environmental Stress Crack Resistance (ESCR)			
F <sub>0</sub> , Condition C	D1693	>10,000 hrs.	>10,000 hrs.
PENT	F1473	>100 hrs.	>100 hrs.
Brittleness Temperature	D746	<-117°C	<-180°F
Hardness, Shore D	D2240	64	64
Vicat Softening Temperature	D1525	124°C	255°F
Izod Impact Strength (Notched)	D256	0.37 KJ/m	7 ft - lb/in
Volume Resistivity	D991	>10 <sup>15</sup> ohm-cm	--
Thermal Expansion Coefficient		2x10 <sup>-4</sup> cm/cm/°C	1.0x10 <sup>-4</sup> in/in/°F
CELL CLASSIFICATION:	D3350	345464C ✓	Grade PE36
MATERIAL CLASSIFICATION:	D1248	Type III Category 5	Class C
PPI HYDROSTATIC DESIGN BASIS (HDB)	D2837	11.0 MPa @ 23°C	1,600 psi @ 73.4°F
<i>(As listed in PPI TR-4)</i>		5.5 MPa @ 60°C	800 psi @ 140°F
PPI HYDROSTATIC DESIGN STRESS (HDS)		5.5 MPa @ 23°C	800 psi @ 73.4°F
<i>(As established by the Hydrostatic Stress Board (HSB) of the Plastics Pipe Institute (PPI))</i>			

\*Nominal values are intended to be guides only, and not as specification limit.

**PolyPipe, Inc.**

2406 N. I-35 | P.O. Box 390 | Gainesville, TX 76241  
 Phone 940.665.1721 | 800.433.5632 | Facsimile 940.668.8612  
 Sales Facsimile 940.668.2704 | [www.polypipeinc.com](http://www.polypipeinc.com)

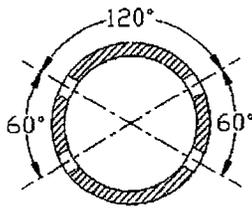
**POLYPIPE® EHMW Pipe**  
Pipe Data and Pressure Ratings – IPS

Pressure Rating		Class 265 DR7		Class 260 DR9		Class 160 DR11		Class 130 DR13.5		Class 100 DR17		Class 80 DR21		Class 65 DR26		Class 50 DR37.5	
Nominal Pipe Size	OD Size, inches	Min. Wall, inches	Weight, lbs/ft														
1/2"	0.840	0.120	0.12	0.093	0.10	0.076	0.08	---	---	---	---	---	---	---	---	---	---
3/4"	1.050	0.150	0.18	0.117	0.15	0.095	0.13	---	---	---	---	---	---	---	---	---	---
1"	1.315	0.188	0.29	0.146	0.23	0.120	0.20	---	---	---	---	---	---	---	---	---	---
1 1/4"	1.660	0.237	0.46	0.184	0.37	0.151	0.31	0.123	0.26	---	---	---	---	---	---	---	---
1 1/2"	1.900	0.271	0.60	0.211	0.49	0.173	0.41	0.141	0.34	---	---	---	---	---	---	---	---
2"	2.375	0.339	0.94	0.264	0.76	0.216	0.64	0.176	0.53	---	---	---	---	---	---	---	---
3"	3.500	0.500	2.05	0.389	1.66	0.318	1.39	0.259	1.15	0.140	0.43	---	---	---	---	---	---
4"	4.500	0.643	3.38	0.500	2.74	0.409	2.29	0.333	1.91	0.206	0.93	---	---	---	---	---	---
5"	5.375	0.768	4.83	0.597	3.91	0.489	3.27	0.398	2.72	0.265	1.26	0.167	0.76	0.135	0.62	0.138	0.83
5"	5.563	0.795	5.17	0.618	4.18	0.506	3.51	0.412	2.91	0.316	1.54	0.214	1.26	0.173	1.03	0.165	1.19
6"	6.625	0.946	7.34	0.736	5.93	0.602	4.97	0.491	4.13	0.327	2.20	0.256	1.80	0.207	1.47	0.171	1.27
7"	7.125	1.018	8.49	0.792	6.86	0.648	5.75	0.528	4.78	0.390	3.34	0.315	2.74	0.255	2.23	0.204	1.80
8"	8.625	1.232	12.43	0.958	10.05	0.784	8.43	0.639	7.00	0.419	3.86	0.339	3.17	0.274	2.58	0.219	2.08
10"	10.750	1.536	19.31	1.194	15.62	0.977	13.09	0.796	10.88	0.507	5.66	0.411	4.64	0.332	3.78	0.265	3.05
12"	12.750	1.821	27.17	1.417	21.97	1.159	18.41	0.944	15.30	0.632	8.79	0.512	7.20	0.413	5.88	0.331	4.74
14"	14.00	2.000	32.76	1.556	26.49	1.273	22.20	1.037	18.45	0.750	12.36	0.607	10.13	0.490	8.27	0.392	6.67
16"	16.00	2.286	42.79	1.778	34.60	1.455	28.99	1.185	24.09	0.824	14.91	0.667	12.22	0.538	9.97	0.431	8.04
18"	18.00	2.571	54.15	2.000	43.79	1.636	36.70	1.333	30.49	0.941	19.47	0.762	15.96	0.615	13.02	0.492	10.51
20"	20.00	2.857	66.85	2.222	54.06	1.818	45.30	1.481	37.64	1.059	24.64	0.857	20.20	0.692	16.48	0.554	13.30
22"	22.00	---	---	2.444	65.41	2.000	54.82	1.630	45.55	1.176	30.42	0.952	24.94	0.769	20.35	0.615	16.42
24"	24.00	---	---	2.667	77.85	2.182	65.24	1.778	54.21	1.294	36.81	1.048	30.17	0.846	24.62	0.677	19.86
28"	28.00	---	---	---	---	2.545	88.80	2.074	73.78	1.412	43.80	1.143	35.99	0.923	29.30	0.738	23.64
30"	30.00	---	---	---	---	2.727	101.93	2.222	84.70	1.765	68.44	1.429	56.11	1.154	45.78	0.862	32.17
32"	32.00	---	---	---	---	---	---	2.370	96.37	1.882	77.87	1.524	63.84	1.231	52.09	0.985	42.02
36"	36.00	---	---	---	---	---	---	---	121.96	2.118	98.55	1.714	80.79	1.385	65.92	1.108	53.19
42"	42.00	---	---	---	---	3.273	146.78	2.667	---	2.471	134.14	2.000	109.97	1.615	89.73	1.292	72.39
48"	48.00	---	---	---	---	---	---	---	---	---	---	2.286	143.63	1.846	117.19	1.477	94.55
54"	54.00	---	---	---	---	---	---	---	---	---	---	2.571	181.78	2.077	148.32	1.662	119.67
63"	63.00	---	---	---	---	---	---	---	---	---	---	3.000	247.42	2.423	201.89	1.938	162.88
65"	65.00	---	---	---	---	---	---	---	---	---	---	3.095	263.38	2.500	214.91	2.000	173.39

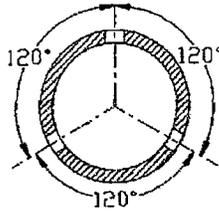
\*See notes on Page 3 for product information and pressure rating information.

# POLYPIPE® PERFORATED PIPE

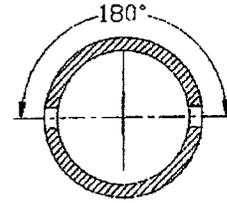
# PolyPipe®



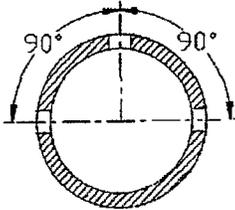
**STYLE A**



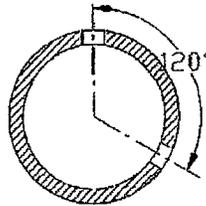
**STYLE B**



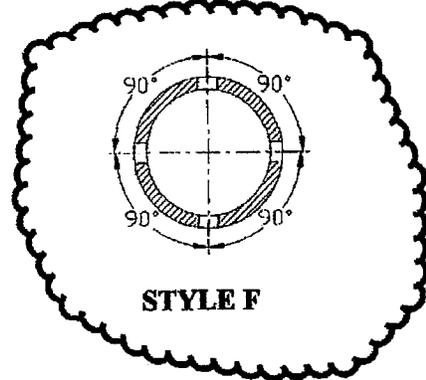
**STYLE C**



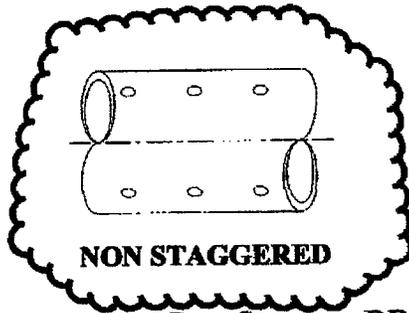
**STYLE D**



**STYLE E**

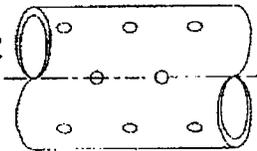


**STYLE F**



**NON STAGGERED**

*3/8" DIAMETER HOLES*  
*3" C-C SPACING*



**STAGGERED**

**PIPE SIZE AND DR PERFORATION CAPABILITIES\***

OD Nominal	Dimension Ratio							
	7	9	11	13.5	17	21	26	32.5
4								
5								
6								
7								
8								
10								
12								

★ *Shaded sizes are available. Hole sizes may vary from 1/4" to 5/8" diameter. Plant capabilities should be verified prior to ordering. Contact us if your perforation pattern is not shown.*

**PolyPipe, Inc.**

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**THIS SECTION RESERVED FOR:  
FITTING DATA**

*APPROVAL CONDITIONS:*

- 1. THE SDR OF PREFABRICATED FITTINGS SHALL MATCH THE SDR OF THE PIPE FOR WHICH THEY ARE PROPOSED FOR USE.*
- 2. ALL BENDS ON GRAVITY LEACHATE PIPES SHALL BE FABRICATED WITH LONG RADII TO ALLOW CAMERA ACCESS AFTER CONSTRUCTION IS COMPLETE.*



## **Tee Design Information and Branch Outlet End Options**

The linetee is a pipe component (fitting) that has a single branch outlet pipe equal in diameter to that of the main. The reducing-tee's branch outlet is of a diameter less than that of the main. Each tee side-outlet branch is at right angles (90 degrees) to the main.

Molded tees are fully pressure rated. Unreinforced fabricated tees have a reduced WPR, based solely on geometry. Three-piece mitered tees are usually "externally" reinforced to recapture some of the derating due to the hole in the main; this is accomplished by using the next lower DR (heavier wall) pipe. Reducing-tees are reinforced using massive branch saddles, such that the branch reinforcement surrounding the hole offsets the loss of "hoop" due to the hole. Reducing-tees made with the massive branch-saddle are fully pressure rated. The branch saddle reinforcement mass and its placement are calculated per ASME B31.3, Appendix H, Paragraph #304.3.3.

**Tee Outlet End Options** are: butt-end, flanged and MJ-anchor. Tees larger than 18" diameter should (strongly recommended) be shipped with flanged or MJ-anchor ends to facilitate mechanical assembly in the field without imposing undue lifting stress or strain on the fitting as it is positioned in the trench and connected to the pipe-run. Long runs of pipe (fused to the Tee) lifted / lowered into the trench can place undue stress/strain on the tee fitting

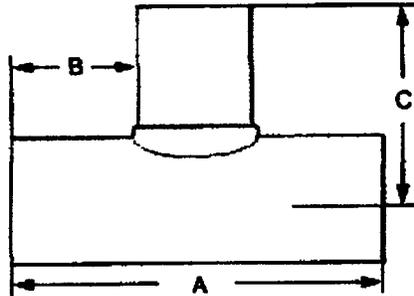
For a tee to achieve full pressure rating it must pass a quick burst test equal to that of the pipe. (attach a length of pipe equal to approx. 6 pipe diameters and then perform an ASTM D1599 quick-burst test) when the fitting survives and the attached pipe bursts, the fitting is as strong or stronger than the pipe. Tees with insufficient reinforcement will rupture before the attached pipe. Tees that survive the quick burst test have a safety factor and stress longevity equal to that of the pipe.

Derating or rerating of a tee WPR is a function of geometry and stress intensification factors at the hole in the main. Please refer to the engineering information presented earlier in the catalog section on Branch-Saddles.

# INDEPENDENT PIPE PRODUCTS



"BETTER BY DESIGN"®



## IPS Branch Saddle Reducing Tee Full Pressure Rated (Dimensions in Inches)

IPS Size	A	B	C	DR	Working Pressure	Weight (lbs)
4 x 2	18.0	7.2	11.3	11	160	5
6 x 2	18.0	7.2	12.3	11	160	12
8 x 2	18.0	7.2	13.3	11	160	19
10 x 2	18.0	7.2	14.4	11	160	28
12 x 2	20.0	6.2	15.4	11	160	39
4 x 3	18.0	6.7	12.3	11	160	6
6 x 3	18.0	6.7	13.3	11	160	12
8 x 4	19.0	6.2	13.3	11	160	13
8 x 4	19.0	6.2	14.3	11	160	20
10 x 4	19.0	6.2	15.4	11	160	29
12 x 4	23.0	6.2	16.4	11	160	41
8 x 6	21.0	6.2	14.3	11	160	26
10 x 6	21.0	6.2	15.4	11	160	35
12 x 6	24.0	7.7	16.4	11	160	46
14 x 6	24.0	7.7	17.0	11	160	63
16 x 6	29.0	10.2	18.0	11	160	96
10 x 8	24.0	6.2	24.4	11	160	44
12 x 8	28.0	6.2	25.4	11	160	73
12 x 10	30.0	6.6	26.4	11	160	85
14 x 10	30.0	6.6	27.0	11	160	95
16 x 10	34.0	10.8	28.0	11	160	116
14 x 12	32.0	6.5	29.0	11	160	117
16 x 12	36.0	10.5	30.0	11	160	138

Fully pressure rated reducing tees are available with outlet sizes 3/4" to 24" IPS.

Other sizes and DR's not listed are available - Call For Quick Quote

Sizes 24" and smaller meet AWWA C906 fitting requirements, sizes 26" and larger are quoted per fitting.

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Fax (800) 499-7124

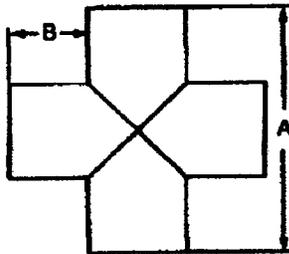
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# INDEPENDENT PIPE PRODUCTS



"BETTER BY DESIGN"<sup>®</sup>



## Fabricated Line Cross - IPS

(Dimensions in Inches)

IPS Size	A	B	SDR	WPR (psi)	Weight (lbs)
2"	9.0	3.3	11	160	2
3"	10.3	3.4	11	160	3
4"	16.5	6.0	7	200	10
			9	160	8
			11	128	7
6"	18.6	6.0	7	200	22
			9	160	18
			11	128	16
8"	24.6	8.0	7	200	50
			9	160	41
			11	128	34
10"	26.8	8.0	7	200	83
			9	160	67
			11	128	55
			17	80	38
12"	28.8	8.0	7	200	123
			9	160	99
			11	128	84
			17	80	56
14"	32.0	9.0	7	200	165
			9	160	132
			11	128	109
			17	80	74
16"	34.0	9.0	7	200	236
			9	160	1192
			11	128	159
			17	80	107
18"	38.0	10.0	7	200	328
			9	160	267
			11	128	224
			17	80	152

• IPS Line Cross Continued Next Page •

Other sizes and DR's not listed are available - Call For Quick Quote

Sizes 24" and smaller meet AWWA C906 fitting requirements, sizes 26" and larger are quoted per fitting.

WPR represents the long term hydrostatic pressure capacity of the fabricated cross with a 1.5:1 safety factor. To achieve a 2:1 safety factor like that of the straight pipe the WPR will be reduced.

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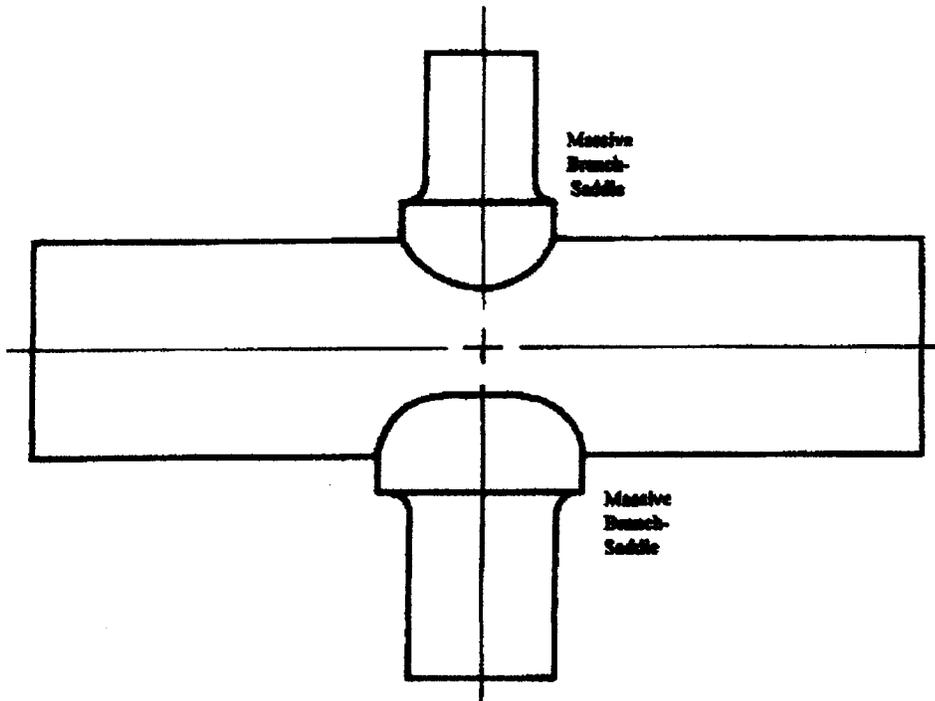
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## Reducing Crosses and End Options - IPS & DIPS



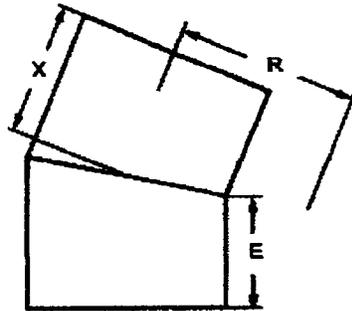
Reducing crosses use full-pressure rated massive-base branch-saddles. The permutations and combinations of equal and unequal reducing crosses is quite numerous (2" to 24" IPS & DIPS Outlets-by- 3" to 24" DIPS to 54" IPS pipe main). Call for a Quick Quote on the specific combination needed for the project. These reducing crosses are not normally a stocking item, but are made to order. While the tooling for every combination may not be immediately available, Independent Pipe Products can make the required tooling in a reasonable time frame in our own machine shop. Allow us to Quick Quote on your projects. We want to earn your business!

End options are your choice of butt-end, flanged, DIMJA, reducer end, etc.

# INDEPENDENT PIPE PRODUCTS



"BETTER BY DESIGN"®



## IPS 22.5° 2 Segment Elbow Fabricated (1/16 Bend) (Dimensions in Inches)

IPS Size	R/D Ratio	R	X	E	SDR	WPR (psi)	Weight (lbs)
2"	5.4	12.7	4.3	4.0	7	200	1
					9	160	1
					11&17	128/80	1
3"	3.8	13.2	4.4	4.0	7	200	2
					9	160	2
					11&17	128/80	1.5
4"	3.0	13.7	4.5	4.0	7	200	3.5
					9	160	3
					11&17	128/80	2.5
6"	2.2	14.7	6.7	6.0	7	200	9
					9	160	7
					11&17	128/80	6
8"	1.8	16.0	7.4	6.5	7	200	16
					9	160	13
					11	128	11
					17	80	9
10"	1.8	17.0	7.6	6.5	7	200	26
					9	160	21
					11	128	17
					17	80	12
12"	1.5	19.1	9.3	8.0	7	200	43
					9	160	35
					11	128	31
					17	80	20
14"	1.5	21.0	9.4	8.0	7	200	53
					9	160	42
					11	128	35
					17	80	24
16"	1.5	24.0	9.6	8.0	7	200	73
					9	160	61
					11	128	49
					17	80	33
18"	1.5	27.0	9.8	8.0	7	200	92
					9	160	75
					11	128	63
					17	80	43

**• IPS 2 Segment 22.5's Continued Next Page •**

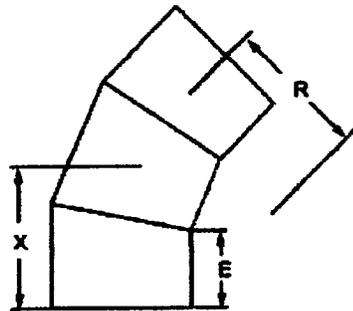
Other sizes, DR's and custom radius ell's not listed are available - Call For Quick Quote

Sizes 24" and smaller meet AWWA C906 fitting requirements, sizes 26" and larger are quoted per fitting.

# INDEPENDENT PIPE PRODUCTS



"BETTER BY DESIGN"®



## IPS 45° 3 Segment Elbow Fabricated (1/8 Bend) (Dimensions in Inches)

IPS Size	R/D Ratio	R	X	E	SDR	WPR (psi)	Weight (lbs)
2"	5.4	12.7	6.6	4.0	7	200	1.5
					9	160	1
					11&17	128/80	1
3"	3.8	13.2	6.8	4.0	7	200	3
					9	160	2
					11&17	128/80	2
4"	3.0	13.7	7.0	4.0	7	200	6
					9	160	5
					11&17	128/80	4
6"	2.2	14.7	9.4	6.0	7	200	1
					9	160	11
					11&17	128/80	9
8"	1.8	16.0	10.3	6.5	7	200	24
					9	160	19
					11	128	16
					17	80	12
10"	1.8	17.0	10.7	8.0	7	200	39
					9	160	32
					11	128	26
					17	80	18
12"	1.5	19.1	12.8	8.0	7	200	62
					9	160	51
					11	128	43
					17	80	29
14"	1.5	21.0	13.2	8.0	7	200	79
					9	160	64
					11	128	53
					17	80	36
16"	1.5	24.0	14.0	8.0	7	200	112
					9	160	91
					11	128	76
					17	80	51
18"	1.5	27.0	14.7	8.0	7	200	146
					9	160	119
					11	128	101
					17	80	68

• IPS 3 Segment 45's Continued Next Page •

Other sizes, DR's and custom radius ell's not listed are available - Call For Quick Quote

Sizes 24" and smaller meet AWWA C906 fitting requirements, sizes 26" and larger are quoted per fitting.

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# INDEPENDENT PIPE PRODUCTS



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## Elbow Design Information and End Options

The design basis for forge-molded elbows and fabricated segment elbows is well known. A 90 degree elbow is one-fourth of a torus (doughnut). The wedge removed from the straight pipe to make a miter-curve causes a force imbalance within the elbow. The ell tries to straighten out, sort of like a kink in a pressurized fire-hose. The ell must be derated or extra mass added to maintain the same pressure rating as the pipe itself. The heat-fusion welds are a focus point for the bending stress trying to straighten the ell. Continuous bend pipe without mitered fusion joints offer a higher pressure rating because there is no stress intensification factor (SIF) (i.e., no joints). Forge molded ellis offer the same tight radius, no fusion joint flow turbulence, no miter joint stress intensification, and full pressure rating. Fabricated miter-ellis have about the same radius of curvature, 4 turbulence amplifying fusion joints close together, and must be re-rated for WPR. The END OPTIONS for elbows include butt-end, flanged, and DIMJA.

ASME B31.3-1998 Edition

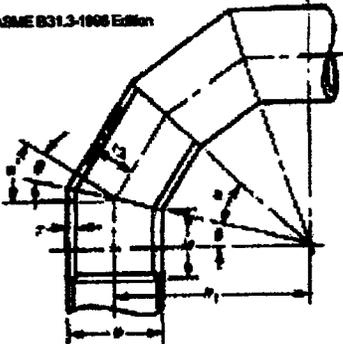


FIG. 304.23 NOMENCLATURE FOR MITER BENDS

The following nomenclature is used in the equations for pressure design of straight pipe.  
 $t_m$  = minimum required thickness, including mechanical, corrosion, and erosion allowances

$t$  = pressure design thickness, as calculated in accordance with para. 304.1.2 for internal pressure or as determined in accordance with para. 304.1.3 for external pressure  
 $c$  = the sum of the mechanical allowances (thread or groove depth) plus corrosion and erosion allowance\*. For threaded components, the nominal thread depth (dimension h of ASME B1.20.1, or equivalent) shall apply. For machined surfaces or grooves where the tolerance is not specified, the tolerance shall be assumed to be 0.5 mm (0.02 in.) in addition to the specified depth of the cut.  
 $T$  = pipe wall thickness (measured or minimum per purchase specification)

$d$  = inside diameter of pipe. For pressure design calculation, the inside diameter of the pipe is the maximum value allowable under the purchase specification.  
 $P$  = internal design gage pressure  
 $D$  = outside diameter of pipe as listed in tables of standards or specifications or as measured

$E$  = quality factor from Table A-1A or A-1B  
 $S$  = stress value for material from Table A-1  
 $Y$  = coefficient from Table 304.1.1, valid for  $t < D/8$  and for materials shown. The value of  $Y$  may be interpolated for intermediate temperatures. For  $t \geq D/8$ ,

$$Y = \frac{d + 2c}{D + d + 2c}$$

Multiple Miter Bends. The maximum allowable internal pressure shall be the lesser value calculated from Eqs. (4a) and (4b). These equations are not applicable when  $\theta$  exceeds

22.5 deg.

$$P_a = \frac{SE(T-c)}{t_2} \left( \frac{T-c}{(T-c) + 0.643 \tan \theta \sqrt{t_2(T-c)}} \right) \quad (4a)$$

$$P_a = \frac{SE(T-c)}{t_2} \left( \frac{R_1 - r_2}{R_1 - 0.5t_2} \right) \quad (4b)$$

(b) Single Miter Bends

- (1) The maximum allowable internal pressure for a single miter bend with angle  $\theta$  not greater than 22.5 deg. shall be calculated by Eq. (4a).
- (2) The maximum allowable internal pressure for a single miter bend with angle  $\theta$  greater than 22.5 deg. shall be calculated by Eq. (4c):

$$P_a = \frac{SE(T-c)}{t_2} \left( \frac{T-c}{(T-c) + 1.25 \tan \theta \sqrt{t_2(T-c)}} \right) \quad (4c)$$

$c$  The miter pipe wall thickness  $T$  used in Eqs. (4a), (4b), and (4c) shall extend a distance not less than  $M$  from the inside crotch of the end miter welds where

$M$  = the larger of  $2.5(r_1 T)^{0.5}$  or  $\tan \theta (R_1 - r_1)$   
 The length of taper at the end of the miter pipe may be included in the distance  $M$ .

(d) The following nomenclature is used in Eqs. (4a), (4b), and (4c) for the pressure design of miter bends:

- $c$  = same as defined in para. 304.1.1
- $E$  = same as defined in para. 304.1.1
- $P_a$  = maximum allowable internal pressure for miter bends
- $r_1$  = mean radius of pipe using nominal wall  $T$
- $R_1$  = effective radius of miter bend, defined as the shortest distance from the pipe centerline to the intersection of the planes of adjacent miter joints
- $S$  = same as defined in para. 304.1.1
- $T$  = miter pipe wall thickness (measured or minimum per purchase specification)
- $\theta$  = angle of miter cut
- $\alpha$  = angle of change in direction at miter joint =  $2\theta$

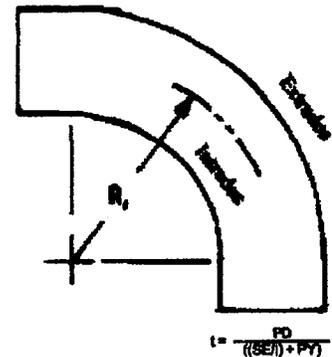
For compliance with this Code, the value of  $R_1$  shall be not less than that given by Eq. (5):

$$R_1 = \frac{A}{\tan \theta} + \frac{D}{2} \quad (5)$$

where  $A$  has the following empirical values: for U.S. customary units:

$$\frac{(T-c) \ln}{2.05} \quad \frac{A}{2(T-c)}$$

$0.5 < (T-c) < 0.85$        $\geq 0.85$   
 $\geq 0.85$        $\geq 1.17$



$$t = \frac{PD}{((SEI) + P)}$$

where at the intrados (inside bend radius)

$$I = \frac{4(R/D) - 3}{4(R/D) - 2}$$

where at the extrados (outside bend radius)

$$I = \frac{4(R/D) - 1}{4(R/D) - 2}$$

and at the sidewall on the bend centerline radius,  $I = 1.0$ .

$R_1$  = centerline radius of bend or elbow

# INDEPENDENT PIPE PRODUCTS

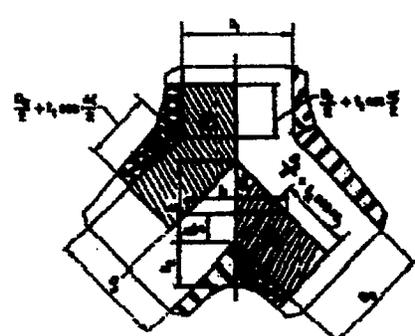
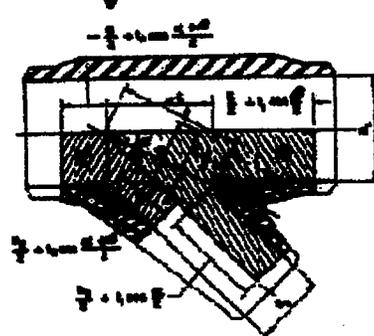
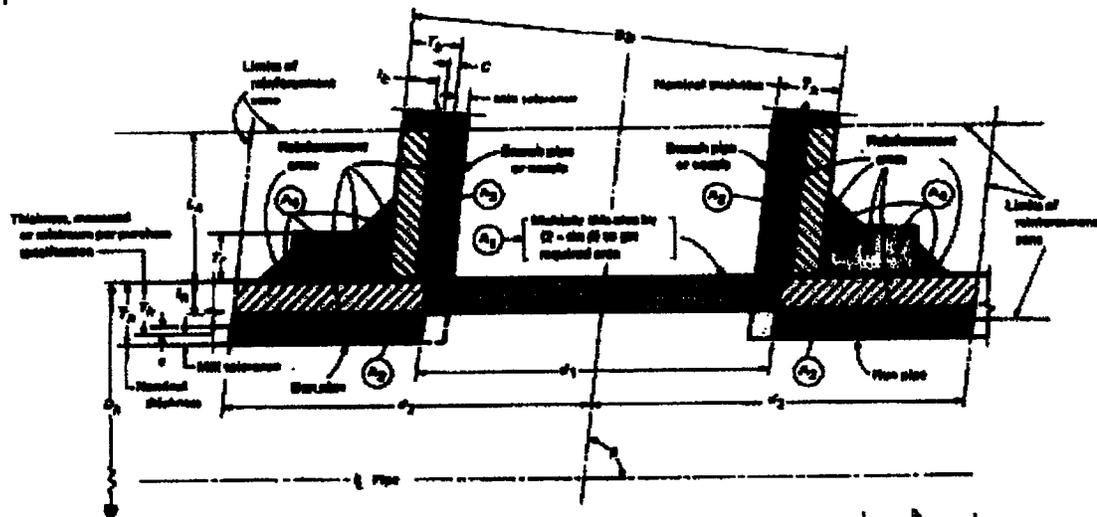


## Lateral Wye Design Information and End Options

The intersection of the branch into the main produces an elliptical hole (oval). The hoop of the pipe main is more severely breached than a line tee with its circular hole. The derating of the wye is based on geometry and the stress intensification at the intersection joint.

As the angle goes from a 90° tee to a 60° to 45° to 30° wye, the derating factor becomes more severe as the loss in "hoop" increases accordingly. The loss in pressure capacity or the reinforcement necessary to keep full pressure rating is determined in ASME B31.3, Paragraph #304.3.3, which includes the "beta" angle of the wye. The pressure capacity of an unreinforced 45° lateral wye using a 2:1 safety factor is about 45% of the pressure rating of the straight pipe used for its fabrication.

End options available are whatever may be required for the project, such as butt-end, flanged, DIMJA, etc.



### NOMENCLATURE

- A, B - METAL AREA, (sq. in.)
- D1, D2 - INSIDE DIAMETER OF FITTINGS, (in.)
- E, F - INDICATED PRESSURE AREA, (sq. in.)
- G, h, k - INDICATED LENGTHS, (in.)
- P - DESIGN PRESSURE, AT DESIGN TEMPERATURE, (psi)
- S, S<sub>1</sub> - ALLOWABLE STRESS AT DESIGN TEMPERATURE, (psi)
- t<sub>1</sub>, t<sub>2</sub> - INDICATED METAL THICKNESS, (in.)
- t<sub>3</sub> - AVERAGE METAL THICKNESS OF FLAT SURFACE, (in.)
- alpha, beta - INDICATED ANGLES

$$S_x \geq \frac{P(E + \frac{1}{2}A)}{A}$$

$$S_y \geq \frac{P(F + \frac{1}{2}B)}{A}$$

45° LATERAL WYE

$$S_x \geq \frac{P(E + \frac{1}{2}A)}{A}$$

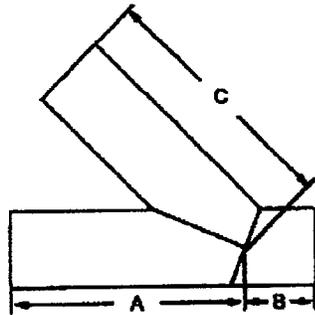
$$S_y \geq \frac{P(F + \frac{1}{2}B)}{A}$$

45° TRUE WYE

# INDEPENDENT PIPE PRODUCTS



"BETTER BY DESIGN"<sup>®</sup>



## IPS Fabricated 45° Lateral Wye Unreinforced (Dimensions in Inches)

IPS Size	A	B	C	SDR	WPR (psi)	Weight (lbs)
2"	18.0	6.0	14.0	7	200	3
				9	160	2
				11	128	2
3"	18.0	7.0	14.0	7	200	7
				9	160	6
				11	128	5
4"	22.0	7.0	22.0	7	200	16
				9	160	14
				11	128	12
6"	28.0	7.0	28.0	7	200	42
				9	160	33
				11	128	30
8"	30.0	8.0	30.0	7	200	74
				9	160	59
				11	128	51
10"	31.0	8.0	31.0	7	200	119
				9	160	98
				11	128	79
				17	80	55
12"	33.0	11.0	33.0	7	200	181
				9	160	148
				11	128	124
				17	80	84
14"	42.0	11.0	42.0	7	200	271
				9	160	217
				11	128	181
				17	80	123
16"	44.0	13.0	44.0	7	200	383
				9	160	311
				11	128	258
				17	80	174
18"	57.0	14.0	57.0	7	200	605
				9	160	493
				11	128	415
				17	80	280

• IPS 45° Lateral Wyes Continued Next Page •

Other sizes and DR's not listed are available - Call For Quick Quote

Sizes 24" and smaller meet AWWA C906 fitting requirements, sizes 26" and larger are quoted per fitting.

WPR represents the long term hydrostatic pressure capacity of the fabricated wye with a 1.5:1 safety factor. To achieve a 2:1 safety factor like that of the straight pipe the WPR will be reduced.

Call Toll FREE (800) 499-6927

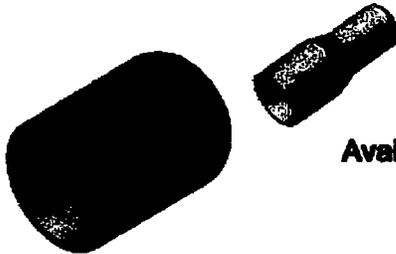
Page 14 - 2

Fax (800) 499-7124

Issued January 1, 2005

Version 1.3.1

Central Plastics Company  
39605 Independence  
Shawnee, OK 74801  
PH: 800.854.3872  
FX: 800.733.6993  
www.centralplastics.com



## MOLDED PE BUTT CAP

Available Size Range:

$\frac{1}{2}$ " ODS - 12" IPS  
4" ODS - 12" ODS \*

\* Available in PE 3408 only

At Central Plastics we are proud to be recognized as an international leader in the world of manufactured Polyethylene (PE) fittings. With manufacturing facilities located around the world, Central Plastics has been actively involved since the early 1960's in the research and promotion of innovative joining methods for polyethylene piping systems for the natural gas, potable water, wastewater, oilfield, mining landfill, telecommunications and geothermal industries.

With unparalleled expertise focusing on the design and manufacturing of polyethylene fittings, Central Plastics offers the largest, most complete line of polyethylene products, manufactured from a variety of common virgin resins, available in the market. Our substantial vertically integrated manufacturing capabilities allow Central Plastics to exercise complete control of our manufactured products. From design, to "state of the art" manufacturing, to shipping; Central Plastics maintains a high level of product consistency and quality throughout our manufacturing processes.

Central's Molded PE2406 Butt fittings are manufactured and tested to the requirements of ASTM D2513 and are manufactured for use with pipe conforming to ASTM D2513 and with Butt fittings conforming to ASTM D3261. Central's PE2406 Butt fittings are molded from a yellow medium density pre-blended virgin resin in accordance with the material specifications listed in ASTM D3350 with a PPI designation of PE2406. All Central Plastics PE2406 Butt Fittings are manufactured and tested to the requirements of ASTM D3261 and are compatible for heat fusion with any pipe and or fitting manufactured from a like or similar resin.

Central's Molded PE3408 Butt fittings are manufactured and tested to the requirements of ASTM D2513, and ANSI/AWWA C906 for use with pipe conforming to ASTM D2513/3035, F-714 and with Butt fittings conforming to ASTM D3261 as applicable. Central's PE3408 Butt fittings are molded from an NSF listed pre-blended virgin resin in accordance with the material specifications listed in ASTM D3350 with a PPI designation of PE3408. All Central Plastics PE3408 Butt Fittings are manufactured and tested to the requirements of ASTM D3261 and are compatible for heat fusion with any pipe and or fitting manufactured from a like or similar resin.

### AVAILABLE FEATURES:

- PE2406 fittings are engineered for use on MDPE Pipe
- PE3408 fittings are engineered for use on HDPE Pipe
- Pressure rated for natural gas and potable water applications (based on fitting DR)
- No de-rating of fitting required
- IAPMO Approved
- CSA Approved
- PE3408 fittings are tested to the requirements of AWWA C906
- PE3408 fittings are FM Approved (4" - 12")
- Can be joined by butt, socket or electrofusion
- Can be used with all conventional fusion equipment
- Manufactured in U.S.A.

Central Plastics Company  
38805 Independence  
Shawnee, OK 74801  
PH: 800.654.3872  
FX: 800.733.5993  
www.centralplastics.com



## MOLDED PE 90° ELBOW

Available Size Range:

3/4" IPS - 12" IPS  
4" DIPS - 12" DIPS\*

\* Available in PE 3408 only

At Central Plastics we are proud to be recognized as an international leader in the world of manufactured Polyethylene (PE) fittings. With manufacturing facilities located around the world, Central Plastics has been actively involved since the early 1960's in the research and promotion of innovative joining methods for polyethylene piping systems for the natural gas, potable water, wastewater, oilfield, mining landfill, telecommunications and geothermal industries.

With unparalleled expertise focusing on the design and manufacturing of polyethylene fittings, Central Plastics offers the largest, most complete line of polyethylene products, manufactured from a variety of common virgin resins, available in the market. Our substantial vertically integrated manufacturing capabilities allow Central Plastics to exercise complete control of our manufactured products. From design, to "state of the art" manufacturing, to shipping, Central Plastics maintains a high level of product consistency and quality throughout our manufacturing processes.

Central's Molded PE2406 Butt fittings are manufactured and tested to the requirements of ASTM D2513 and are manufactured for use with pipe conforming to ASTM D2513 and with Butt fittings conforming to ASTM D3261. Central's PE2406 Butt fittings are molded from a yellow medium density pre-blended virgin resin in accordance with the material specifications listed in ASTM D3350 with a PPI designation of PE2406. All Central Plastics PE2406 Butt Fittings are manufactured and tested to the requirements of ASTM D3261 and are compatible for heat fusion with any pipe and or fitting manufactured from a like or similar resin.

Central's Molded PE3408 Butt fittings are manufactured and tested to the requirements of ASTM D2513, and ANSI/AWWA C906 for use with pipe conforming to ASTM D2513/3035, F-714 and with Butt fittings conforming to ASTM D3261 as applicable. Central's PE3408 Butt fittings are molded from an NSF listed pre-blended virgin resin in accordance with the material specifications listed in ASTM D3350 with a PPI designation of PE3408. All Central Plastics PE3408 Butt Fittings are manufactured and tested to the requirements of ASTM D3261 and are compatible for heat fusion with any pipe and or fitting manufactured from a like or similar resin.

### AVAILABLE FEATURES:

- PE2406 fittings are engineered for use on MDPE Pipe
- PE3408 fittings are engineered for use on HDPE Pipe
- Pressure rated for natural gas and potable water applications (based on fitting DR)
- No de-rating of fitting required
- IAPMO Approved
- CSA Approved
- PE3408 fittings are tested to the requirements of AWWA C906
- PE3408 fittings are FM Approved (4" - 12")
- Can be joined by butt, socket or electrofusion
- Can be used with all conventional fusion equipment
- Manufactured in U.S.A.

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Shawnee, OK 74801  
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www.centralplastics.com



## MOLDED PE FLANGE ADAPTER



Available Size Range:            2" IPS - 24" IPS  
   4" DWS - 24" DWS

(Beveled for Butterfly Valves Available on Request)

At Central Plastics we are proud to be recognized as an international leader in the world of manufactured Polyethylene (PE) fittings. With manufacturing facilities located around the world, Central Plastics has been actively involved since the early 1960's in the research and promotion of innovative joining methods for polyethylene piping systems for the natural gas, potable water, wastewater, oilfield, mining landfill, telecommunications and geothermal industries.

With unparalleled expertise focusing on the design and manufacturing of polyethylene fittings, Central Plastics offers the largest, most complete line of polyethylene products, manufactured from a variety of common virgin resins, available in the market. Our substantial vertically integrated manufacturing capabilities allow Central Plastics to exercise complete control of our manufactured products. From design, to "state of the art" manufacturing, to shipping; Central Plastics maintains a high level of product consistency and quality throughout our manufacturing processes.

Central's Molded PE3408 Flange Adapters are manufactured and tested to the requirements of ASTM D2513, and ANSI/AWWA C906 for use with pipe conforming to ASTM D2513/3035, F-714 and with Butt fittings conforming to ASTM D3261 as applicable. Central's PE3408 Flange Adapters are molded from an NSF listed pre-blended virgin resin in accordance with the material specifications listed in ASTM D3350 with a FPI designation of PE3408. All Central Plastics PE3408 Flange Adapters are manufactured and tested to the requirements of ASTM D3261 and are compatible for heat fusion with any pipe and or fitting manufactured from a like or similar resin.

### AVAILABLE FEATURES:

- PE3408 fittings are engineered for use on HDPE Pipe
- Pressure ratings up to SDR7 on most sizes.
- No de-rating of fitting required
- PE3408 fittings are tested to the requirements of AWWA C906
- PE3408 fittings are FM Approved (4" - 24" IPS sizes only)
- Can be joined by butt fusion or electrofusion
- Can be used with all conventional fusion equipment
- Manufactured in U.S.A.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent and reliable data collection processes to support effective decision-making.

3. The third part of the document focuses on the role of technology in data management and analysis. It discusses how modern software solutions can streamline data collection, storage, and reporting, thereby improving efficiency and accuracy.

4. The fourth part of the document addresses the challenges associated with data security and privacy. It provides guidance on implementing robust security measures to protect sensitive information from unauthorized access and breaches.

5. The fifth part of the document discusses the importance of data quality and integrity. It outlines strategies for identifying and addressing data errors, ensuring that the information used for analysis is accurate and reliable.

6. The sixth part of the document explores the role of data in strategic planning and performance management. It explains how data-driven insights can help organizations identify trends, set goals, and track progress against key performance indicators.

7. The seventh part of the document concludes by summarizing the key findings and recommendations. It emphasizes the need for a data-driven culture and continuous improvement in data management practices to achieve long-term success.

# Modern High Performance Flanges

## IPP Deltaflex® Flanges

### DUCTILE IRON

For use on HDPE and stainless steel stub-ends

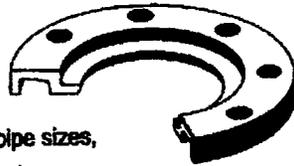
#### Lap Joints

BUP-SDR ANSI

DIPS Ductile iron pipe sizes,

DF2DI Metric dimensions

Cast ductile iron backup rings



ASTM A536, GGG 40

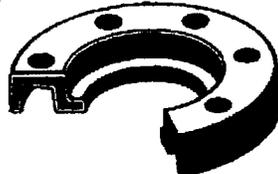
#### Polypropylene

PPDA Metric

PPDI ANSI

Polypropylene encapsulated glass reinforced ductile iron

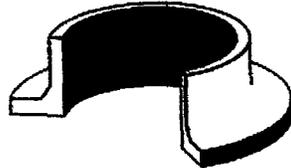
PPDI DIN/ANSI Combination



ASTM A536, GGG 40

### HDPE FLANGE ADAPTERS

PESE-SDR



PE 3406  
ASTM d 3350

### STAINLESS STEEL

For use on HDPE and stainless steel stub-ends

#### Lap Joints

SS-SDR For HDPE & Steel Stub-ends

BUSO-LW For Slip-on Stub-ends

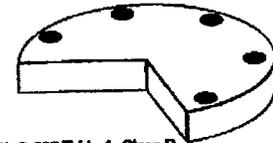
BUSO-SW For Slip-on Stub-ends

Cast stainless steel backup rings



ASTM A351 CF8M 316  
ASTM A351 CF8 304

#### Blind Flange BSS

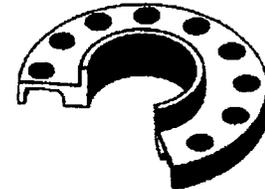


AWWA C-207 Table 1, Class D

#### Welded Slip-on

SOHP High Pressure

Slip-on welded flange

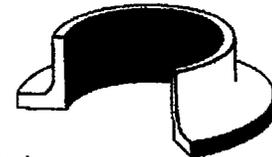


ASTM A182F 316L  
ASTM A351 CF3M 316L

#### Welded Slip-on Stub-end

SOSE Stainless steel

Cast slip-on welded stub-end designed for use with modified I.D. Deltaflex® flanges

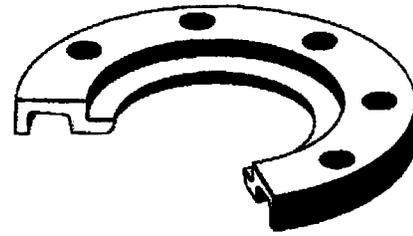
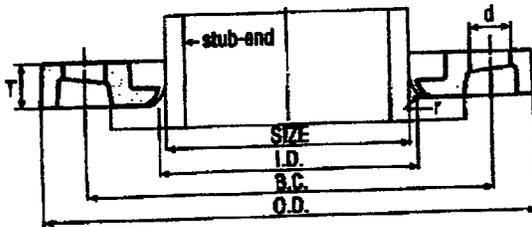


ASTM A351 CF3M 316L

IMPROVED PIPING (IPP) PRODUCTS, INC.

A Strong Customer Connection

## Stainless Steel Flange/Backup Ring



- **Description** Utilizes the patented IPP Deltaflex® flange cross section.
- **Utilization** HDPE, stainless steel, and carbon steel stub-ends.
- **Materials** Cast in stainless steel ASTM A351CF8M (316), CF8 (304), tensile 70,000 psi; yield 30,000 psi; 30% elongation.
- **Dimensions** Bolt circle is ANSI/B16.5 class 150. Mates with ANSI B16.5, B16.47, AWWA C207.
- **Finish** Net shape to fully machined.

Pipe Diameter	IPP Product Code*	Outside Dia. O.D.	Flange Thickness T	Inside Dia. I.D.	Bolt Count N	Dia. Bolt Hole B.D.	Bolt Circle B.C.	Radius r	Weight lbs/pc	Operating <sup>1</sup> Pressure
1"	SS316-SDR7-01	4.25	0.56	1.36	4	0.63	3.13	0.13	2.0	267
1 1/2"	SS316-SDR7-0150	5.00	0.69	1.97	4	0.63	3.88	0.22	2.0	267
2"	SS316-SDR7-02	6.00	0.75	2.46	4	0.75	4.75	0.27	3.0	267
2"	SS316-SDR11-02	6.00	0.40	2.46	4	0.75	4.75	0.27	2.0	160
3"	SS316-SDR7-03	7.50	0.94	3.60	4	0.75	6.00	0.33	5.0	267
3"	SS316-SDR13.5-03	7.50	0.40	3.60	4	0.75	6.00	0.33	3.0	128
4"	SS316-SDR7-04	9.00	0.94	4.60	8	0.75	7.50	0.39	6.0	267
4"	SS316-SDR13.5-04	9.00	0.50	4.60	8	0.75	7.50	0.39	5.0	128
6"	SS316-SDR7-06	11.00	1.00	6.75	8	0.88	9.50	0.44	9.0	267
6"	SS316-SDR13.5-06	11.00	0.60	6.75	8	0.88	9.50	0.44	6.0	128
8"	SS316-SDR7-08	13.50	1.12	8.75	8	0.88	11.75	0.44	12.0	267
8"	SS316-SDR13.5-08	13.50	0.70	8.75	8	0.88	11.75	0.44	9.0	128
10"	SS316-SDR7-10	16.00	1.27	10.92	12	1.00	14.25	0.50	20.0	267
10"	SS316-SDR7.3-10	16.00	1.19	10.92	12	1.00	14.25	0.42	18.0	250
10"	SS316-SDR13.5-10	16.00	0.90	10.92	12	1.00	14.25	0.42	12.0	128
12"	SS316-SDR7-12	19.00	1.77	12.92	12	1.00	17.00	0.50	37.0	267
12"	SS316-SDR11-12	19.00	1.25	12.92	12	1.00	17.00	0.42	24.0	160
12"	SS316-SDR13.5-12	19.00	1.05	12.92	12	1.00	17.00	0.42	21.0	128
14"	SS316-SDR7-14	21.00	1.78	14.18	12	1.13	18.75	0.41	50.0	267
14"	SS316-SDR9.3-14	21.00	1.38	14.18	12	1.13	18.75	0.50	40.0	183
14"	SS316-SDR17-14	21.00	1.13	14.18	12	1.13	18.75	0.41	25.0	100
16"	SS316-SDR7-16	23.50	2.17	16.19	16	1.13	21.25	0.40	67.0	267
16"	SS316-SDR13.5-16	23.50	1.44	16.19	16	1.13	21.25	0.50	52.0	160
16"	SS316-SDR17-16	23.50	1.25	16.19	16	1.13	21.25	0.41	31.0	80
18"	SS316-SDR7-18	25.00	2.06	18.20	16	1.25	22.75	0.40	67.0	267
18"	SS316-SDR11-18	25.00	1.56	18.20	16	1.25	22.75	0.50	57.0	160
18"	SS316-SDR21-18	25.00	1.34	18.20	16	1.25	22.75	0.41	33.0	60
20"	SS316-SDR7-20	27.50	2.27	20.25	20	1.25	25.00	0.31	90.0	267
20"	SS316-SDR13.5-20	27.50	1.69	20.25	20	1.25	25.00	0.50	69.0	128
20"	SS316-SDR21-20	27.50	1.47	20.25	20	1.25	25.00	0.38	39.0	80

1. Operating pressure on HDPE stub-ends at a safety factor of two.

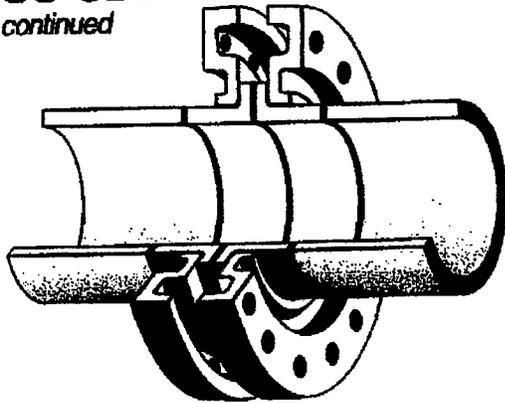
\*Material code, either 316 or 304

IPP has the engineering capability to design in-house any back-up flange in the IPP Deltaflex® flange shape to any design pressure and temperature conditions at dramatic savings in cost.

Continued for sizes 22" through 63" on pg. 5

# SS-SDR

continued



## Stainless Steel Flange/Backup Ring

Pipe Diameter	IPP Product Code	Outside Dia. O.D.	Flange Thickness T	Inside Dia. I.D.	Bolt Count N	Dia. Bolt Hole B.D.	Bolt Circle B.C.	Radius r	Weight lbs/pc	Operating <sup>1</sup> Pressure
22"	SS316-SDR7-22	29.50	2.43	22.25	20	1.38	27.25	0.31	106.0	267
22"	SS316-SDR13.5-22	29.50	1.81	22.25	20	1.38	27.25	0.50	78.0	128
22"	SS316-SDR21-22	29.50	1.54	22.25	20	1.38	27.25	0.38	50.0	80
24"	SS316-SDR7-24	32.00	2.60	24.25	20	1.38	29.50	0.31	116.0	267
24"	SS316-SDR13.5-24	32.00	1.88	24.25	20	1.38	29.50	0.50	97.0	128
24"	SS316-SDR26-24	32.00	1.60	24.25	20	1.38	29.50	0.38	65.0	64
26"	SS316-SDR11-26	34.25	2.50	26.38	24	1.38	31.75	0.50	119.0	160
26"	SS316-SDR21-26	34.25	2.20	26.38	24	1.38	31.75	0.31	96.0	80
26"	SS316-SDR11-28	36.50	2.68	28.38	28	1.38	34.00	0.50	134.0	160
26"	SS316-SDR21-28	36.50	2.30	28.38	28	1.38	34.00	0.31	109.0	80
30"	SS316-SDR7-30	38.75	3.80	30.38	28	1.38	36.00	0.31	302.0	267
30"	SS316-SDR13.5-30	38.75	2.75	30.38	28	1.38	36.00	0.50	174.0	128
30"	SS316-SDR26-30	38.75	2.18	30.38	28	1.38	36.00	0.31	121.0	64
32"	SS316-SDR13.5-32	41.75	2.85	32.38	28	1.63	38.50	0.50	190.0	128
32"	SS316-SDR26-32	41.75	2.36	32.38	28	1.63	38.50	0.31	145.0	64
34"	SS316-SDR13.5-34	43.75	3.30	34.38	32	1.63	40.50	0.20	228.0	128
34"	SS316-SDR17-34	43.75	2.95	34.38	32	1.63	40.50	0.50	209.0	100
34"	SS316-SDR26-34	43.75	2.68	34.38	32	1.63	40.50	0.31	168.0	64
36"	SS316-SDR17-36	46.00	3.00	36.38	32	1.63	42.75	0.50	230.0	100
36"	SS316-SDR32.5-36	46.00	2.35	36.38	32	1.63	42.75	0.31	167.0	50
40"	SS316-SDR21-40	50.75	3.45	39.75	36	1.63	47.25	0.50	341.0	80
42"	SS316-SDR21-42	53.00	3.25	42.38	36	1.63	49.50	0.50	330.0	80
42"	SS316-SDR39-42	53.00	2.48	42.38	36	1.63	49.50	0.31	223.0	40
48"	SS316-SDR26-48	59.50	3.50	48.50	44	1.63	56.00	0.50	405.0	64
48"	SS316-SDR62-48	59.50	2.45	48.50	44	1.63	56.00	0.25	291.0	30
54"	SS316-SDR26-54	66.25	3.86	54.62	44	1.88	62.75	0.50	513.0	64
54"	SS316-SDR52-54	66.25	2.80	54.62	44	1.88	62.75	0.19	365.0	30
63"/60	SS316-SDR26-60	73.00	3.54	64.02	52	1.88	69.25	0.20	495.0	51
63"/60	SS316-SDR52-63	73.00	3.23	64.02	52	1.88	69.25	0.51	455.0	32

1. Operating pressure on HDPE stub-ends at a safety factor of two.

\*Material code, either 316 or 304

IPP has the engineering capability to design, in-house, any back-up flange in the IPP Deltaflex® flange shape to any design pressure and temperature conditions at dramatic savings in cost

**THIS SECTION RESERVED FOR:**

**VALVE DATA**

## Type-21 Ball Valves

### 1.0 SCOPE:

All requirements are for PVC, CPVC, PP & PVDF Type-21 Ball Valves and accessories.

### 2.0 MATERIALS:

- U-PVC – Conforming to ASTM D1784 Cell Classification 12454 A
- CPVC – Conforming to ASTM D1784 Cell Classification 23567 A
- Polypropylene – Conforming to ASTM D4101 Cell Classification PP0210B67272
- PVDF – Conforming to ASTM D3222-91A Cell Classification Type II
- FKM – Viton® Fluorocarbon Rubber
- EPDM – Ethylene Propylene Diene Terpolymer Rubber
- PTFE – Teflon® Polytetrafluoroethylene

### 3.0 Type-21 Ball Valves:

All Type-21 ball valves sized 1/2" – 6" shall be of True-Union design with 2-way blocking capability. PTFE seats shall have elastomeric backing cushions to provide smooth even stem torque and to compensate for wear. Valves shall feature molded ISO mounting top flange for actuation installation and Panel Mount feature on bottom of valve for securing in-line. The handle shall double as the spanner wrench for maintenance and carrier adjustment.

### 3.1 Operators:

Type-21 1/2" – 6" (Lever Type standard)  
Lever Handle to be Asahi Standard valve handle Red color.

### 3.2 Approved Manufacturer

Type-21 Ball Valves shall be provided by Asahi/America, Inc. of Malden, MA with no approved equals. Manufacturer must be ISO-9001 certified.

### 3.3 Working Temperature:

Valves shall have a pressure rating of:

230 psi at 70° F sizes 1/2" – 3"
PVC, CPVC, PVDF (Soc, Thd or Butt)
150 psi at 70° F sizes 1/2" – 6" PP, 4 – 6" PVC, CPVC, & PVDF
150 psi at 70° F sizes 1/2" – 6"
PVC, CPVC, PP & PVDF (Flanged)

### 4.0 Accessories:

#### 4.1 Stem Extensions

Stem extensions where required should be designed, built and provided by the Asahi/America, Inc., and be 1 of 3 styles:

Style BV-A Two piece extension with outer housing 100% sealed either free standing or supported design.

Style BV-B Single piece extension either free standing or supported design

Style BV-P Single piece Panel Mount Extension made of PVC

Minimum Length = 4"

Maximum Length = 12"

Not Available for 4" or 6" Valves

#### 4.2 Actuation

Actuation where required should be designed, built and provided by Asahi/America, Inc., and be either pneumatic (Series 79P) or electric (Series 83, 94, or 92) type. All actuation accessories to be provided and installed by Asahi/America, Inc. in accordance with manufacturers requirements.

#### **4.3 Locking Devices**

Where required locking devices can be installed over the valve handle to prevent unauthorized operation of the valve.

#### **4.4 Operating Nuts**

Where required 2" square operating nuts can be installed in place of valve handle.  
Materials of construction – Anodized Aluminum.

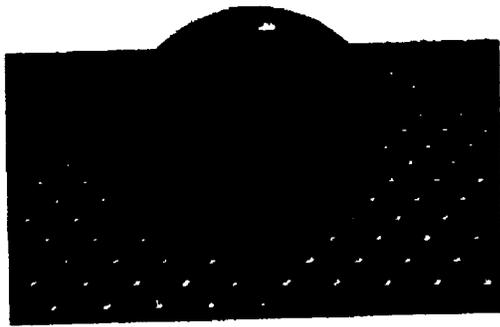
#### **5.0 Certifications:**

##### **5.1 NSF-61**

PVC/EPDM and PVC/FKM models shall have NSF-61 Certification for use in drinking water applications.

#### **6.0 INSTALLATION PROCEDURES:**

All valve joints shall be prepared using the preferred joining method for the valve material and installation type in accordance with all requirements put forth in the Type-21 Operation & Maintenance manual. All accessories should be installed in accordance with the manufacturers requirements as well as any facility requirements.



## Type 21 Ball Valve

### Standard Features (Sizes 1/2" - 6")

- Pressure rated up to 230 psi (PVC, CPVC, PVDF)
- Double O-ring seals on stem for an added protection.
- Full bore, sizes 1/2" - 2"
- Full vacuum rated, all sizes
- Blocks in two directions, upstream and downstream, leaving full pressure on the opposite end of the valve
- Integrally molded ISO mounting pad for both manual and actuated operations
- Integrally molded base pad to mount valves securely or panel mounting
- PTFE seats with elastomeric backing cushions ensure bubble-tight shut-off and a low fixed torque, while at the same time compensating for wear
- True Union design for easier installation or repairs without expanding the pipe system
- Built-in spanner wrench on the handle for valve disassembly and assembly
- Two sets of end connectors (socket and threaded) included with all PVC and CPVC valves in sizes 1/2" - 2"
- CPVC threaded end connectors on sizes 1/2" - 1" come with stainless steel reinforcing rings

### Options

- Pneumatic and electric actuators & accessories
- Stem extensions
- 2" square operating nut or "T" nut
- Locking and/or spring return handles
- Limit switches
- Vented Ball



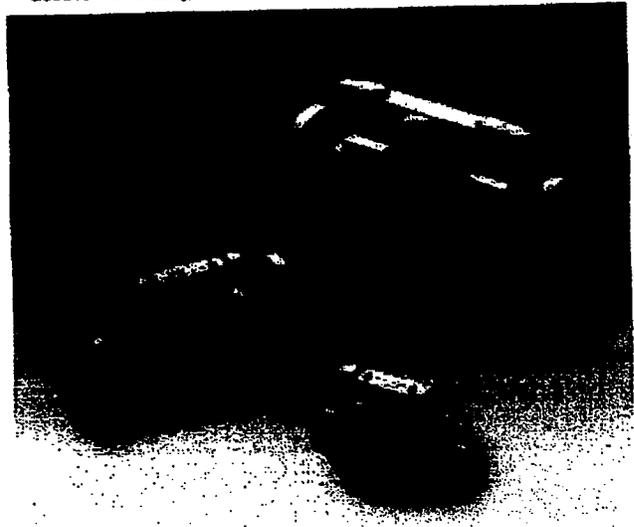
### Specifications

Sizes: 1/2" - 6"  
 Models: PVC & CPVC Socket, Threaded and Flanged (ANSI)  
 PP & PVDF IPS and Metric (DIN)  
 socket, Threaded, Butt and Flanged (ANSI)  
 Bodies: PVC, CPVC, PP, PVDF  
 Seats: PTFE backed with EPDM or FKM  
 Seals: EPDM or FKM or AFLAS

### Parts List (Sizes 1/2" - 2")

PARTS			
NO.	DESCRIPTION	PCS.	MATERIAL
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	Carrier	1	PVC, CPVC, PP, PVDF
4	End Connector	2	PVC, CPVC, PP, PVDF
5	Union Nut	2	PVC, CPVC, PP, PVDF
6	Stem	1	PVC, CPVC, PP, PVDF
7	Seat	2	PTFE
8	O-Ring (A)	2	EPDM, FKM, Others
9	O-Ring (B)	1	EPDM, FKM, Others
10	O-Ring (C)	2	EPDM, FKM, Others
11	O-Ring (D)	1	EPDM, FKM, Others
12	O-Ring (E)	1	EPDM, FKM, Others
13	Stop Ring*	2	PVDF
14	Handle	1	ABS
4a	Ring**	2	304 Stainless Steel

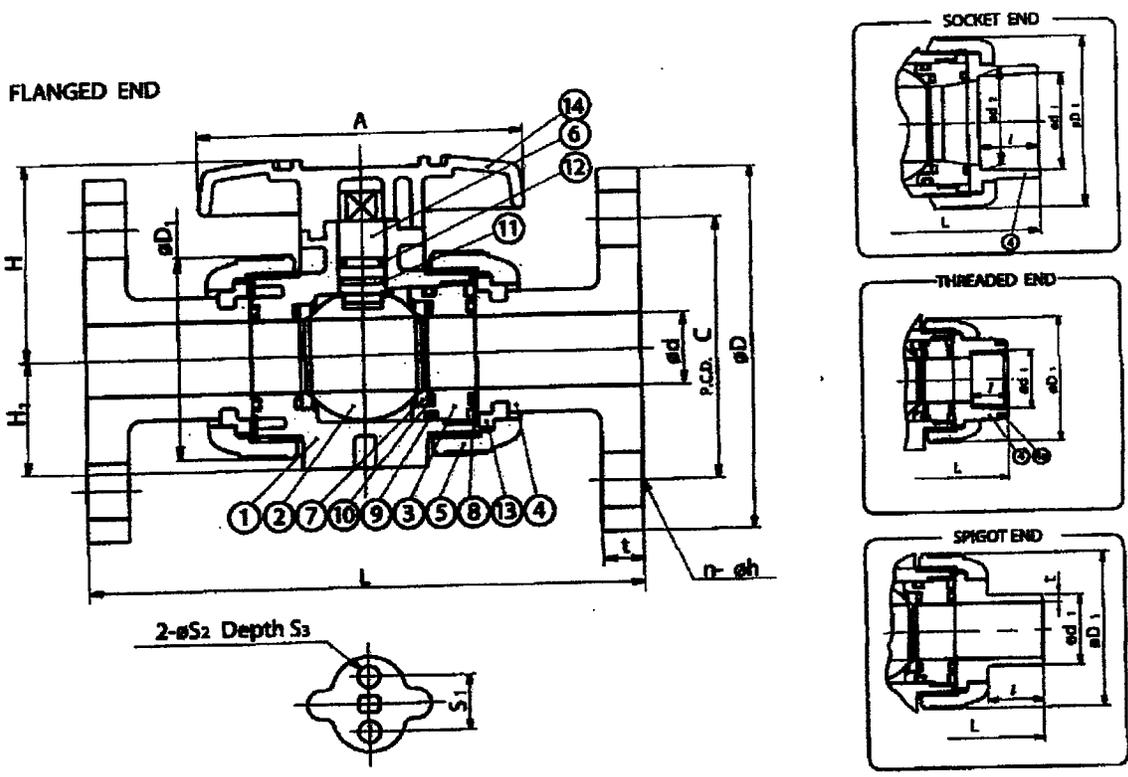
\* Used for flanged and  
 \*\* Used for CPVC body, threaded end, 1/2" - 1"



**ASAHI/AMERICA**  
 NEW YORK, NY

# Type 21

# Ball Valves



## Dimensions (Sizes 1/2" - 2")

NOMINAL SIZE		FLANGED								SOCKET											
		ANSI CLASS 150								PVC, CPVC				PP, PVDF (DIN)				PP, PVDF (IPS)			
		D	C	n	h	L	t	d1	d2	l	L	d1	d2	l	L	d1	l	L			
1/2	15	0.59	3.50	2.38	4	0.62	5.63	0.47	0.848	0.836	0.875	4.45	0.768	0.760	0.57	3.90	0.83	0.87	4.45		
3/4	20	0.79	3.88	2.75	4	0.62	6.77	0.55	1.058	1.046	1.000	5.08	0.965	0.967	0.63	4.49	1.03	1.00	5.08		
1	25	0.98	4.25	3.12	4	0.62	7.36	0.55	1.325	1.310	1.125	5.75	1.240	1.232	0.71	4.84	1.30	1.13	5.75		
1 1/4	32	1.26	4.62	3.50	4	0.62	7.48	0.63	1.670	1.655	1.250	6.46	1.553	1.543	0.81	5.47	1.65	1.25	6.46		
1 1/2	40	1.57	5.00	3.88	4	0.62	8.35	0.63	1.912	1.894	1.375	7.24	1.947	1.937	0.93	5.83	1.89	1.37	7.24		
2	50	2.01	6.00	4.75	4	0.75	9.21	0.63	2.387	2.369	1.500	8.23	2.461	2.445	1.08	6.93	2.36	1.50	8.23		

NOMINAL SIZE		THREADED							SPIGOT (BUTT END)								
									PP, PVDF								
		DIN 3442		PP	PVDF				S1	S2	S3						
1/2	15	1/2-14 NPT	0.59	4.02	1.89	2.03	1.14	3.62	0.787	0.728	0.098	0.075	4.882	0.75	0.29	0.43	
3/4	20	3/4-14 NPT	0.67	4.72	2.36	2.34	1.38	3.94	0.984	0.866	0.106	0.075	5.670	0.75	0.29	0.43	
1	25	1-11 1/2 NPT	0.79	5.16	2.76	2.68	1.54	4.33	1.260	0.886	0.118	0.094	6.063	0.75	0.29	0.43	
1 1/4	32	1 1/4-11 1/2 NPT	0.87	5.91	3.23	3.17	1.85	4.76	1.575	1.024	0.146	0.094	6.850	1.18	0.35	0.59	
1 1/2	40	1 1/2-11 1/2 NPT	0.98	6.42	3.94	3.50	2.17	5.16	1.969	1.260	0.161	0.118	7.638	1.18	0.35	0.59	
2	50	2-11 1/2 NPT	1.10	7.76	4.96	4.04	2.60	6.26	2.480	1.417	0.228	0.118	8.819	1.18	0.35	0.59	

35 Green Street, P.O. Box 653, Malden, MA 02148 • Tel: 800-343-3618 • 781-321-5408 • Fax: 800-426-7058 • E-mail: [asahi@asahi-america.com](mailto:asahi@asahi-america.com)  
 Register at our interactive web site for on line ordering, product availability, order tracking, and many useful features: [www.asahi-america.com](http://www.asahi-america.com)

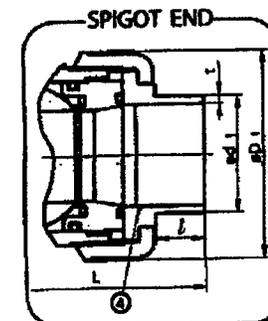
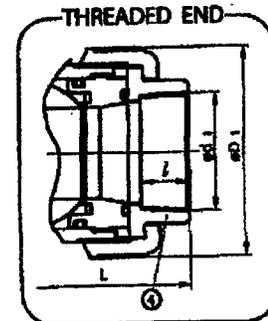
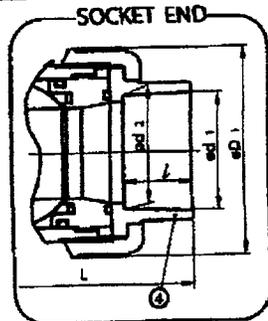
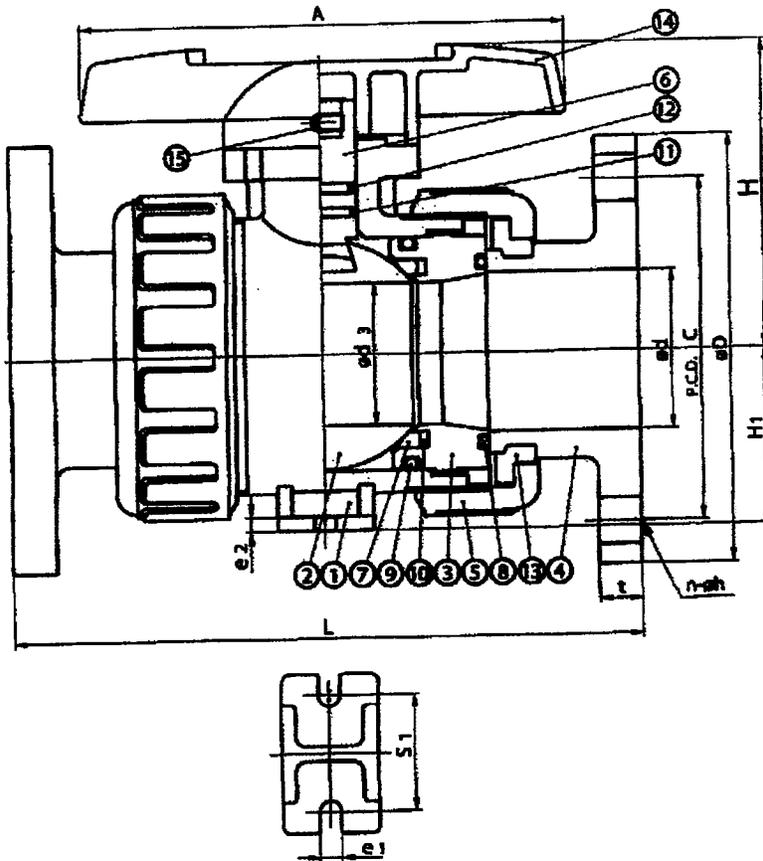
# Type 21

# Ball Valves

FLANGED END

PARTS (DIFFERENT NUMBERS FROM 1/2" - 2")			
NO.	DESCRIPTION	PCS.	MATERIAL
10	Cushion	2	EPDM, FKM, Others
15	Screw	1	304 Stainless Steel

NOTE: Quantity on Nos. 3 and 9 (see p. 6) is 2.



## Dimensions (Sizes 2 1/2" - 4") FOR 6" SIZE CONSULT FACTORY

NOMINAL SIZE		FLANGED								SOCKET									
		ANSI CLASS 150								PVC, CPVC			PP, PVDF (DIN)			PP, PVDF (IPS)			
		d	D	C	n	h	L	t	ASTM SCH 80			DIN 16962							
INCHES	MM							d1	d2	l	L	d1	d2	l	L	d1	l	L	
2 1/2	65	2.56	7	5.5	4	0.75	10.2	0.71	2.889	2.868	1.75	9.45	2.923	2.911	1.22	8.15	2.88	1.752	9.45
3	80	3.07	7.5	6	4	0.75	11.97	0.71	3.516	3.492	1.875	11.1	3.512	3.498	1.4	9.68	3.48	1.874	11.1
4	100	3.94	9	7.5	8	0.75	14.65	0.71	4.518	4.491	2	13.9	4.293	4.278	1.63	12.2	4.48	2.252	14.37

NOMINAL SIZE		THREADED							SPIGOT (BUTT END)									
									PP, PVDF									
									DIN 3442			PP		PVDF				
INCHES	MM	d1	l	L	ds	D1	H	H1	A	d1	l	t	t	L	e1	e2	S1	
2 1/2	65	2 1/2 - 8NPT	1.26	8.46	2.28	5.24	4.96	2.83	7.87	2.953	1.496	0.272	0.142	9.72	0.35	0.24	1.89	
3	80	3 - 8NPT	1.38	10.39	2.70	5.98	5.51	3.35	9.45	3.543	1.496	0.323	0.169	11.61	0.43	0.28	2.17	
4	100	4 - 8NPT	1.77	14.17	3.54	8.27	7.01	4.33	11.81	4.331	1.752	0.394	0.209	12.72	0.43	0.31	2.56	

**ASAHI/AMERICA**  
Rev. D 06-06

# Type 21

# Ball Valves

## Pressure vs. Temperature (PSI, WATER, NON-SHOCK)

NOMINAL SIZE		PVC				CPVC				PP				PVDF						
		30° F	71° F	106° F	121° F	30° F	71° F	106° F	121° F	141° F	176° F	-5° F	86° F	121° F	141° F	-5° F	71° F	106° F	141° F	176° F
INCHES	mm	70° F	105° F	120° F	140° F	70° F	105° F	120° F	140° F	175° F	195° F	85° F	120° F	140° F	175° F	70° F	105° F	140° F	175° F	210° F
1/2-2	15-50	230	170	150	30	230	170	150	120	75	55	150	110	90	55	230	185	150	115	85
2 1/2	65	230	170	150	NA	230	170	150	120	75	55	150	95	70	40	230	185	150	115	85
3	80	230	170	150	NA	230	170	150	85	55	40	150	95	70	40	230	185	150	100	70
4-6	100-150	150	150	150	NA	150	150	150	85	55	40	150	95	70	40	150	150	150	100	70

### Sample Specification

All TYPE 21 Ball Valves, sizes 1/2" to 4", shall be of true union design with two-way blocking capability. All O-rings shall be EPDM or FKM with PTFE seats. PTFE seats shall have elastomeric backing cushion of the same material as the valve seals. Stem shall have double O-rings and be of blowout-proof design. The valve handle shall double as carrier removal and/or tightening tool. ISO mounting pad shall be integrally molded to valve body for actuation. PVC conforming to ASTM D1784 Cell Classification 12454-A, CPVC conforming to ASTM D1784 Cell Classification 23567-A, PP Conforming to ASTM D4101 Cell Classification PPO210B67272 and PVDF conforming to ASTM D3222 Cell Classification Type II. The ball valves, except PP, shall have a pressure rating of 230 psi for sizes 1/2" to 3" and 150 psi for 4" (150 psi for PP, all sizes) at 70° F. Type 21 Ball Valves must carry a two-year guarantee, as manufactured by Asahi/America, Inc.

### Cv Values

NOMINAL SIZE		Cv
INCHES	mm	
1/2	15	14
3/4	20	29
1	25	47
1 1/4	32	72
1 1/2	40	155
2	50	190
2 1/2	65	365
3	80	410
4	100	680

### Weight (POUNDS)

NOMINAL SIZE		SOCKET THREADED	FLANGED
INCHES	mm		
1/2	15	0.44	1.10
3/4	20	0.66	1.54
1	25	1.10	2.70
1 1/4	32	1.54	3.30
1 1/2	40	2.64	4.40
2	50	4.40	8.15
2 1/2	65	6.17	8.80
3	80	9.70	13.00
4	100	24.00	26.67

### Caution

- Never remove valve from pipeline under pressure.
- Always wear protective gloves and goggles.
- Watch out for trapped fluid in valve. It is safe to close valve before removing it from the pipeline.

### Caution

- Do not use ball valves where media has suspended particles. Use the following valves:  
*Butterfly Valves* - PVDF disc is most abrasion resistant and make sure of chemical compatibility.  
*Diaphragm Valves* - Elastomeric diaphragm is designed for handling suspended particles.
- Volatile fluids such as sodium hypochlorite (NaClO) and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) could be trapped and gasified within the valve. We can provide you with a Type 21 ball valve with a *vented ball* to relieve pressure build-up inside the valve.

### Troubleshooting

#### What if the fluid still flows when valve is closed?

1. Carrier is not properly tightened. Tighten it.
2. PTFE seat is damaged or worn. Replace seat.
3. Foreign material is caught between ball and PTFE seat. Remove material and clean.
4. Ball is damaged or worn. Change ball.

#### What if fluid leaks outside of valve?

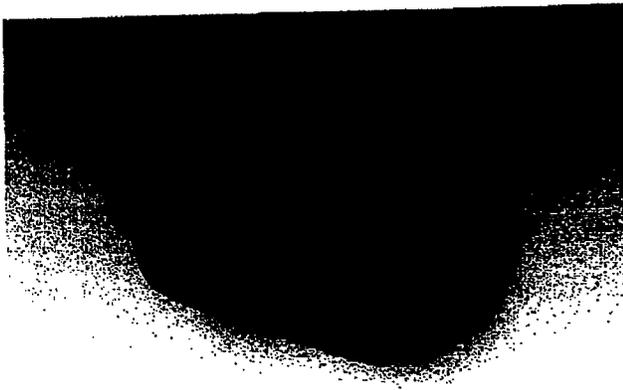
1. Union nut not properly tightened. Retighten.
2. Carrier is not properly tightened. Thread it in firmly.
3. Carrier or face O-ring is damaged, worn, or missing. Replace O-ring.

#### What if handle does not rotate smoothly?

1. Foreign material has formed on the ball or seat. Clean both.
2. Internal part(s) chemically attacked or swollen. Refer to Asahi/America Chemical Resistance Chart for compatibility. Replace part(s) as required.
3. Carrier over-tightened. Retighten properly.

#### What if handle rotates too freely?

1. Stem is damaged. Replace stem.
2. Handle is not engaged with stem. Disassemble and reengage. Inspect.
3. Engaging part of stem and/or ball is damaged. Change stem and/or ball.



## True Union Ball Check Valve

### Standard Features (Sizes 1/2" - 2")

- Uniseat/seal of EPDM or FKM
- Ball is the only moving part. It unseats to permit flow in one direction but seals against seat to prevent backflow.
- May be used vertically or horizontally
- Minimum shut-off of 5 psi
- All sizes rated for full vacuum service
- Solid thermoplastic ball

### Options:

- PTFE coated FKM uniseat/seal
- Spring-loaded ball to assist ball in seating faster

**Specifications**

Sizes: True Union: 1/2" - 2"  
Single Union: 3" - 4"

Models: Socket, Threaded, Flanged (ANSI), Butt End

Bodies: PVC, CPVC, PP and PVDF

Seats: EPDM, FKM, PTFE

Seals: EPDM, FKM, PTFE

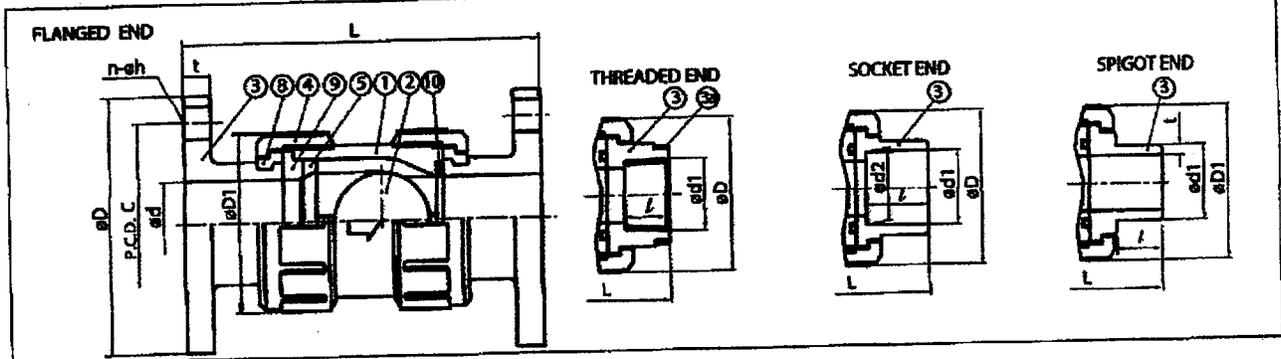
Option: Foot Valve

### Parts List - True Union (Sizes 1/2" - 2")

PARTS			
NO.	DESCRIPTION	PCS.	MATERIAL
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	End Connector	2	PVC, CPVC, PP, PVDF
4	Union Nut	2	PVC, CPVC, PP, PVDF
5	Stop Ring (A)	1	PVC, CPVC, PP, PVDF
8	Stop Ring (B)*	1	PVDF
9	Seat	1	EPDM, FKM, PTFE
10	O-Ring	1	EPDM, FKM, PTFE
3a	Ring**	1	Stainless Steel 304

\* Used for flanged end

\*\* Used for CPVC body, threaded end; 1/2" - 1"



### Dimensions (Sizes 1/2" - 2")

NOMINAL SIZE	FLANGED						THREADED						SOCKET						SPIGOT(BUTT END)									
	ANSI CLASS 150												PVC, CPVC			PP, PVDF (DIM)			PP, PVDF (IPS)			PP, PVDF						
	D	C	n	h	L	t	d1	L	L	d	D1	d1	d2	L	L	d1	d2	L	L	d1	L	L	d1	L	t	t	L	
1/2	15	3.50	2.38	4	0.82	5.12	0.47	1/2-14NPT	0.59	3.39	0.59	1.89	0.848	0.836	0.888	3.43	0.768	0.700	0.57	3.19	0.83	0.87	3.31	0.787	0.728	0.098	0.075	4.00
3/4	20	3.88	2.75	4	0.82	6.10	0.55	3/4-14NPT	0.67	4.06	0.79	2.36	1.058	1.046	0.719	3.86	0.965	0.957	0.83	3.70	1.09	1.00	4.43	0.984	0.868	0.106	0.075	4.35
1	25	4.25	3.12	4	0.62	6.50	0.85	1-11/2NPT	0.79	4.45	0.98	2.76	1.325	1.310	0.875	4.37	1.240	1.232	0.71	4.13	1.30	1.19	4.35	1.260	0.868	0.118	0.094	4.75
1 1/4	30	-	-	-	-	-	-	1 1/4-11/2NPT	0.87	5.00	1.22	3.78	1.670	1.655	0.838	4.92	-	-	-	-	-	-	-	-	-	-	-	-
1 1/2	40	5.00	3.88	4	0.62	7.56	0.83	1 1/2-11/2NPT	0.98	5.94	1.57	3.78	1.912	1.894	1.094	5.94	1.947	1.937	0.93	5.62	1.89	1.37	5.57	1.969	1.260	0.181	0.118	5.75
2	50	6.00	4.75	4	0.75	8.43	0.83	2-11/2NPT	1.10	6.97	2.01	4.17	2.387	2.369	1.156	6.77	2.481	2.445	1.08	6.69	2.36	1.50	6.49	2.480	1.417	0.228	0.118	6.50

**ASAHI/AMERICA**

Rev. D 06-06

## Ball Check Valves

### 1.0 SCOPE:

All requirements are for PVC, CPVC, Polypropylene & PVDF True-Union and Single Union Ball Check Valves and accessories.

### 2.0 MATERIALS:

- U-PVC – Conforming to ASTM D1784 Cell Classification 12454 A
- CPVC – Conforming to ASTM D1784 Cell Classification 23567A
- Polypropylene – Conforming to ASTM D4101 Cell Classification PP0210B67272
- PVDF – Conforming to ASTM D3222-91A Cell Classification Type II
- FKM – Viton<sup>®</sup> Fluorocarbon Rubber
- EPDM – Ethylene Propylene Diene Terpolymer Rubber
- PTFE – Polytetrafluoroethylene

### 3.0 VALVES:

Ball Check valves shall be PVC, CPVC, PP or PVDF body with EPDM, FKM or PTFE seals.

Valves shall be of solid thermoplastic construction, and be designed with an elastomeric uniseat/seal for tight shut-off under pressure. Sizes 1/2" – 2" shall be true union, and sizes 3" & 4" shall be single union.

### 3.1 Approved Manufacturer

Valves shall be provided by Asahi/America, Inc. of Malden, MA with no approved equals. Manufacturer must be ISO-9001 certified.

### 3.2 Pressure Vs. Temperature

Valves shall have a pressure rating of:

150 psi at 70° F sizes 1/2" – 2"  
100 psi at 70° F sizes 3" & 4"

### 4.0 ACCESSORIES:

#### 4.1 SS Spring

Valves shall be capable of being machined to accept a 316 SS Spring or PTFE Coated 316 SS spring where required. A minimum 10 psi inlet pressure is required to "crack" open the valve with this option.

#### 4.2 Foot Valve Screen

Valves shall accept the option of a PVC Foot valve screen on the inlet side of the valve for use in applications where the valve is in a tank on the suction side of the pump to protect against foreign material entering the system.

### 5.0 Certifications:

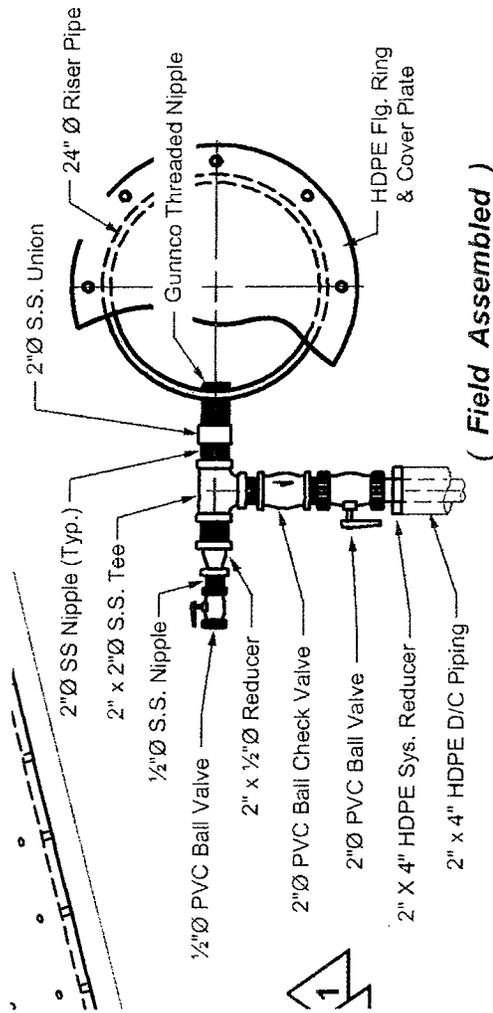
#### 5.1 NSF-61

PVC/EPDM and PVC/FKM models shall have NSF-61 Certification for use in drinking water applications.

### 6.0 INSTALLATION PROCEDURES:

All valve joints shall be prepared using the preferred joining method for the valve material and installation type in accordance with all requirements put forth in the Ball Check Valve Operation & Maintenance manual. All accessories should be installed in accordance with the manufacturers requirements as well as any facility requirements.

**THIS SECTION RESERVED FOR:  
PROPOSED HDPE FABRICATED STRUCTURES**



( Field Assembled )

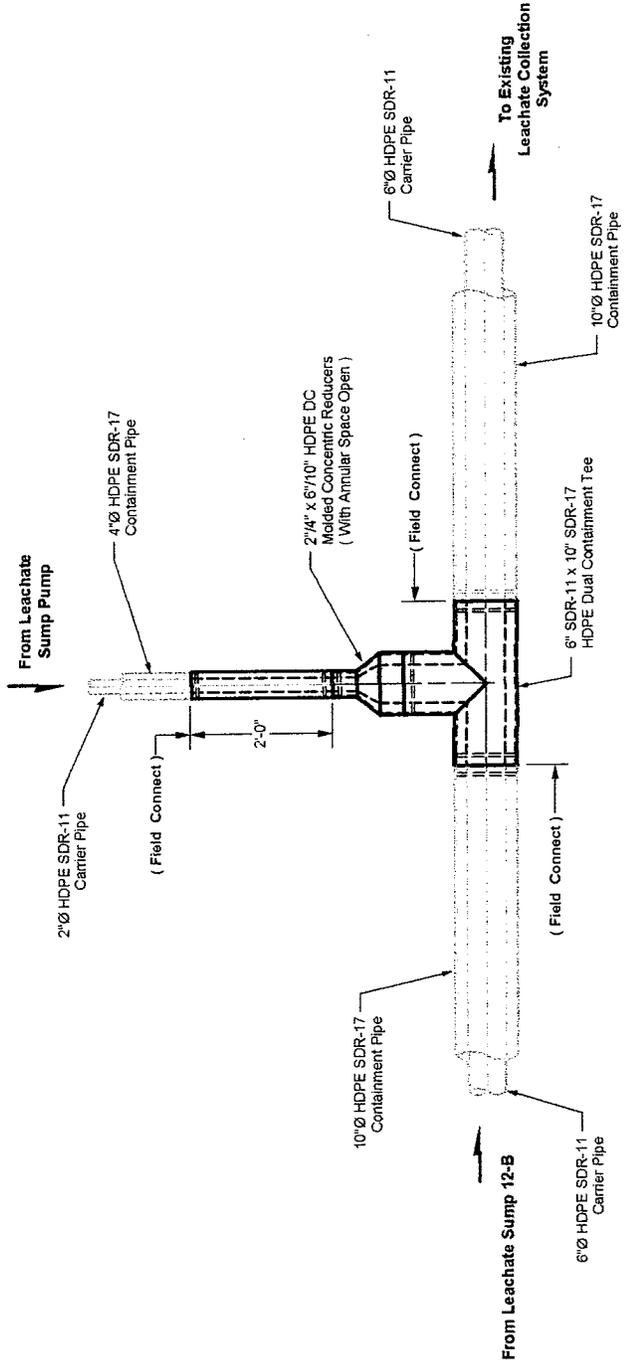
Upper Riser Access Pipe



HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.	
<b>APPROVED</b>	
BY: <i>FLN</i>	DATE: <i>12/11/07</i>



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**Leachate Collection Tie-In For 12-A**

**Qty. - 1 Req'd.**

NO.		DATE		BY	
<b>REVISIONS</b>					
Drawn By: J. Yoder		Date: 11-9-07			
Technician:		Date:			
PFF Estimator:		Date:			
Q/C:		Date:			
Customer Approval:		Date:			

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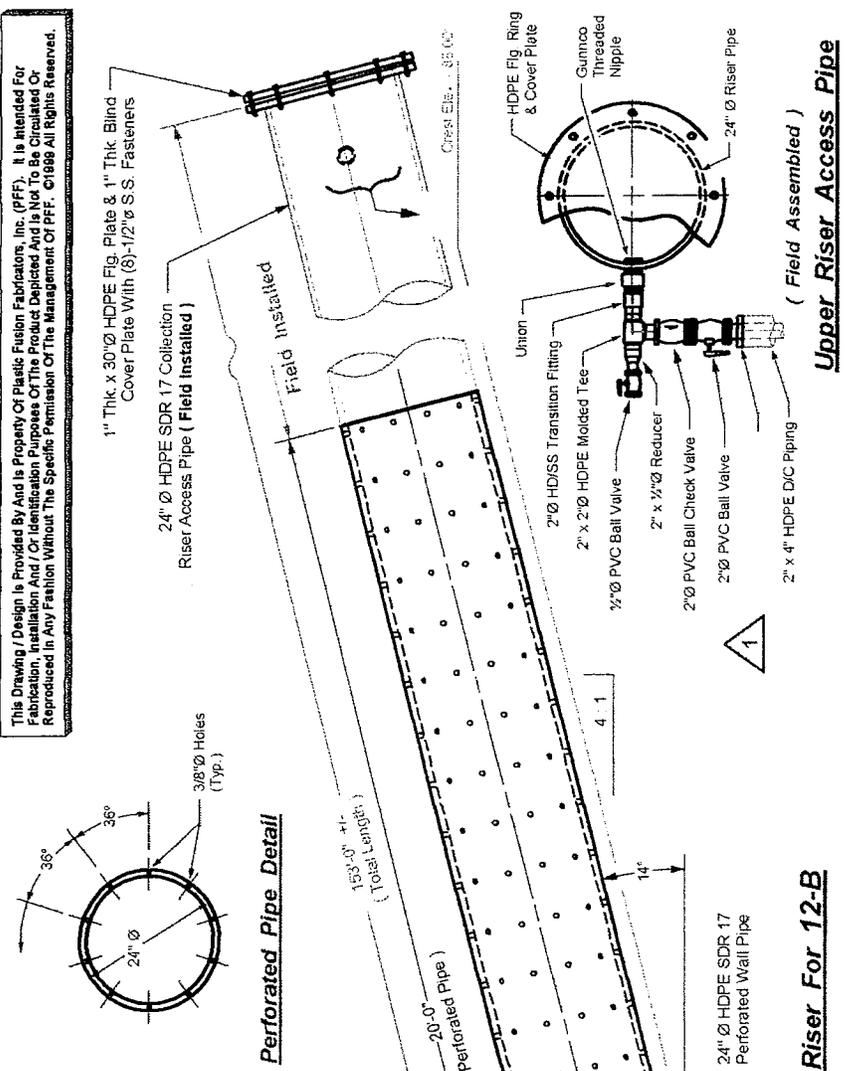
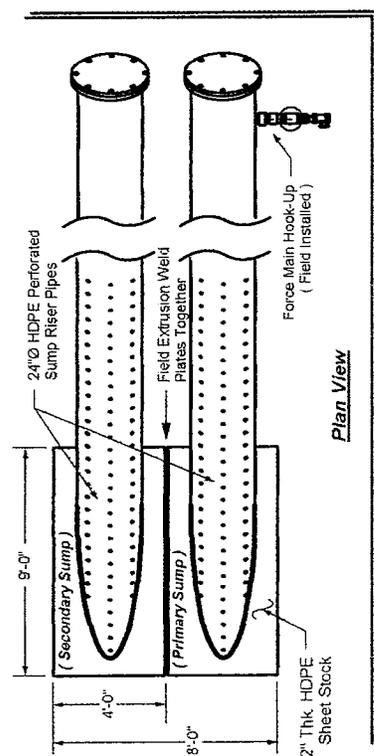
3455 Shawwood Blvd. - Huntsville, Alabama 35811  
 Tel: 256-852-0378 / Fax: 256-852-0388 / <http://www.plasticfusion.com>

East Carolina Reg. MSWLF / Windsor, North Carolina

Shop Details For HDPE Leachate Collection Tie-In To Force Main  
 For **CELL No. 12-A** Sump Area ( West End Of Cell 12 )

PFF Drawing No: 02300 c Scale 1 : 20  
 PFF Job No: F-7515 Sheet: 3 of 4





**Lower Collection Sump Riser For 12-B**

**Upper Riser Access Pipe**

System Excludes:

Perforated Pipe, Insulation and Elbow Hose  
**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

**APPROVED**

Qty. - 2 Sumps Req'd.  
 (1 - Primary, 1 - Secondary)

BY: *[Signature]* DATE: 12/13/07

NO.	DATE	REVISIONS
1	11-29-07	Replaced 90° Elbow With Tee, Added Reducer & 1/2" Ball Valve (Force-Main Hookup)

Drawn By: J. Yoder	Date: 11-9-07
Technician:	Date:
PFF Estimator:	Date:
QC:	Date:
Customer Approval:	Date:

**PFF** Plastic Fusion Fabricators, Inc.  
 Your Total Containment Resource

3456 Stanwood Blvd. - Huntsville, Alabama 35811  
 Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com

East Carolina Reg. MSWLF / Windsor, North Carolina

Shop Details For HDPE Leachate Collection Sump Riser & Access  
 For **CELL No. 12-B** Sump Area (East End Of Cell 12)

PFF Drawing No: 02300-515 b Scale 1:20 REV.  
 PFF Job No: F-7515 Sheet 2 of 4 **A**

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# **GunnCo Pump & Control Inc.**

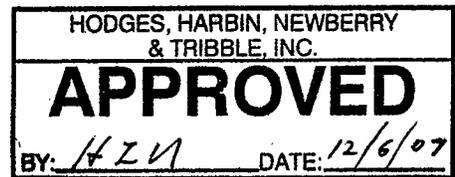
## **Sidesloper™ Leachate Pumping System**

**Project: East Carolina Landfill**  
**Contractor: R.B. Baker Construction, INC.**

**GunnCo Project Reference # 1781**

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# ***GunnCo Pump & Control Inc.***

## ***Sidesloper*<sup>™</sup> Leachate Pumping System**

### **Contact Information**

**For technical questions, replacement parts, or service  
contact GunnCo.**

Mailing address: P.O. Box 3022  
Cumming, GA 30028

Shipping address: 125-G Enterprise Drive  
Cumming, GA 30040

Phone: 770-889-7114  
Fax # : 770-889-2754  
e-mail: [andre@gunnco.com](mailto:andre@gunnco.com)  
Emergency #: 404-316-3131

[www.gunnco.com](http://www.gunnco.com)

[www.landfillpumps.com](http://www.landfillpumps.com)

# **GunnCo *Sidesloper* Leachate Pumping System**

Project Equipment List      GunnCo Project Reference #1781

## **East Carolina Landfill**

### **Submersible Leachate Pump Cell12A**

One (1) GunnCo Sidesloper Pump Assemblies P2K85.1 in stainless steel construction / Teflon fitted, 1.5 HP 3/230 v, submersible motors complete with patented wheeled carrier with 1/4" x 100' stainless steel pull cable. Pump system suitable for use in a 24" riser pipe SDR 17 (**please advise actual SDR**). Each motor provided with 125 feet continuous length power cables. Discharge is 2" with stainless cam lock fittings. Pump will produce about 83 gpm @ TDH of 34 feet.

One (1) Sidesloper GC 101 Control Panel, NEMA 4X stainless steel enclosure interior door mounted operator controls. Panel provides for automatic operation and control for pump and includes level indicators with 0 – 138.6" read out, Lightning arrestors for 460v, 120V and instrument surge protection, main disconnects, motor overloads, motor contactors, fuses, fused plug in phase monitors, corrosion inhibitor, RUN lights, High Level flashing displays, H-O-A switches, and all components for motor protection, operation and level control for each pump. Unit is intrinsically safe and includes permanent bellows for transducers.

One (1) Level Control Packages - Transducers with Surge Suppression protection/warranty, 125' cables.

One (1) 2" x 100' hose with stainless steel quick connects and assembly fittings.

One (1) 2" exit fitting nipple (special machined discharge nipple).

One (1) Set Cable Fittings as required for gas tight seal and cable recovery.

One (1) set 2" PVC ball and ball check valve.

One (1) Flow meter panel mounted with flow "T" and paddle wheel sensor.

One (1) GunnCo Panel Mounting Rack Galvanized

Operations and Maintenance books.

\* SDR 17

# **GunnCo *Sidesloper* Leachate Pumping System**

Project Equipment List      GunnCo Project Reference #1781

## **East Carolina Landfill**

### **Submersible Leachate Pump Cell12B**

One (1) GunnCo Sidesloper Pump Assemblies P2K85.2 in stainless steel construction / Teflon fitted, 3 HP 3/230 v, submersible motors complete with patented wheeled carrier with 1/4" x 175' stainless steel pull cable. Pump system suitable for use in a 24" riser pipe SDR 17 (**please advise actual SDR**)\*. Each motor provided with 175 feet continuous length power cables. Discharge is 2" with stainless cam lock fittings. Pump will produce about 88 gpm @ TDH of 65 feet.

One (1) Sidesloper GC 101 Control Panel, NEMA 4X stainless steel enclosure interior door mounted operator controls. Panel provides for automatic operation and control for pump and includes level indicators with 0 – 138.6" read out, Lightning arrestors for 460v, 120V and instrument surge protection, main disconnects, motor overloads, motor contactors, fuses, fused plug in phase monitors, corrosion inhibitor, RUN lights, High Level flashing displays, H-O-A switches, and all components for motor protection, operation and level control for each pump. Unit is intrinsically safe and includes permanent bellows for transducers.

One (1) Level Control Packages - Transducers with Surge Suppression protection/warranty, 175' cables.

One (1) 2" x 175' hose with stainless steel quick connects and assembly fittings.

One (1) 2" exit fitting nipple (special machined discharge nipple).

One (1) Set Cable Fittings as required for gas tight seal and cable recovery.

One (1) set 2" PVC ball and ball check valve.

One (1) Flow meter panel mounted with flow "T" and paddle wheel sensor.

One (1) GunnCo Panel Mounting Rack Galvanized

Operations and Maintenance books.

\*  
SDR 17

# **GunnCo *Sidesloper* Leachate Pumping System**

Engineering Comments

GunnCo Project 1781

## **East Carolina Landfill**

### **EXCEPTIONS**

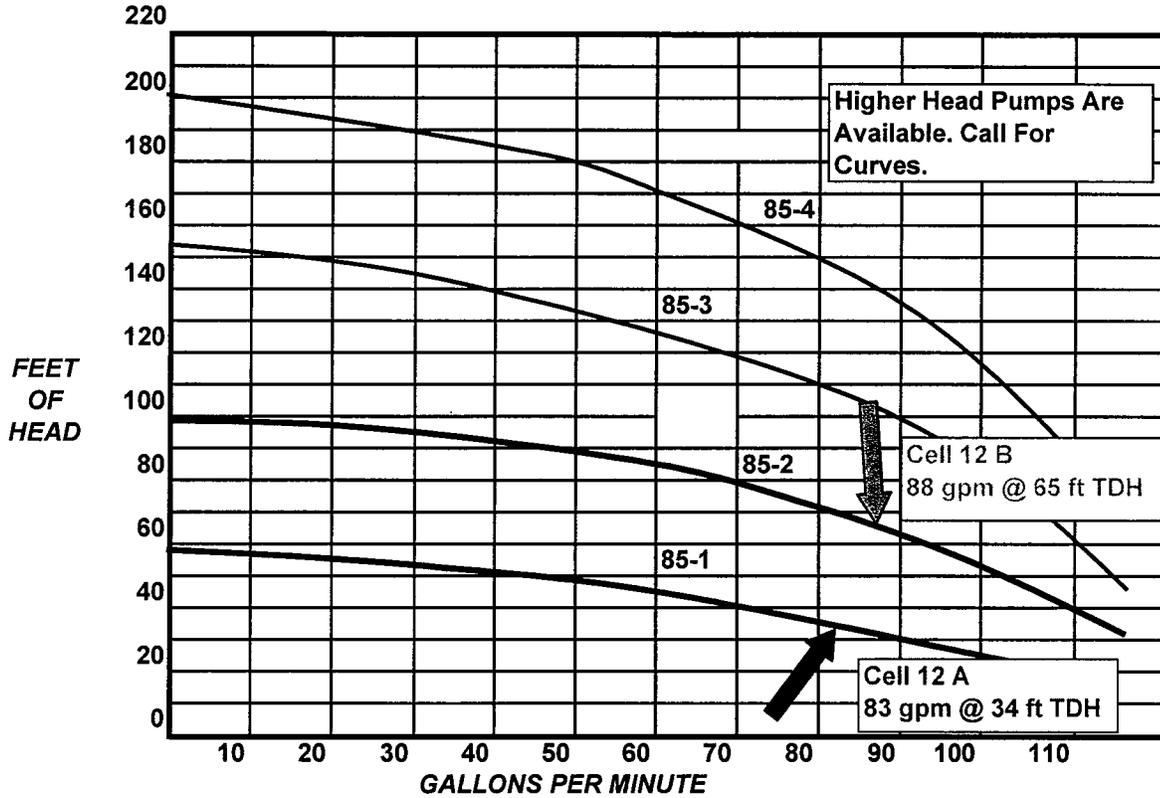
- 1) We are not supplying, electrical work, riser pipes, discharge pipe from exit fitting in our scope. These items to be provided by general contractor.
- 2) Control panel rack and panel mounting to be completed by others.
- 3) An "AS BUILT" dimension should be provided prior to the installation of the pumping system.
- 4) The riser pipe, wet well and collection system should be inspected prior to final closure/welding to ensure that no HDPE shavings, mud, rock, or debris is present in the system. Pipe shavings from construction is a frequent cause of pump problems in new cells. Pumps are designed to pump clear leachate. Failure due to debris in pump is not covered under warranty.

# GunnCo ..... Sidesloper™ Pump

85 GALLONS PER MINUTE NOMINAL FLOW PUMP

P2K-85

MULTI-STAGE TURBINE SIDE SLOPE EXTRACTION PUMP



PUMP	MODEL	H.P.	* "L"
P2K	85-1	1.5	36"
P2K	85-2	3.0	46"
P2K	85-3	5.0	55"
P2K	85-4	5.0	55"

\* "L" Represents maximum length  
Consult GunnCo for actual "L"  
dimension.

All pumps include wheeled carrier and are designed for application in 24" SDR 11 to 22 HDPE pipe.

Pumps may be ordered for use in 18" or other custom pipe sizes.

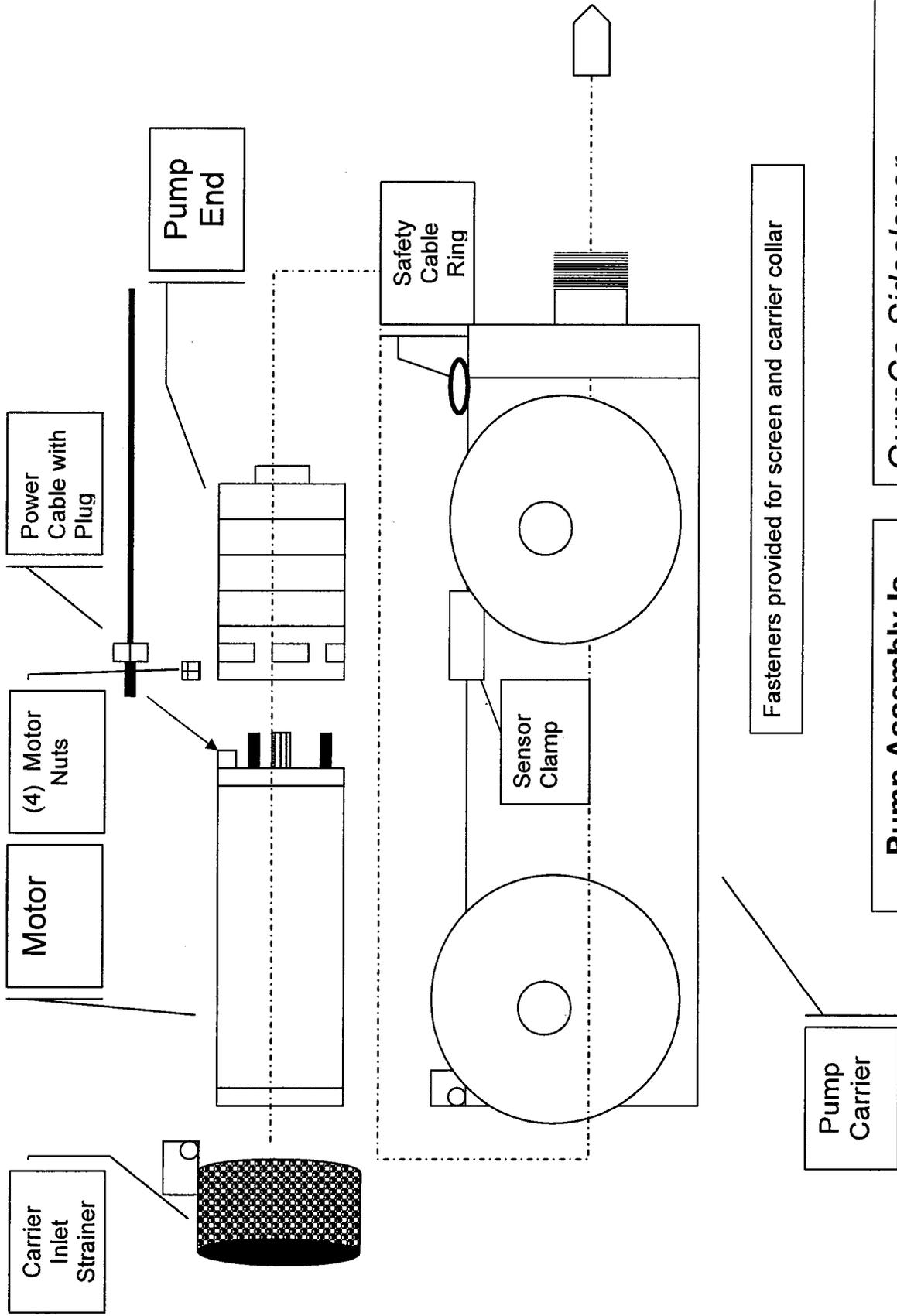
Pump construction is 304 stainless steel with bearings and seals of Teflon material.  
Motor construction 304 S/S  
Carrier construction 304 S/S

# MATERIALS OF CONSTRUCTION

## Leachate Pumps

### Pump Model P2K 85.1 and 85.2

Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Diffuser Chamber	304 Stainless Steel
Impeller	304 Stainless Steel
Suction Interconnector	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Pump Shaft	431 Stainless Steel
Straps	304 Stainless Steel
Priming Inducer	304 Stainless Steel
Coupling	329/431 Stainless Steel
Check Valve Seat	Teflon/316 Stainless Steel
Top Bearing	Teflon/316 Stainless Steel
Impeller Seal Ring	Teflon/316 Stainless Steel
Intermediate Bearings	Teflon/316 Stainless Steel
Shaft Washer	LCP (Vectra®)
Split Cone	304 Stainless Steel
Split Cone Nut	304 Stainless Steel



**Pump Assembly Is Shipped Pre-Assembled**

**GunnCo Sidesloper Model P2K Pump Assembly**  
 Protected by U.S. Patent MBG 1.5.2K

# **GunnCo Sidesloper™**

## **MODEL P2K MOTOR DATA 1.5 HP, 3/230V/60**

<b>HORSE POWER</b>	:	<b>1.5 hp</b>
<b>PHASE</b>	:	<b>3</b>
<b>VOLTS</b>	:	<b>230 volts</b>
<b>FREQUENCY</b>	:	<b>60 Hz</b>
<b>SERVICE FACTOR</b>	:	<b>1.3</b>
<b>FULL LOAD AMPS</b>	:	<b>5.0 amps</b>
<b>AMPS @ SF</b>	:	<b>5.9 amps</b>

**Line to line Resistance : 3.2 – 4.0 Ohms**

**Locked rotor amps : 33.2 amps**

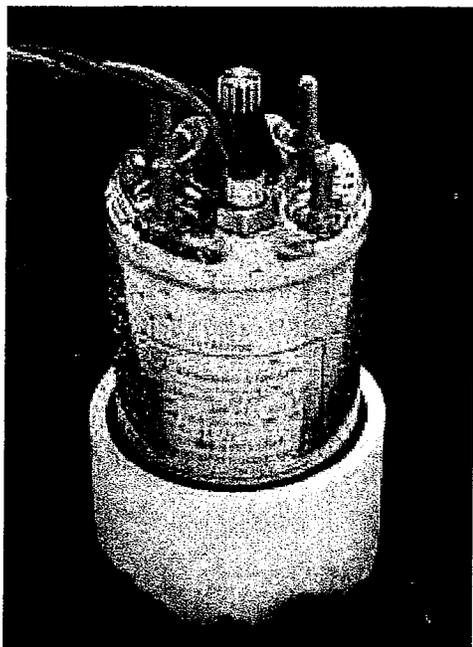
# **GunnCo Sidesloper™**

MODEL P2K MOTOR DATA 3.0 HP, 3/230V/60

<b>HORSE POWER</b>	:	<b>3.0 hp</b>
<b>PHASE</b>	:	<b>3</b>
<b>VOLTS</b>	:	<b>230 volts</b>
<b>FREQUENCY</b>	:	<b>60 Hz</b>
<b>SERVICE FACTOR</b>	:	<b>1.15</b>
<b>FULL LOAD AMPS</b>	:	<b>9.5 amps</b>
<b>AMPS @ SF</b>	:	<b>10.9 amps</b>

**Line to line Resistance** : **1.8 – 2.2 Ohms**

**Locked rotor amps** : **61.9 amps**



## 4" SUPER STAINLESS SUBMERSIBLE MOTORS

1/3 through 1 1/2 Hp - 2-wire: 1/3 through 3 Hp  
Single-phase 115, 230 volt-60 Hz; 220 volt-50 Hz;  
Three-phase 200, 230, 380, 460, 575 volt-60 Hz; 220, 380 volt-50 Hz

### APPLICATION DATA

These motors are built for dependable operation in 4" diameter or larger water wells. Continuous rating in 86°F (30°C) water. Rotation: Single phase, CCW facing shaft end; three phase electrically reversible.

*For further information, refer to Franklin Electric's "Submersible Motors: Application, Installation, Maintenance Manual."*

### SPECIAL FEATURES

- No flow inducer sleeve required in water up to 86°F (30°C) for motors through 2 Hp.
- Two-wire motors are split-phase designs with integral starting components and on-winding thermal overload protection, and do not require a control box. They feature FRANKLIN'S patented 2-wire BIAC starting switch which provides reverse impact torque to aid starting in adverse environments.
- Three-wire 60 Hz motors 1/3 - 1 Hp use FRANKLIN'S exclusive 3-wire QD (Quick-Disconnect) Control Box with the patented QD Relay. This relay provides the ultimate in operational life.

### BASIC FEATURES

- Corrosion-Resistant All Stainless Steel Exterior Construction
- Stainless Steel Splined Shaft
- Hermetically-Sealed Windings
- Anti-Track Self-Healing Resin System
- Water Lubrication
- Filter Check Valve
- Kingsbury-Type Thrust Bearing
- Pressure Equalizing Diaphragm
- Built-In Lightning Arrestors (all single-phase; 200 and 230 volt three-phase)
- Removable "Water-Bloc" Lead Installed In North American 60 Hz Water Well Motors. Consult Factory For Additional Leads.
- UL 778 Recognized (North American Voltages)
- CSA Certified
- ANSI/NSF 61 Certified
- NEMA Mounting Dimensions

**WARNINGS:** Serious or fatal electrical shock or fire hazard may result from failure to follow the instructions for proper installation and use which accompany this equipment. Do not use motor in swimming areas.



# Franklin Electric



# Application - Three-Phase Motors

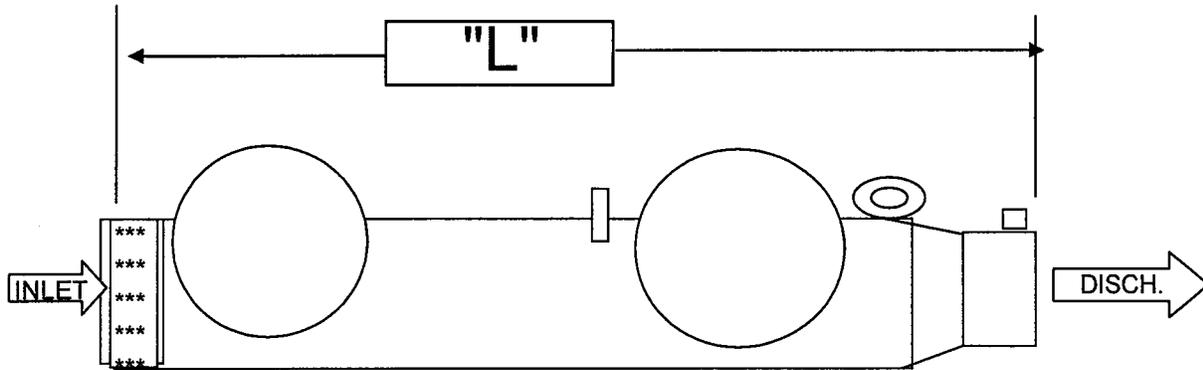
Table 22 Three-Phase Motor Specifications (60 Hz)

TYPE	MOTOR MODEL PREFIX	RATING					FULL LOAD		MAXIMUM (S.F. LOAD)		LINE TO LINE RESISTANCE OHMS	EFFICIENCY %		LOCKED ROTOR AMPS	KVA CODE
		HP	KW	VOLTS	HZ	S.F.	AMPS	WATTS	AMPS	WATTS		S.F.	FL		
4"	234501	1/2	0.37	200	60	1.6	2.8	585	3.4	860	6.6-8.4	70	64	17.5	N
	234511	1/2	0.37	230	60	1.6	2.4	585	2.9	860	9.5-10.9	70	64	15.2	N
	234541	1/2	0.37	380	60	1.6	1.4	585	2.1	860	23.2-28.6	70	64	9.2	N
	234521	1/2	0.37	460	60	1.6	1.2	585	1.5	860	38.4-44.1	70	64	7.6	N
	234502	3/4	0.55	200	60	1.5	3.6	810	4.4	1150	4.6-5.9	73	69	23.1	M
	234512	3/4	0.55	230	60	1.5	3.1	810	3.8	1150	6.8-7.8	73	69	20.1	M
	234542	3/4	0.55	380	60	1.5	1.9	810	2.5	1150	16.6-20.3	73	69	12.2	M
	234522	3/4	0.55	460	60	1.5	1.6	810	1.9	1150	27.2-30.9	73	69	10.7	M
	234503	1	0.75	200	60	1.4	4.5	1070	5.4	1440	3.8-4.5	72	70	30.9	M
	234513	1	0.75	230	60	1.4	3.9	1070	4.7	1440	4.9-5.6	72	70	26.9	M
	234543	1	0.75	380	60	1.4	2.3	1070	2.8	1440	12.2-14.9	72	70	16.3	M
	234523	1	0.75	460	60	1.4	2	1070	2.4	1440	19.9-23.0	72	70	13.5	M
	234504	1.5	1.1	200	60	1.3	5.8	1460	6.8	1890	2.5-3.0	76	76	38.2	K
	234514	1.5	1.1	230	60	1.3	5	1460	5.9	1890	3.2-4.0	76	76	33.2	K
	234544	1.5	1.1	380	60	1.3	3	1460	3.6	1890	8.5-10.4	76	76	20.1	K
	234524	1.5	1.1	460	60	1.3	2.5	1460	3.1	1890	13.0-16.0	76	76	16.6	K
	234534	1.5	1.1	575	60	1.3	2	1460	2.4	1890	20.3-25.0	76	76	13.3	K
	234305	2	1.5	200	60	1.25	7.7	2150	9.3	2700	1.8-2.4	69	69	53.6	L
	234315	2	1.5	230	60	1.25	6.7	2150	8.1	2700	2.3-3.0	69	69	46.6	L
	234345	2	1.5	380	60	1.25	4.1	2150	4.9	2700	6.6-8.2	69	69	28.2	L
	234325	2	1.5	460	60	1.25	3.4	2150	4.1	2700	9.2-12.0	69	69	23.3	L
	234335	2	1.5	575	60	1.25	2.7	2150	3.2	2700	14.6-18.7	69	69	18.6	L
	234306	3	2.2	200	60	1.15	10.9	2980	12.5	3420	1.3-1.7	75	75	71.2	K
	234316	3	2.2	230	60	1.15	9.5	2980	10.9	3420	1.8-2.2	75	75	61.9	K
	234346	3	2.2	380	60	1.15	5.8	2980	6.6	3420	4.7-6.0	75	75	37.5	K
	234326	3	2.2	460	60	1.15	4.8	2980	5.5	3420	7.2-8.8	75	75	31	K
	234336	3	2.2	575	60	1.15	3.8	2980	4.4	3420	11.4-13.9	75	75	24.8	K
	234307	5	3.7	200	60	1.15	18.3	5050	20.5	5810	7.4-9.1	74	74	122	K
	234317	5	3.7	230	60	1.15	15.9	5050	17.8	5810	1.0-1.2	74	74	106	K
	234347	5	3.7	380	60	1.15	9.6	5050	10.8	5810	2.9-3.6	74	74	64.4	K
	234327	5	3.7	460	60	1.15	8	5050	8.9	5810	4.0-4.9	74	74	53.2	K
	234337	5	3.7	575	60	1.15	6.4	5050	7.1	5810	6.4-7.8	74	74	42.6	K
234308	7.5	5.5	200	60	1.15	26.5	7360	30.5	8450	.46-.57	76	76	188	K	
234318	7.5	5.5	230	60	1.15	23	7360	26.4	8450	.61-.75	76	76	164	K	
234348	7.5	5.5	380	60	1.15	13.9	7360	16	8450	1.6-2.0	76	76	99.1	K	
234328	7.5	5.5	460	60	1.15	11.5	7360	13.2	8450	2.5-3.1	76	76	81.9	K	
234338	7.5	5.5	575	60	1.15	9.2	7360	10.6	8450	4.0-5.0	76	76	65.5	K	
234549	10	7.5	380	60	1.15	19.3	10000	21	11400	1.2-1.6	75	75	140	L	
234595	10	7.5	460	60	1.15	15.9	10000	17.3	11400	1.8-2.3	75	75	116	L	
234598	10	7.5	575	60	1.15	12.5	10000	13.6	11400	2.8-3.5	75	75	92.8	L	

# GunnCo Sidesloper™ Pump

Dimensional Data and Weights

P2K Models



Pump Model	"L" Max.	Discharge Size	Est. Weight	Pull Cable	
P2K-10 (ALL)	24"	*1.25"	50 pounds max.	1/8"	18" RISER
P2K-25 (ALL)	24"	1.5"	50 pounds max.	1/8"	
P2K-40-1/2/3	24"	2.0"	50 pounds max.	1/8"	
P2K-40-4/5	36"	2.0"	60 pound max.	1/8"	
P2K-40-6/7	42"	2.0"	60 pound max.	1/8"	
P2K-60-1/2/3/4	36"	2.0"	60 pound max.	1/8"	
P2K-60-5	42"	2.0"	90 pound max.	3/16"	
P2K-60-7	51"	2.0"	100 pound max.	3/16"	
P2K-75-1/2/3	36"	2.0"	60 pound max.	3/16"	
P2K-75-4/5	42"	2.0"	90 pound max.	3/16"	
P2K-75-8	60"	2.0"	100 pounds	1/4"	
P2K-85-1	36"	3.0"	75 pound max.	3/16"	24" RISER
P2K-85-2	46"	3.0"	100 pound max.	3/16"	
P2K-85-3/4	55"	3.0"	130 pound max.	3/16"	
P2K-150-1	36"	3.0"	90 pound max.	3/16"	
P2K-150-2	55"	3.0"	110 pound max.	3/16"	
P2K-150-3	60"	3.0"	140 pound max.	3/16"	
P2K-150-4	70"	3.0"	160 pounds max.	1/4"	
P2K-230-1	55"	3.0"	100 pound max.	3/16"	
P2K-230-2	60"	3.0"	160 pound max.	3/16"	
P2K-230-3	55"	3.0"	200 pound max.	3/16"	

\* Select 1.5" Discharge Hose.

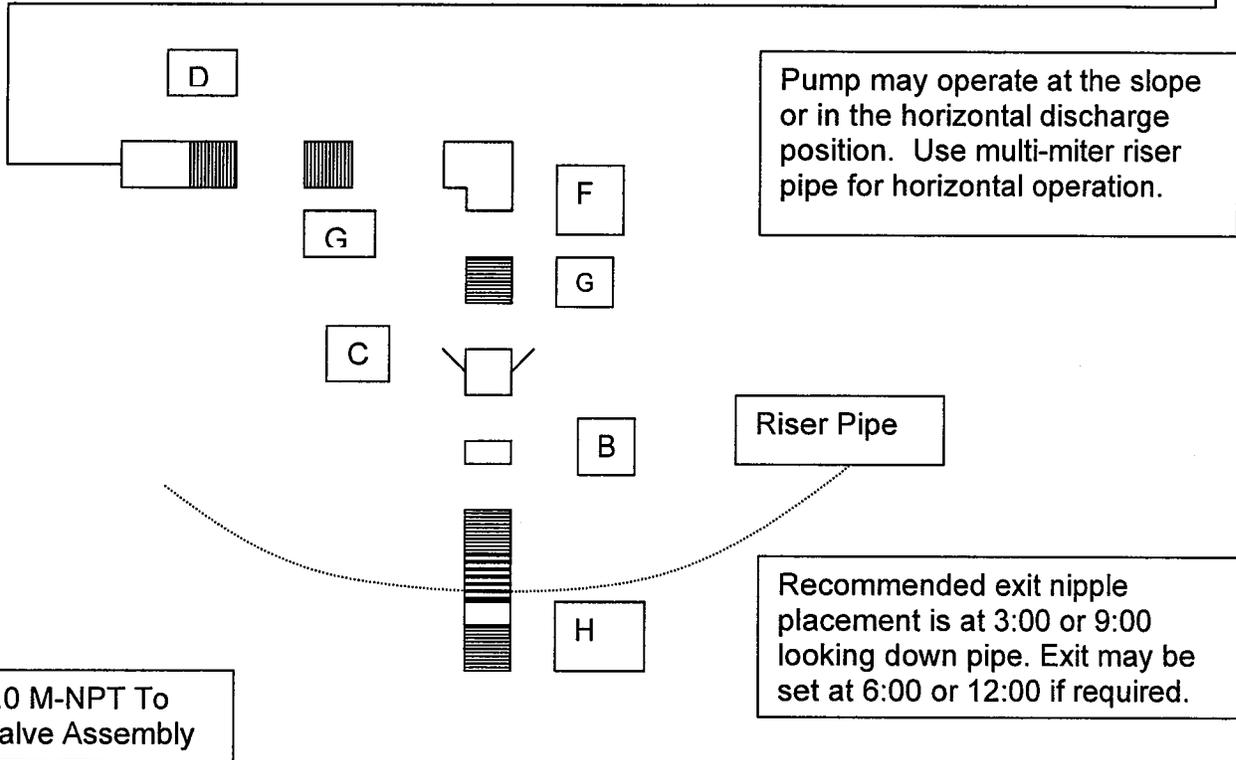
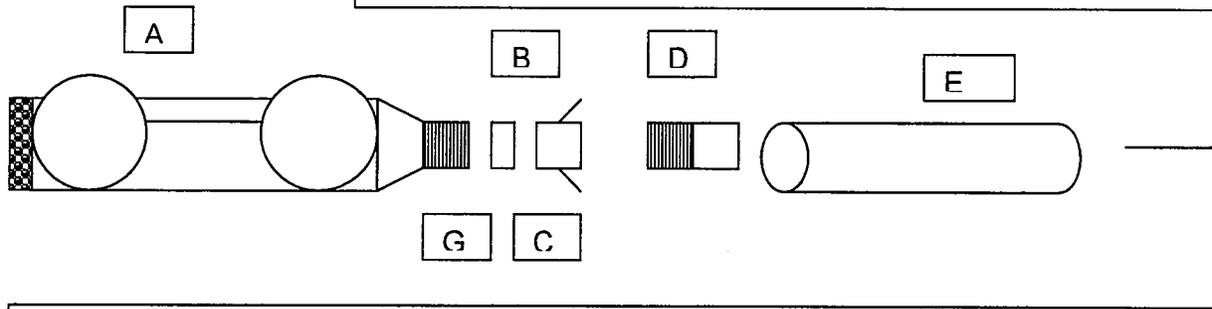
"L" Dimensions are maximum and may vary depending upon voltage and project requirements.

1/8" Pull Cable has 1760# breaking strength rating.

3/16" Pull Cable has 3700# breaking strength rating.

Optional 1/4" Pull Cable with 6400# breaking strength rating available.

Sidesloper Layout Assembly-detailed by components-



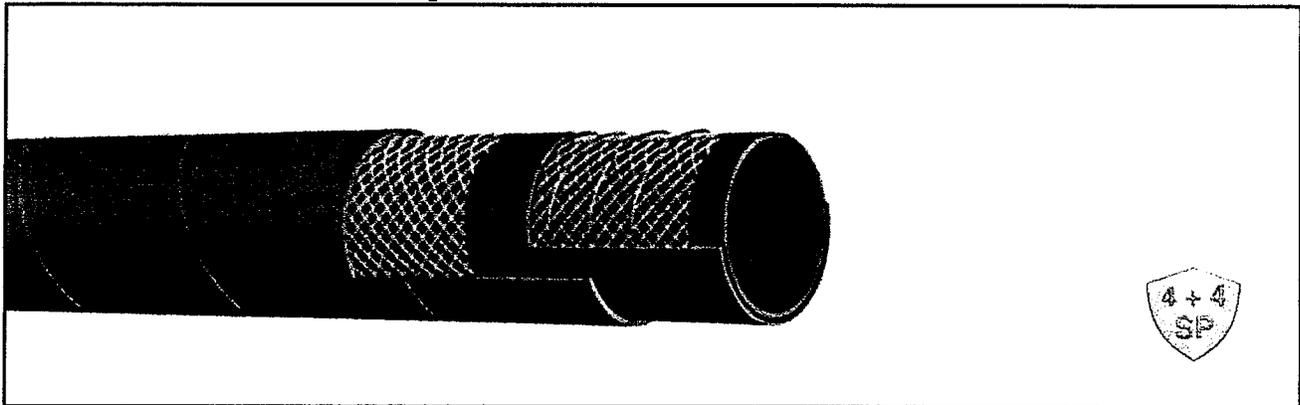
ITEM	QUANTITY	DESCRIPTION
A	1	Pump Assembly
B	2	Quick Coupler Type A 2" SS
C	2	Quick Coupler Type D 2" SS
D	2	2" SS Hose Shanks
E	125'	2" Hose
F	1	2.0" Elbow 90
G	3	2" Close Nipple SS
H	1	2.0" Exit Nipple

GunnCo Sidesloper 062006

## Troubleshooting

PROBLEM	CAUSE	CORRECTION
Pump does not produce flow or enough flow	Pump is rotating in the wrong direction (three phase pump only).	Reverse two legs of wiring and re-try.
	Pump is under sized for application.	Check pump size against actual system requirements.
	Pump is clogged.	Check pump inlet screen or for debris (sludge) in sump.
	Valve closed or hose/pipe pinched or collapsed.  Leaking or disconnected hose or pipe.	Inspect hose/piping and be sure all valves are opened.
	Pump has excessive wear or internal clogging or damage	Service Pump-inspect discharge port & impeller.
Pump will not start	Not enough liquid in well to start pump	Switch pump controller to "H" position
	No power at motor	Check incoming power/phase monitor and fuses.
	Power on but pump will not start-Contactor will not pull in	Check contactor coil-test in "H" Contact electrician to check
	Defective power cable/wiring	Test/inspect wiring
	Motor locked up	Inspect Pump Inlet & Check Impeller
Tripped overload, breaker, or blown fuse	Motor locked up	Check Pump/Rebuild if Required
	Short Circuit in cable or wiring	Inspect cable/wiring-replace as required.
	Blown transformer fuses	Test/replace transformer
	Low voltage or phase loss	Test incoming power (auto reset)
	New Fuses Blow	Confirm correct size fuses

## T202AA -150 PSI EPDM Multi-Purpose Water Suction Hose



### APPLICATION

Suction and delivery of non-corrosive liquids for irrigation, construction, fertilizers and lasso acid solutions.

### COVER

Black weather and ozone-resistant EPDM rubber.

### REINFORCEMENT

Spiralled high tensile textile cords and 4 highly flexible steel helix wires.

### TUBE

Black EPDM rubber.

### TEMPERATURE RANGE

-\_\_°F to 176°F

### STANDARD LENGTH

100 feet: 1" through 6" \_0, 50 feet: 5" \_0, \_5, 50 feet: 6" \_0, \_5 feet: 8"

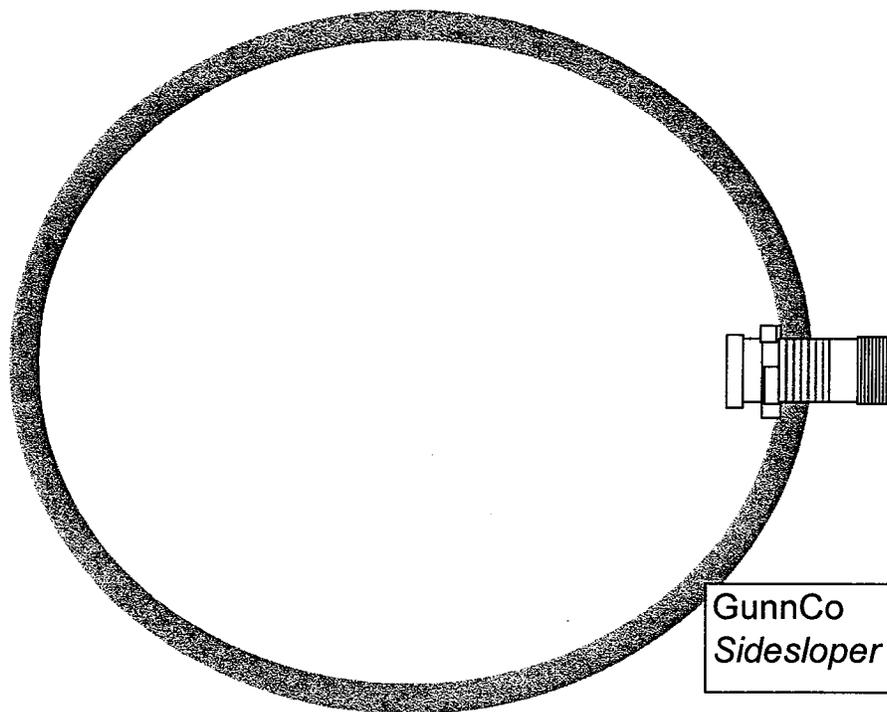
### BRANDING

ALFAGOMMA - ITALY - T\_0\_ 10 BAR (150 PSI)  
GENERAL PURPOSE EPDM (in green letters)

## Specifications

SERIES NO.	NOMINAL ID		NOMINAL OD		APPROX. WT. lbs./100 ft.	MAX. REC. WP (PSI)	MIN. BEND RADIUS (in.)
	(in.)	(mm)	(in.)	(mm)			
T202AA100	1	25	1.38	35	54	150	4
T202AA125	1 1/4	32	1.65	42	65	150	5
T202AA150	1 1/2	38	1.89	48	75	150	6
T202AA200	2	51	2.40	61	97	150	8
T202AA250	2 1/2	63	2.95	75	129	150	10
T202AA300	3	76	3.46	88	154	150	12
T202AA350	3 1/2	90	4.02	102	190	150	14
T202AA400	4	102	4.49	114	213	150	16
T202AA500	5	127	5.55	141	334	150	25
T202AA600	6	152	6.54	166	417	150	30

**COUPLING SUGGESTIONS** Cam and groove, pin lug, short shank couplings or combination nipples attached with single bolt, double bolt, wire or band type clamps.



GunnCo  
*Sidesloper*

## Exit Nipple Installation

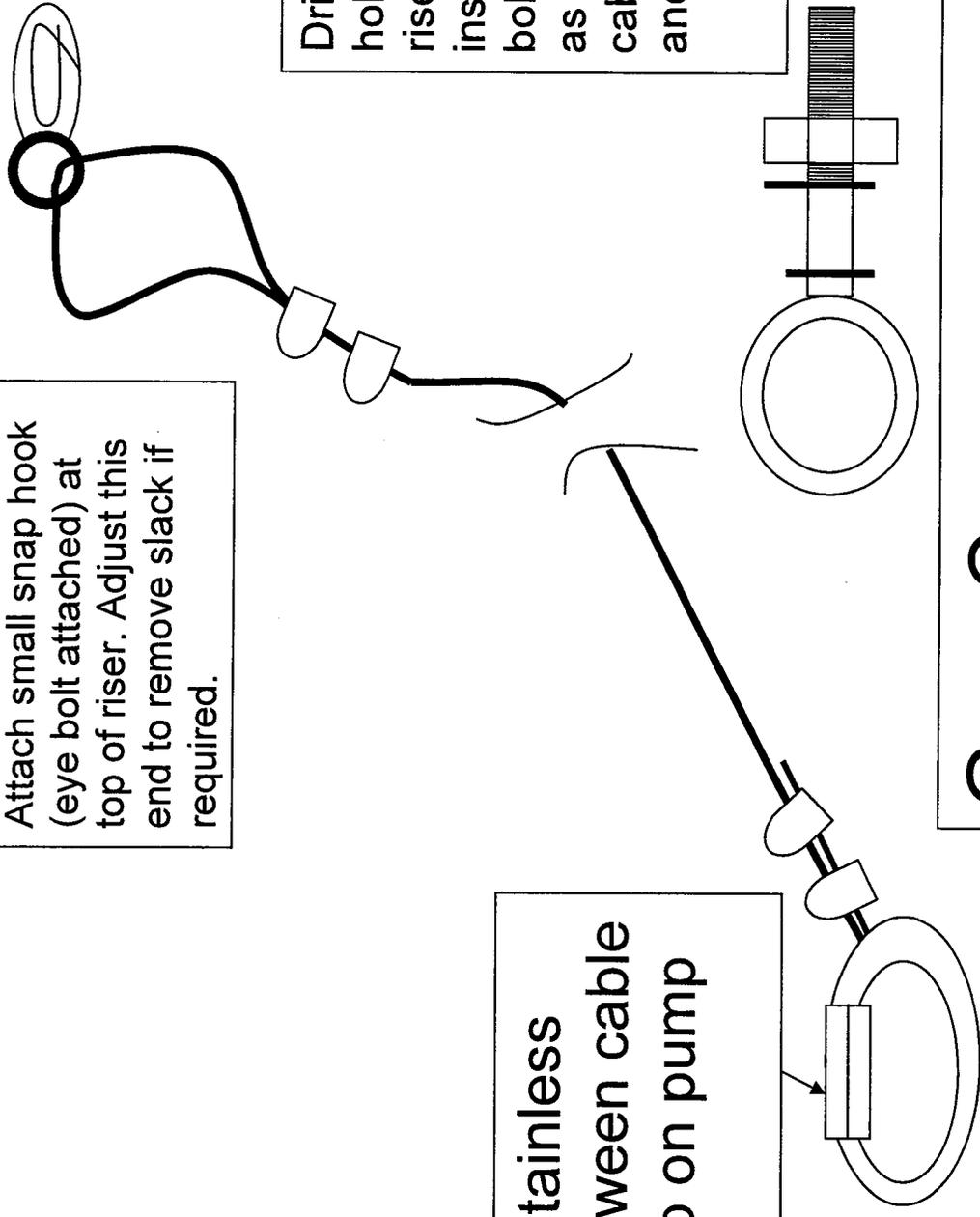
- 1) Drill hole to correct size at desired location.
- 2) Thread exit nipple into drilled hole. Hold at non-threaded boss area or attach end cap to turn. Extend into riser approximately 2".
- 3) Attach male cam & groove fitting- use thread paste.
- 4) Back up nipple until shoulder of cam & groove fitting is against inside of riser pipe wall.

GunnCo *Sidesloper Pumps* mbg1/2K

Attach small snap hook  
(eye bolt attached) at  
top of riser. Adjust this  
end to remove slack if  
required.

Drill 1/4"  
hole in  
rise to  
install eye  
bolt to use  
as pull  
cable  
anchor

Attach stainless  
loop between cable  
and loop on pump  
carrier



**GunnCo Sidesloper** Pumping System  
Pull Cable Attachment mbg 1/2000

# **Sidesloper™ PUMPING SYSTEM CONTROL**

## **OPERATION-SIMPLEX "GC" Series" 101 Panel**

The controller should provide automatic operation. Under normal conditions the pump should operate with the H-O-A switches in the A or automatic position.

### **EXTERIOR MOUNTED COMPONENTS:**

**Top Alarm Light**-(optional) Indicates HIGH liquid level condition. See individual indicators for cause.

**Duplex Receptacle**-(optional) Provides up to 5 amp 120v electrical service.

### **INTERIOR DOOR MOUNTED OPERATOR CONTROLS:**

**Main Breaker Disconnect Handle**-The main turns power off to the controller. This switch must be turned to the OFF position to open the interior door.

**H-O-A Switch** – The H-O-A switch should remain in the "A" setting for automatic operation. The "H" setting or hand is for testing only.

**Indicating Controller**-This device displays the level in the sump in inches and provides the pump ON/OFF and high-level ON/OFF operation. Check current setting or re-adjust set points as follows:

- 1) **PUMP OFF**-Turn center knob of the left to A-Reset. The current PUMP OFF set point will be displayed. To re-adjust use a small screw driver and turn the associated screw or "pot" until the desired set point is displayed.
- 2) **PUMP ON**- Turn center knob of the left to A-Set. The current PUMP ON set point will be displayed. To re-adjust use a small screw driver and turn the associated screw or "pot" until the desired set point is displayed. PLEASE NOTE: The pump will not start in the "A" position unless the level has surpassed the ON setting.
- 3) **HIGH ALARM OFF**-Turn center knob of the right to B-Reset. The current HIGH LEVEL OFF set point will be displayed. To re-adjust use a small screw driver and turn the associated screw or "pot" until the desired set point is displayed.
- 4) **HIGH ALARM ON**-Turn center knob of the right to B-Set. The current HIGH LEVEL ON set point will be displayed. To re-adjust use a small screw driver and turn the associated screw or "pot" until the desired set point is displayed.

LED is provided to indicate that the A or B relays are ON when lit. The level display will also flash during a high level condition. Pump ON and OFF settings should be sufficient difference to prevent pump rapid cycle-pump should not restart for 10 minutes or more (typically hours) after pump shuts off.

**Flow Meter (OPTION)**-The digital flow meter provides rate of flow (GPM-gallons per minute) on the upper/larger digits, and total accumulated flow (gallons) on the lower digits. Total may accumulate to 99999999 if the decimal point is eliminated. The right side arrow button resets the total to "0" when pressed. See flow meter instructions.

**RUN Light**-indicates pump is called to operate.

**PHASE or VOLTAGE FAULT/FAIL Light**-Indicates a phase loss, improper voltage, reversed phase (three phase only), blown sensor fuses damaged, or damaged voltage or phase sensor. Sensor is adjustable and should be set to actual operating voltage at the time of start-up.

**OVERLOAD Light**-Indicates a motor starter overload has occurred.

**HIGH LEVEL Light (OPTION)** Indicates a high level condition exists. Under this condition the level indicating display will flash.

**TANK FULL Light (OPTION)** -Indicates that the pump will not operate in the "A" mode because the panel is receiving a signal via a pair of wires that the remote storage tank or sump is full. Under this condition the pump will operate in the "H" mode.

**OVERLOAD Reset Button**-Reset the motor starter overload.

**ETM**-elapsed run time meters indicate hours of pump operation (to 1/10<sup>th</sup>). Under normal conditions hours of operation should be similar for each pump. This information can be recorded to determine estimated flows for the system.

**Breakers**-The motor, control, (and optional receptacle) breakers are accessible from the interior door. A tripped breaker typically indicates a short circuit. Please note that there are also fuses in the interior for the transformer or control power or optional receptacle. See additional information in interior components section.

**INTERIOR COMPONENTS:** Should be serviced with power off or by a qualified service personnel. NOTE: Power will be present in the incoming wiring to the main disconnect.

-----**ELECTRICAL HAZARD EXISTS!**-----

**Motor Breaker**-Three pole circuit breaker-typically located on upper far right is provided for the short circuit protection and allow service of the system. If a breaker trips check for a short circuit and reset. If the breaker trips again there may be an electrical problem which should be checked by a qualified electrician. Motor breaker switches off primary voltage to the motor starter contactors and pump.

**Control Breaker**-Single pole control circuit breaker-Typically located left position of the motor breaker is provided for the short circuit protection and allow service of the system. If a breaker trips check for a short circuit and reset. If the breaker trips again there may be an electrical problem which should be checked by a qualified electrician. There is also a fuse between the breaker and the control circuit. at the transformer which Control breaker switches off 120v control power to operator control components.

**Receptacle Breaker (OPTION)** -Single pole circuit breaker-Typically located far left position of the motor breaker is provided for the short circuit protection and protection of the system. There is also a fuse between the breaker and the receptacle which typically may blow due to overloaded circuit (limit usage to 5 amp service).

**Transformer and Fuses** (if applicable) – The transformer provides low 120 volt power for the control operations. There are three fuses mounted on top of the transformers, The upper two are the incoming power (230/460 volt) and the lower fuse is the control circuit power (120 volt). When replacing fuses use the identical type and rating as originally provided.

**Relays** ("ICE CUBE" relays)-These are plug in style relays which work between the level controller/H-O-A switch and the motor starter coil (and where applicable the high level lights) which minimizes the wear of the level controller contacts. Coil voltage is 120v.

**Motor Starter/Overload relay** -Contains overload protection and magnetic coil to energizes to allow power to the pump. Red bar resets overloads. Coil voltage is 120v.

**Voltage/Phase Monitor**- Plug in style device monitor incoming power and detects and protects motor from high or low voltage, loss of phase, or reversed phase (on three phase models). A led light indicates proper operation and adjustable knob allows for setting the unit to the normal operating voltage range. If the range exceeds approximately 10% of the set point the pump will be prevented from operating (motor starter coil will not pull in) until the problem is corrected. If the LED will not come on with adjustment check voltage and the associated fuses. High voltage surges may damage monitor. GunnCo normally stocks replacement units. At start-up the operating voltage should be set. Voltage must be within the range of the monitor. On three phase systems, if the unit will not energize at start-up after adjustment of range setting, the phases may need to be reversed at the monitor-to accomplish switch any two legs.

**ISB**-Intrinsically Safe Barrier-This devices provides a safety for the level control voltage and must be used to ensure safe operation where the sensor is in a hazardous location. The barrier contain two replaceable fuses.

**24VDC Power Supply (OPTION)**-Supplies power to the voltage meter. Plugs into socket.

**Lock Out Relay (OPTION)** –Provides sensing of a closed contact (float switch or relay) up to 5000' away through a pair of wires and provides panel pump lock out circuit function. Plugs into socket.

**Motor Saver (OPTION)**-Monitors motor load and provides protection for pump dry run, "dead head", and a variety of voltage and phase protection when the panel is in the "A" mode. A fault CODE is provided after a fault event is detected. May be programmed for specific protection category and ranges including short cycle (delay start), phase unbalance, high/low voltage, delay period before restart, and number of restarts after a fault. Typically programmed to provide backup overload and voltage protection. See instructions for programming and fault codes.

**Heater & Thermostat**-An enclosure heater is provided to minimize the formation of condensate within the enclosure to help ensure electrical components maintain minimum operating temperatures. The thermostat is adjustable but should typically be set around 90 for effective operation. If condensate continues to exist increase thermostat setting to 100 and/or check for sources of liquid into the enclosure.

**Bellows**-The panel is equipped with a bellow breather device which connects to the transducer breather to provide a closed venting loop to allow the transducer diaphragm to adjust.

**Surge Suppressor (110 Volt control circuit)**-provides protection to the control circuit if a surge condition occurs. An indicating light is on when operating properly.

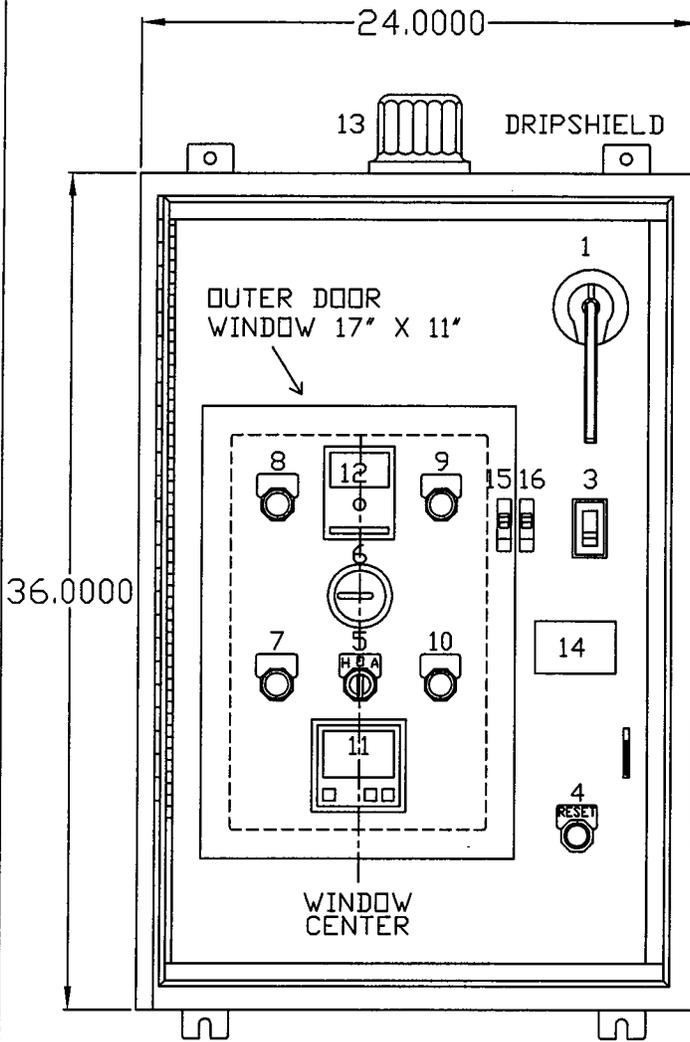
**Surge Suppressor (24V/4-20Ma)**-provide protection from surges entering panel from level sensor-Note that level sensor is also surge protected with an integral surge suppressor which is contained within the level sensor. If device damaged the signal between the sensor and the level indicating controller may will be lost and result in a negative level display of approximately -34.6. Also see ISB below.

**TVSS Transient Voltage Surge Suppressor Lightning Arrestor**-Square or rectangular device absorbs power line surges to protect the system. If the green LED light does not energize with power to the panel the unit may be no longer functional and replacement is required.

**Lightning Capacitor**-Cylinder Device mounted on the right of the enclosure. This device worked in conjunction to the Lightning Arrestor and is a "one shot" device, which absorbs high amperage line surges to protect the system. If a severe event occurs damage may be visual. If damaged the device should be immediate replaced. If damaged do not touch any exposed parts or wires.

Call GunnCo for assistance in operating and trouble shooting problems and for replacement parts or sources.

Our phone number is 770-889-7114.



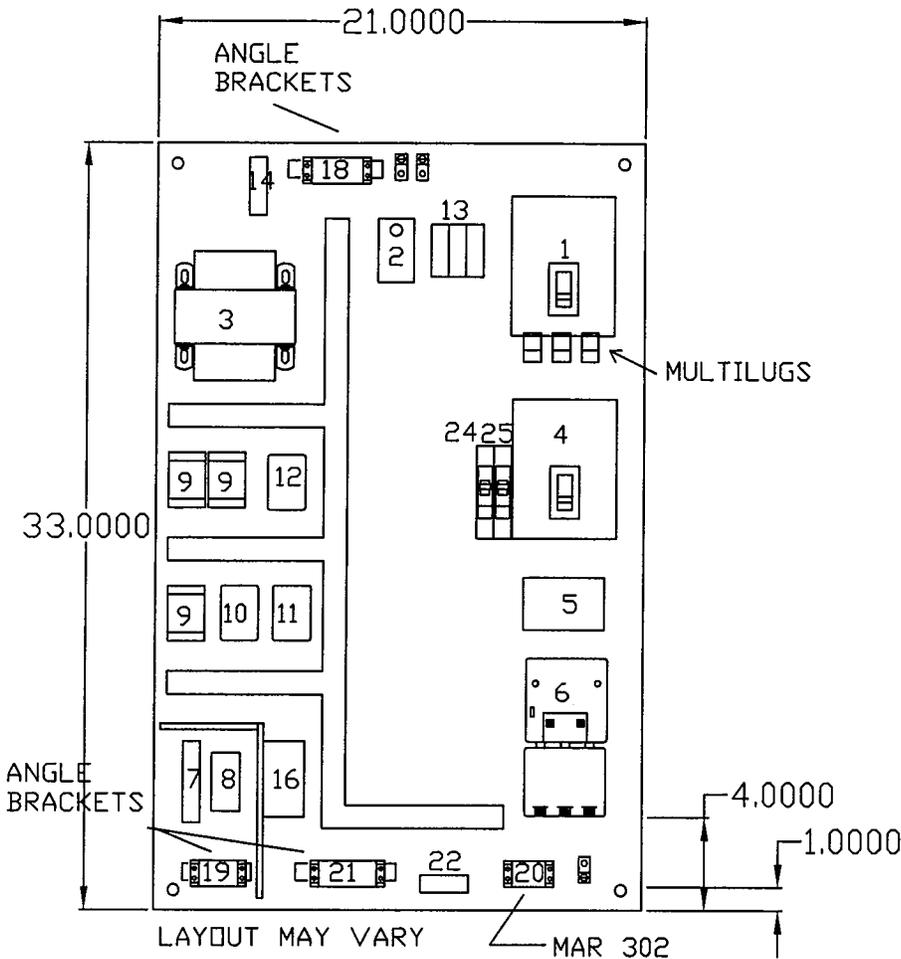
3PT LATCH ON  
OUTER DOOR

TERMINAL STRIP E  
ON BACK OF DF FOR  
OPTIONAL EQUIPMENT

OUTER DOOR HAS BEEN REMOVED FOR CLARITY

- 1 - MAIN BREAKER
- 2 - DUPLEX RECEPTACLE (GFI)
- 3 - MOTOR BREAKER
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- 6 - ELAPSE TIME METER
- 7 - RL1 PUMP RUN
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- 11 - FLOWMETER
- 12 - PUMP CONTROLLER
- 13 - AL ALARM LIGHT
- 14 - PUMP SAVER CUTOUT
- 15 - RECEPTACLE BREAKER
- 16 - CONTROL BREAKER

SIDESLOPER PUMPING SYSTEMS		EAST CAROLINA LANDFILL	
MODEL NO:	GCC-1.5-6-AACBCBB	<b>GUNNCO PUMP &amp; CONTROL</b> 125-E ENTERPRISE DRIVE CUMMING, GA 30040 TEL. 770-889-7114	
PROJECT:	EAST CAROLINA		
DATE:	11/20/2007		
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		 <b>66621BA</b>	



- 1 - MCB MAIN CIRCUIT BREAKER
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- 24 - DRB RECEPTACLE BREAKER
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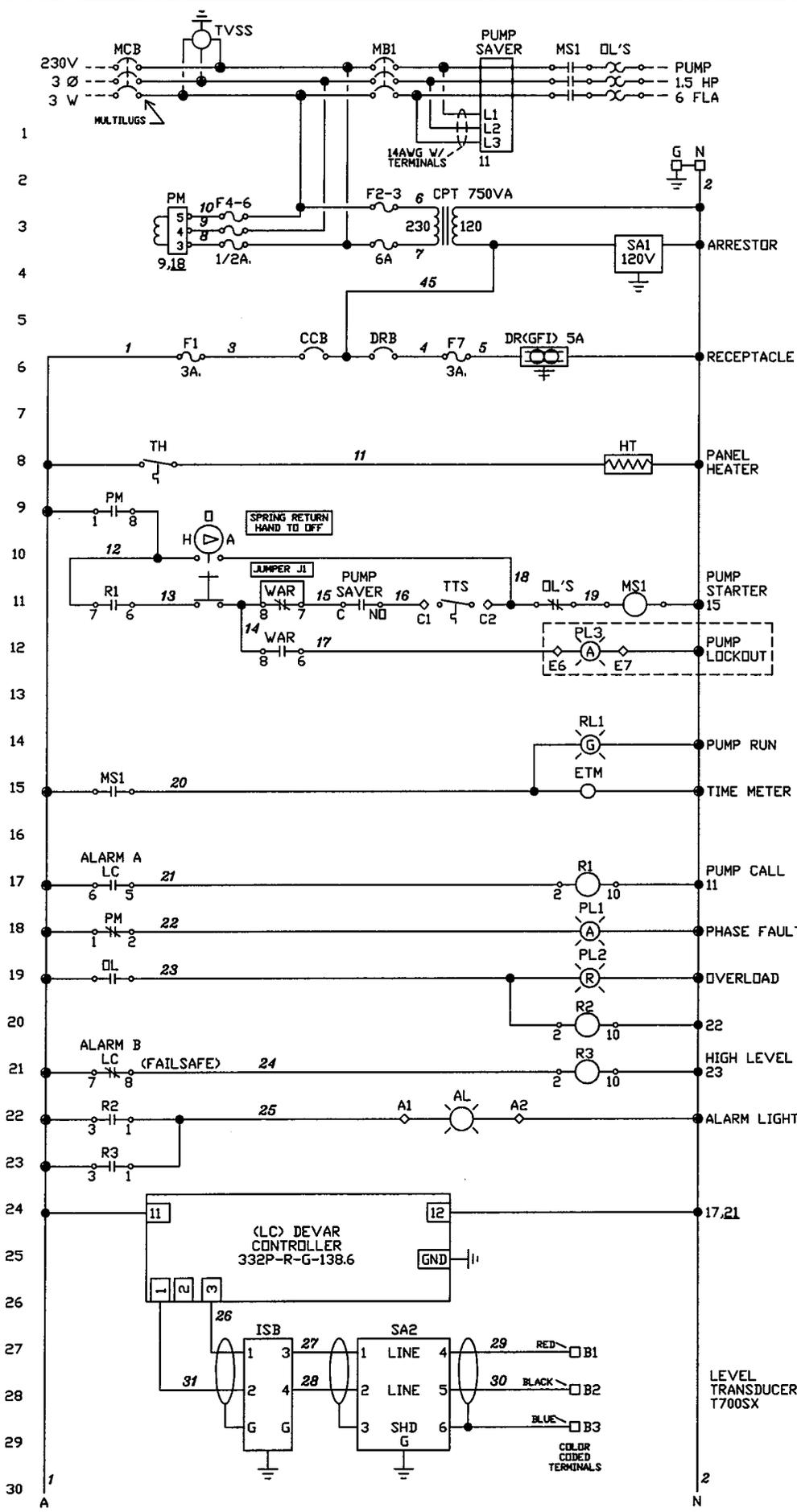
SIDESLOPER PUMPING SYSTEMS	
MODEL NO:	GCC-1.5-6-AACBCBB
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	REVISION:

EAST CAROLINA LANDFILL

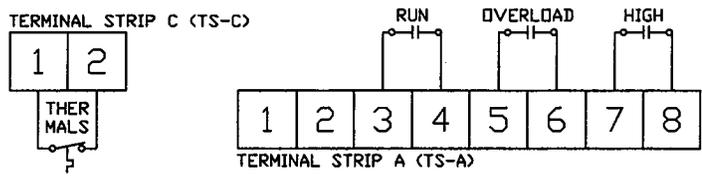
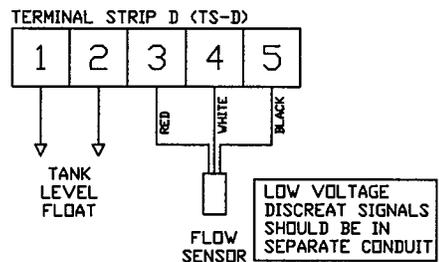
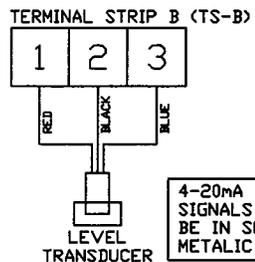
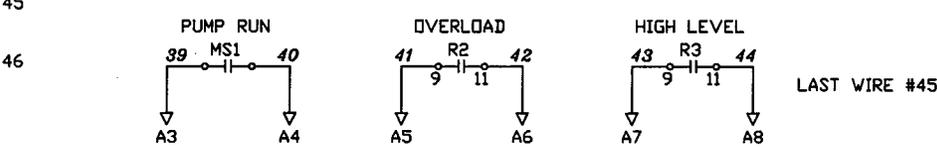
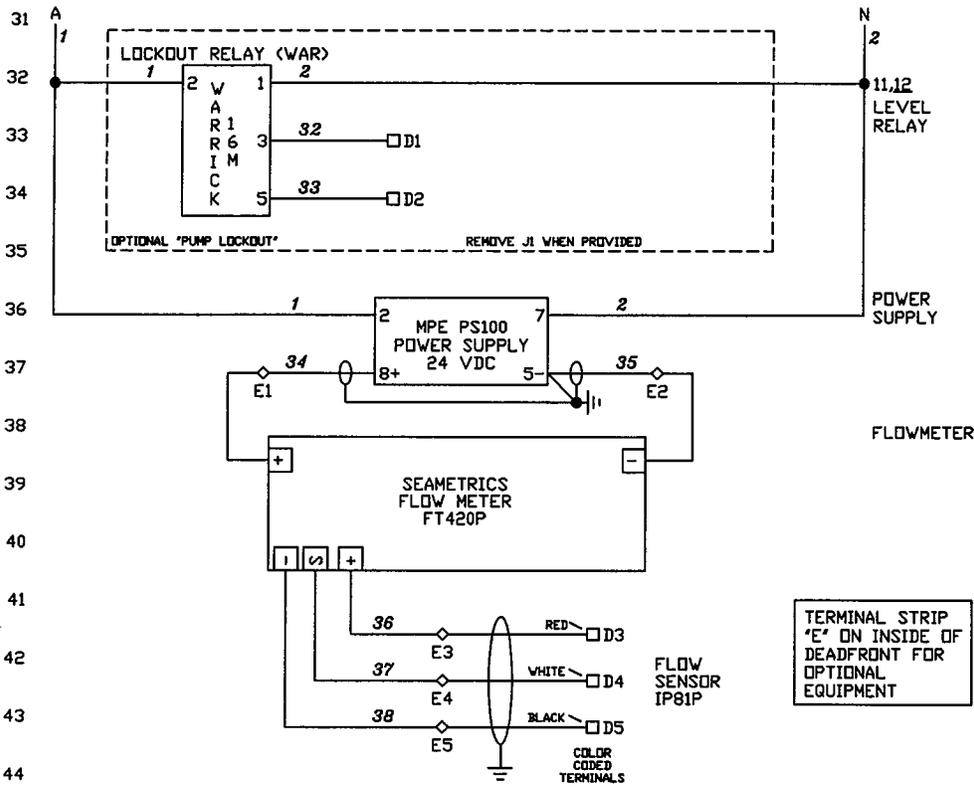
CUNNCO PUMP & CONTROL  
 125-E ENTERPRISE DRIVE  
 CUMMING, GA 30040  
 TEL. 770-889-7114

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<b>SIDESLOPER PUMPING SYSTEMS</b>	
<b>MODEL NO: GCC-1.5-6-AACBDB</b>	<b>PROJECT: EAST CAROLINA</b>
<b>DATE: 11/20/2007</b>	
<b>REVISION:</b>	
<b>EAST CAROLINA LANDFILL</b>	
<b>GUNCO PUMP &amp; CONTROL</b>	
125-E ENTERPRISE DRIVE CUMMING, GA 30040 TEL. 770-889-7114	
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<b>66621BA</b>	



	SERVICE WIRE	20 AMP	TABLE D
	GROUND WIRE	8 AWG	TABLE C
	TERMINAL 1	10 AWG	TABLE D
	TERMINAL 2	10 AWG	TABLE D
	TERMINAL 3	8 AWG	TABLE C
	TERMINAL 4	8 AWG	TABLE C
TERMINAL 5	8 AWG	TABLE C	

CUSTOMER			
JOB NAME	E. CAROLINA LANDFILL		
VOLTAGE	230V	PHASE 3	HZ 60
H.P.	#1 1.5	#2 -	#3 - #4 -
F.L.A.	6A	-	-
TOTAL F.L.A.	12A		
SERIAL #	07-	DATE:	11/20/2007

**SIDESLOPER PUMPING SYSTEMS**

MODEL NO: **GCC-1.5-6-AACBDB**

PROJECT: **EAST CAROLINA**

DATE: **11/20/2007**

REVISION:

**EAST CAROLINA LANDFILL**

**GUNNCO PUMP & CONTROL**

125-E ENTERPRISE DRIVE  
CUMMING, GA 30040  
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**TNT**

**66621BA**

# GUNNCO PUMP & CONTROL, INC

BILL OF MATERIAL					BY: TNT		
QUOTE NO.	66621BA			Date:	11/20/2007	Rev:	
JOB NAME	EAST CAROLINA LANDFILL				07-		
CUSTOMER					Po# 1781		
QTY	LEGEND	DESCRIPTION	MFG.	PART #	Check Off		
1		ENCLOSURE A-362410SSLP 3R12	HOFFMAN	LSJ022301STA - item 7	[ ]		
1		SUB PANEL	HOFFMAN	A-36P24	[ ]		
1		3 POINT LATCH (36"-48")	HOFFMAN	A-L36CR	[ ]		
1		WINDOW KIT (STAINLESS)	HOFFMAN	APWK1711NFSS	[ ]		
1	N	ISOLATED NEUTRAL BLOCK	SQD	SN12-125	[ ]		
2	G	GROUND BUSS	SQD	PK7GTA	[ ]		
1	MCB	MAIN CIRCUIT BREAKER	SQD	HDL36020	[ ]		
1		MULTI-LUG KITS (6-#14-#6)	SQD	PDC6HD6	[ ]		
1	OP M	OPERATOR MECHANISM 5-1/2" to 21-3/8 MOUNTING DEPTH (H or J - FRAME)	SQD	9421LZL250H43	[ ]		
1	MB	MOTOR BREAKER	SQD	HDL36015	[ ]		
1	CCB	CONTROL BREAKER	SQD	QOU115	[ ]		
1	DRB	RECEPTACLE BREAKER	SQD	QOU115	[ ]		
1	MS	MOTOR STARTER (SIZE 0)	SQD	8536-SBO2V02S	[ ]		
3	OL	OVERLOAD HEATERS	SQD	B14	[ ]		
1		MS AUXILIARY CONTACTS (NO)	SQD	9999-SX6	[ ]		
1		OL AUXILIARY CONTACTS (NC, NO)	SQD	9999-SO4	[ ]		
1	OL R	OVERLOAD RESET	SQD	9066-RA1	[ ]		
1	AL	ALARM LIGHT (STROBE)	FEDERAL SIGNAL	LP3M-120R	[ ]		
1	* DR	DUPLEX RECEPTACLE	PASS & SEY.	2091-I	[ ]		
1		WEATHER PROOF COVER (AL)	BWF	FGV-1DCV (GREY)	[ ]		
2		ANGLE BRACKET KIT	SQD	9080MH82	[ ]		
8	TS	TERMINAL STRIP (NATURAL)	SQD	9080-GK6	[ ]		
2	TS	TERMINAL STRIP (RED)	SQD	9080-GKR6	[ ]		
2	TS	TERMINAL STRIP (BLACK)	SQD	9080-GKB6	[ ]		
1	TS	TERMINAL STRIP (BLUE)	SQD	9080-GKL6	[ ]		
1	TS	TERMINAL STRIP (GREEN)	SQD	9080-GKG6	[ ]		
3	TS	TERMINAL STRIP END BARRIER	SQD	9080-GK6B	[ ]		
1	TS	TERMINAL STRIP	MARATHON	SERIES 200	[ ]		
2	* F1, 7	FUSE	LITTELFUSE	KLDR -3 /600V	[ ]		
2	* F2-3	FUSE	LITTELFUSE	KLDR-6 /600V	[ ]		
3	* F4-6	FUSE	LITTELFUSE	KLDR -1/2 /600V	[ ]		
2		FUSE BLOCK W/ BLOWN FUSE INDICATOR	FERRAZ SHAWMUT	USCC1I	[ ]		
1		FUSE BLOCK W/ BLOWN FUSE INDICATOR	FERRAZ SHAWMUT	USCC2I	[ ]		
1		FUSE BLOCK W/ BLOWN FUSE INDICATOR	FERRAZ SHAWMUT	USCC3I	[ ]		
1	CPT	CONTROL POWER TRANSFORMER	SQD	9070-TF750D1	[ ]		
1	HOA	HAND-OFF-AUTO SELECTOR	SQD	9001SKS63B	[ ]		
1		(NO, NC) CONTACT	SQD	9001-KA1	[ ]		
1	RL	RUN LIGHT	SQD	9001SKP1	[ ]		
2	PL	PILOT LIGHT	SQD	9001SKP1	[ ]		
1	ETM	ELAPSED TIME METER	REDINGTON	710-0002	[ ]		
3	R	CONTROL RELAY (120VAC W/PL)	SQD	8501KP13P14V20	[ ]		

3		11 PIN SOCKET	IDEC	SR3P-05	[ ]
1		8 PIN SOCKET 600V	CUSTOM CONN	RB08	[ ]
1		12 PIN SOCKET 600V	CUSTOM CONN	SD12	[ ]
1	TH	THERMOSTAT	BILBEE	S200-A	[ ]
1	HT	HEATER	HEATRON	HEATFLEX	[ ]
1	VC	VAPOR CAPSULE	ZERUST	VCC-1	[ ]

NOTES: \* OR EQUAL  
SPECIAL ITEMS IN BOLD TYPE

### PACKING LIST

Quote#: 66621BA	Date: 11/20/2007	Rev:
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#### SPARE PARTS

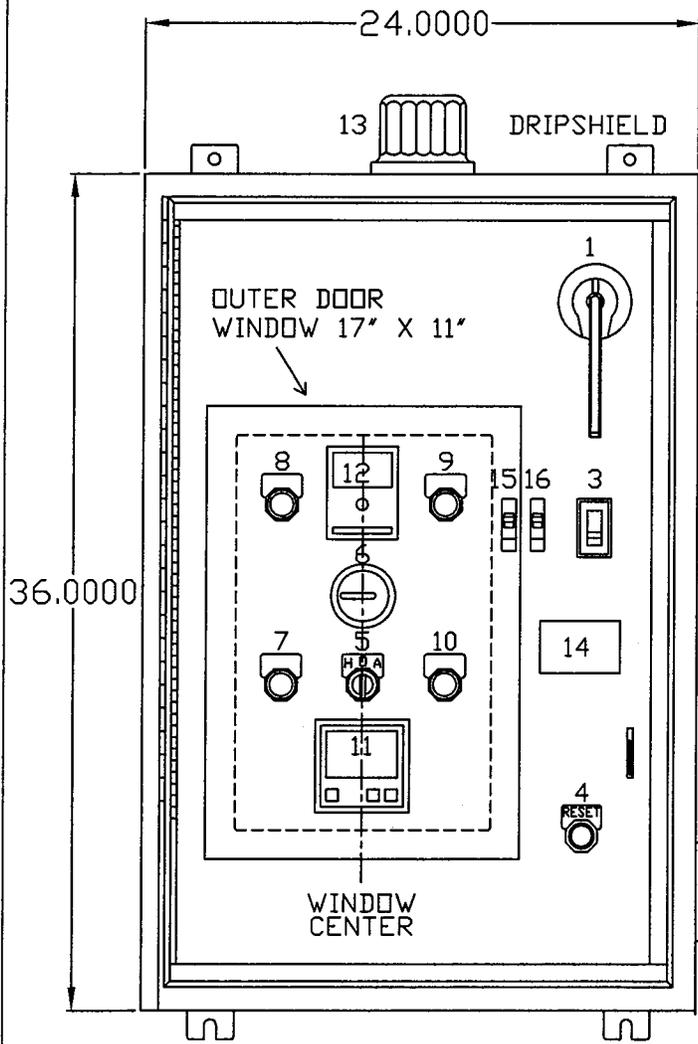
QTY	LEGEND	DESCRIPTION	MFG	PART #	
2	* F1, 7	FUSE	LITTELFUSE	KLDR -3 /600V	[ ]
2	* F2-3	FUSE	LITTELFUSE	KLDR-3 /600V	[ ]
3	* F4-6	FUSE	LITTELFUSE	KLDR -1/2 /600V	[ ]
1		LIGHT BULB	SYLVANIA	755	[ ]

#### PARTS PROVIDED FOR PANEL INSTALLATION

QTY	LEGEND	DESCRIPTION	MFG	PART #	
1		MOTOR SAVER	SYMCOM	PS777-LR	[ ]
1	LC	LEVEL CONTROLLER	DEVAR	332P-R-G-138.6	[ ]
1	FM	FLOW METER	SEAMETRICS	FT420P	[ ]
1		BREATHER	PRESSURE SYSTEMS	A-815	[ ]
1	PS	POWER SUPPLY	MPE	PS100	[ ]
1	PM	PHASE MONITOR	MPE	001-440-118	[ ]
1	ISB	INTRINSICALLY SAFE BARRIER (XD)	STAHL	9002/13-280-110-01	[ ]
1	SA	SURGE ARRESTOR	EDCO	FAS-120	[ ]
1	SA	SURGE ARRESTOR	EDCO	DRS036	[ ]

#### PARTS PROVIDED

QTY	LEGEND	DESCRIPTION	MFG	PART #	
1		LEVEL TRANSDUCER	DEVAR	T700SX	[ ]
1		FLOW SENSOR	SEAMETRICS	IP81P	[ ]



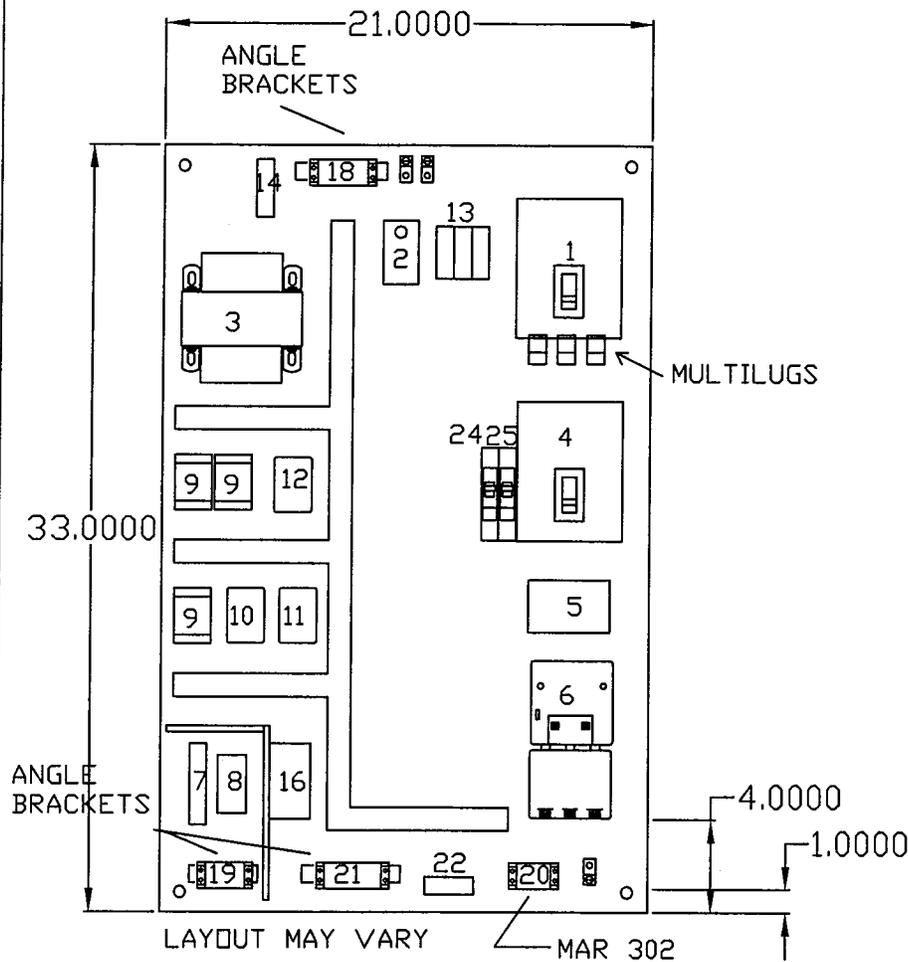
3PT LATCH ON  
OUTER DOOR

TERMINAL STRIP E  
ON BACK OF DF FOR  
OPTIONAL EQUIPMENT

OUTER DOOR HAS BEEN REMOVED FOR CLARITY

- 1 - MAIN BREAKER
- 2 - DUPLEX RECEPTACLE (GFI)
- 3 - MOTOR BREAKER
- 4 - OVERLOAD RESET
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- 6 - ELAPSE TIME METER
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- 8 - PL1 PHASE FAIL
- 9 - PL2 OVERLOAD
- 10 - PL3 PUMP LOCKOUT (OPTIONAL)
- 11 - FLOWMETER
- 12 - PUMP CONTROLLER
- 13 - AL ALARM LIGHT
- 14 - PUMP SAVER CUTOUT
- 15 - RECEPTACLE BREAKER
- 16 - CONTROL BREAKER

EAST CAROLINA LANDFILL		SIDESLOPER PUMPING SYSTEMS
GUNNCO PUMP & CONTROL 125-E ENTERPRISE DRIVE CUMMING, GA 30040 TEL. 770-889-7114		MODEL NO: GCC-3-11-AACBCBB
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		DATE: 11/20/2007
TNT		REVISION:
66621AA		



- 1 - MCB MAIN CIRCUIT BREAKER
- 2 - SA1 SURGE ARRESTOR 120V
- 3 - CPT CONTROL POWER TRANSFORMER
- 4 - MB1 MOTOR BREAKER 1
- 5 - MOTOR SAVER
- 6 - MS1 MOTOR STARTER 1
- 7 - ISB INTRINSICALLY SAFE BARRIER
- 8 - SA2 SURGE ARRESTOR 4-20MA
- 9 - R1 TO R4 CONTROL RELAY
- 10 - WAR LEVEL RELAY (OPTIONAL)
- 11 - PS POWER SUPPLY
- 12 - VM PHASE MONITOR
- 13 - F FUSE BLOCK
- 14 - TH THERMOSTAT
- 15 -
- 16 - TRANSDUCER BREATHER
- 17 -
- 18 - TSA TERMINAL STRIP A
- 19 - TSB TERMINAL STRIP B
- 20 - TSC TERMINAL STRIP C
- 21 - TSD TERMINAL STRIP D
- 22 - HT HEATER STRIP
- 23 -
- 24 - DRB RECEPTACLE BREAKER
- 25 - CCB CONTROL BREAKER

<b>SIDESLOPER PUMPING SYSTEMS</b>	
<b>MODEL NO:</b>	<b>GCC-3-11-AACB</b>
<b>PROJECT:</b>	<b>EAST CAROLINA</b>
<b>DATE:</b>	<b>11/20/2007</b>
	<b>REVISION:</b>

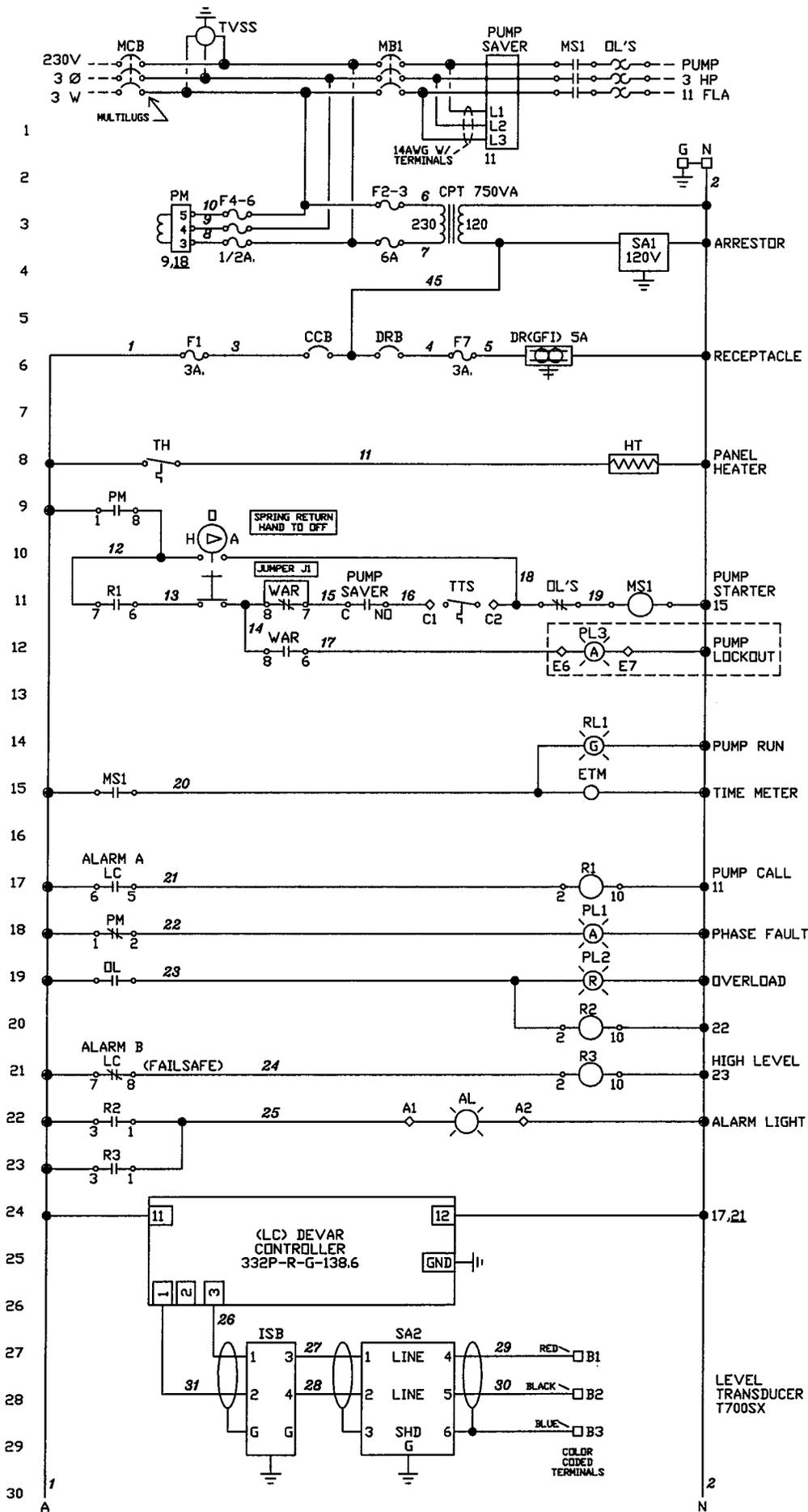
**EAST CAROLINA LANDFILL**

**GUNNCO PUMP & CONTROL**  
**125-E ENTERPRISE DRIVE**  
**CUMMING, CA 30040**  
**TEL. 770-889-7114**

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**TNT**

**666214A**



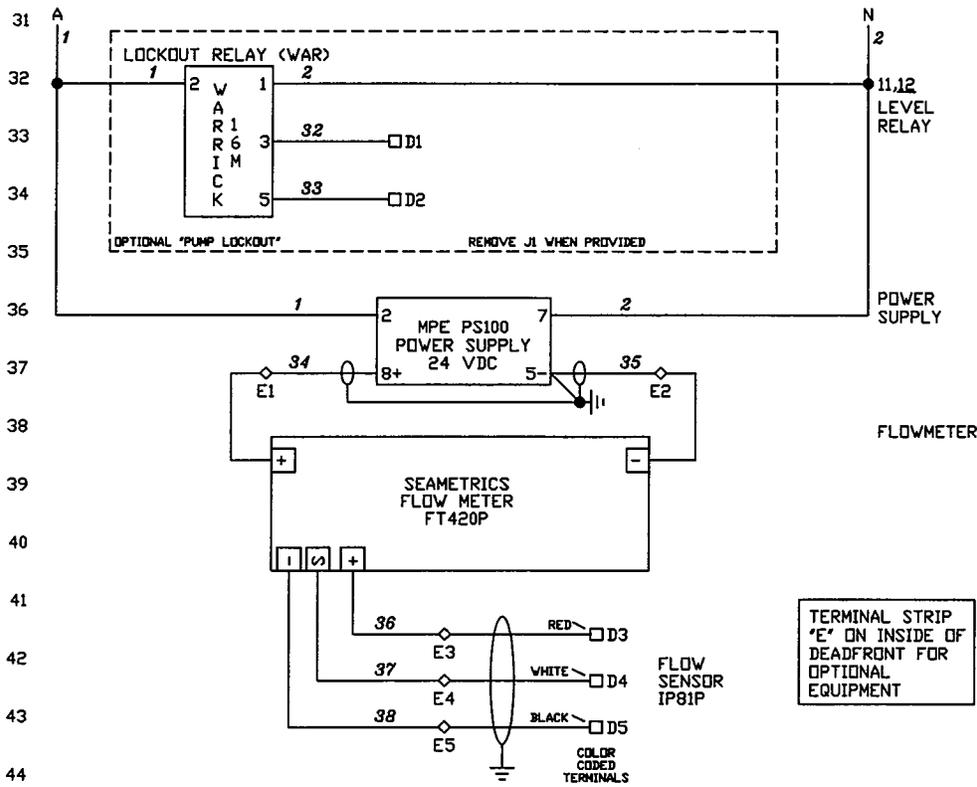
<b>SIDESLOPER PUMPING SYSTEMS</b>	
<b>MODEL NO:</b>	<b>GCC-3-11-AACBCBB</b>
<b>PROJECT:</b>	<b>EAST CAROLINA</b>
<b>DATE:</b>	<b>11/20/2007</b>
	<b>REVISION:</b>

**EAST CAROLINA LANDFILL**

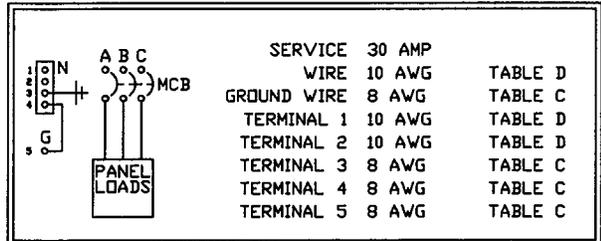
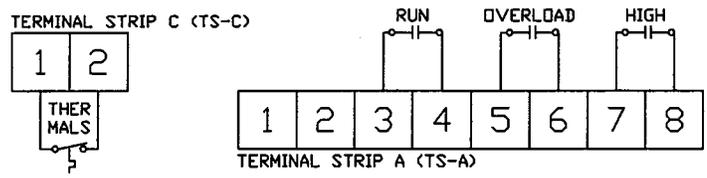
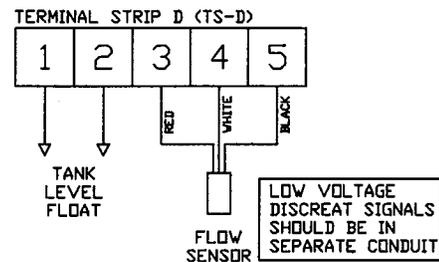
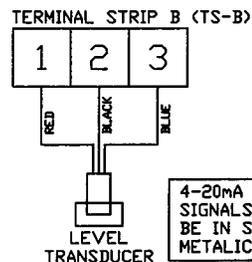
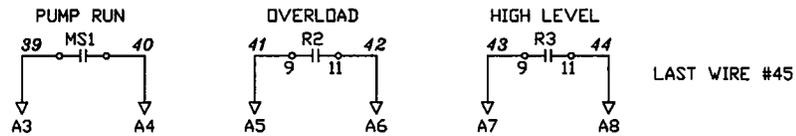
**GUNNCO PUMP & CONTROL**  
 125-E ENTERPRISE DRIVE  
 CUMMING, GA 30040  
 TEL. 770-889-7114

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**TNT**  
**66621AA**



TERMINAL STRIP "E" ON INSIDE OF DEADFRONT FOR OPTIONAL EQUIPMENT



CUSTOMER			
JOB NAME	E. CAROLINA LANDFILL		
VOLTAGE	230V	PHASE 3	HZ 60
H.P.	#1 3	#2 -	#3 - #4 -
F.L.A.	11	-	-
TOTAL F.L.A.	17A		
SERIAL #	07-	DATE:	11/20/2007

SIDESLOPER PUMPING SYSTEMS  
 MODEL NO: GCC-3-11-AACBCBB  
 PROJECT: EAST CAROLINA  
 DATE: 11/20/2007  
 REVISION:

EAST CAROLINA LANDFILL  
 GUNNCO PUMP & CONTROL  
 125-E ENTERPRISE DRIVE  
 CUMMING, GA 30040  
 TEL. 770-889-7114

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TNT  
 66621AA

# GUNNCO PUMP & CONTROL, INC

BILL OF MATERIAL				BY: TNT	
QUOTE NO.		66621AA		Date: 11/20/2007	
JOB NAME		EAST CAROLINA LANDFILL		07-	
CUSTOMER				Po# 1781	
QTY	LEGEND	DESCRIPTION	MFG.	PART #	Check Off
1		ENCLOSURE A-362410SSLP 3R12	HOFFMAN	LSJ022301STA - item 7	[ ]
1		SUB PANEL	HOFFMAN	A-36P24	[ ]
1		3 POINT LATCH (36"-48")	HOFFMAN	A-L36CR	[ ]
1		WINDOW KIT (STAINLESS)	HOFFMAN	APWK1711NFSS	[ ]
1	N	ISOLATED NEUTRAL BLOCK	SQD	SN12-125	[ ]
2	G	GROUND BUSS	SQD	PK7GTA	[ ]
1	MCB	MAIN CIRCUIT BREAKER	SQD	HDL36030	[ ]
2		MULTI-LUG KITS (6-#14-#6)	SQD	PDC6HD6	[ ]
2	OP M	OPERATOR MECHANISM 5-1/2" to 10-3/4 MOUNTING DEPTH (H or J - FRAME)	SQD	9421LZ250H43	[ ]
1	MB	MOTOR BREAKER	SQD	HDL36015	[ ]
1	CCB	CONTROL BREAKER	SQD	QOU115	[ ]
1	DRB	RECEPTACLE BREAKER	SQD	QOU115	[ ]
1	MS	MOTOR STARTER (SIZE 0)	SQD	8536-SBO2V02S	[ ]
3	OL	OVERLOAD HEATERS	SQD	B14	[ ]
1		MS AUXILIARY CONTACTS (NO)	SQD	9999-SX6	[ ]
1		OL AUXILIARY CONTACTS (NC, NO)	SQD	9999-SO4	[ ]
1	OL R	OVERLOAD RESET	SQD	9066-RA1	[ ]
1	AL	ALARM LIGHT (STROBE)	FEDERAL SIGNAL	LP3M-120R	[ ]
1	* DR	DUPLEX RECEPTACLE	PASS & SEY.	2091-I	[ ]
1		WEATHER PROOF COVER (AL)	BWF	FGV-1DCV (GREY)	[ ]
2		ANGLE BRACKET KIT	SQD	9080MH82	[ ]
8	TS	TERMINAL STRIP (NATURAL)	SQD	9080-GK6	[ ]
2	TS	TERMINAL STRIP (RED)	SQD	9080-GKR6	[ ]
2	TS	TERMINAL STRIP (BLACK)	SQD	9080-GKB6	[ ]
1	TS	TERMINAL STRIP (BLUE)	SQD	9080-GKL6	[ ]
3	TS	TERMINAL STRIP END BARRIER	SQD	9080-GK6B	[ ]
1	TS	TERMINAL STRIP	MARATHON	SERIES 200	[ ]
2	* F1, 7	FUSE	LITTELFUSE	KLDR -3 /600V	[ ]
2	* F2-3	FUSE	LITTELFUSE	KLDR-3 /600V	[ ]
3	* F4-6	FUSE	LITTELFUSE	KLDR -1/2 /600V	[ ]
2		FUSE BLOCK W/ BLOWN FUSE INDICATOR	FERRAZ SHAWMUT	USCC1I	[ ]
1		FUSE BLOCK W/ BLOWN FUSE INDICATOR	FERRAZ SHAWMUT	USCC2I	[ ]
1		FUSE BLOCK W/ BLOWN FUSE INDICATOR	FERRAZ SHAWMUT	USCC3I	[ ]
1	CPT	CONTROL POWER TRANSFORMER	SQD	9070-TF750D1	[ ]
1	HOA	HAND-OFF-AUTO SELECTOR	SQD	9001SKS63B	[ ]
1		(NO, NC) CONTACT	SQD	9001-KA1	[ ]
1	RL	RUN LIGHT	SQD	9001SKP1	[ ]
2	PL	PILOT LIGHT	SQD	9001SKP1	[ ]
1	ETM	ELAPSED TIME METER	REDINGTON	710-0002	[ ]
3	R	CONTROL RELAY (120VAC W/PL)	SQD	8501KP13P14V20	[ ]
3		11 PIN SOCKET	IDEC	SR3P-05	[ ]

1		8 PIN SOCKET 600V	CUSTOM CONN	RB08	[ ]
1		12 PIN SOCKET 600V	CUSTOM CONN	SD12	[ ]
1	TH	THERMOSTAT	BILBEE	S200-A	[ ]
1	HT	HEATER	HEATRON	HEATFLEX	[ ]
1	VC	VAPOR CAPSULE	ZERUST	VCC-1	[ ]

NOTES: \* OR EQUAL  
SPECIAL ITEMS IN BOLD TYPE

### PACKING LIST

Quote#: 66621AA	Date: 11/20/2007	Rev:
-----------------	------------------	------

#### SPARE PARTS

QTY	LEGEND	DESCRIPTION	MFG	PART #	
2	* F1, 7	FUSE	LITTELFUSE	KLDR -3 /600V	[ ]
2	* F2-3	FUSE	LITTELFUSE	KLDR-3 /600V	[ ]
3	* F4-6	FUSE	LITTELFUSE	KLDR -1/2 /600V	[ ]
1		LIGHT BULB	SYLVANIA	755	[ ]

#### PARTS PROVIDED FOR PANEL INSTALLATION

QTY	LEGEND	DESCRIPTION	MFG	PART #	
1		MOTOR SAVER	SYMCOM	PS777-LR	[ ]
1	LC	LEVEL CONTROLLER	DEVAR	332P-R-G-138.6	[ ]
1	FM	FLOW METER	SEAMETRICS	FT420P	[ ]
1		BREATHHER	PRESSURE SYSTEMS	A-815	[ ]
1	PS	POWER SUPPLY	MPE	PS100	[ ]
1	PM	PHASE MONITOR	MPE	001-440-118	[ ]
1	ISB	INTRINSICALLY SAFE BARRIER (XD)	STAHL	9002/13-280-110-01	[ ]
1	SA	SURGE ARRESTOR	EDCO	FAS-120	[ ]
1	SA	SURGE ARRESTOR	EDCO	DRS036	[ ]

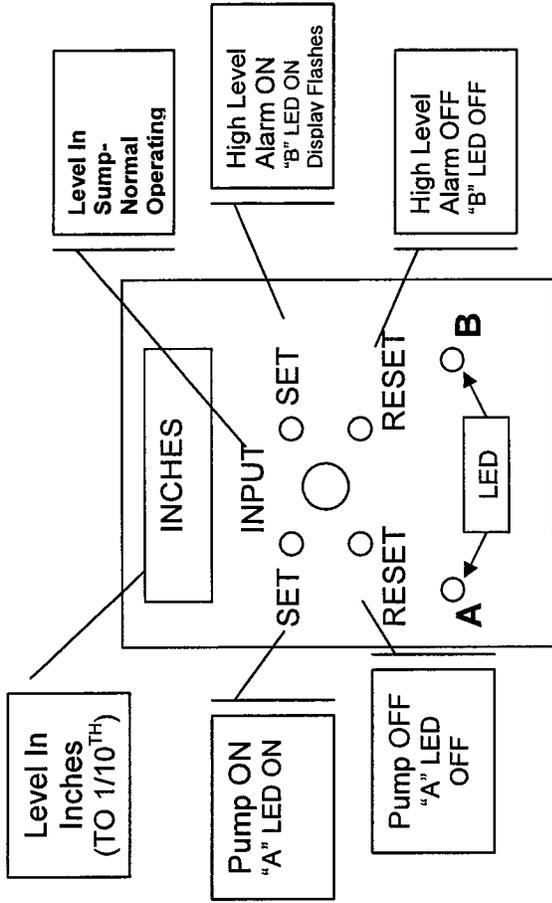
#### PARTS PROVIDED

QTY	LEGEND	DESCRIPTION	MFG	PART #	
1		LEVEL TRANSDUCER	DEVAR	T700SX	[ ]
1		FLOW SENSOR	SEAMETRICS	IP81P	[ ]

The differential between PUMP ON and PUMP OFF must allow at least 10 minutes between starts to prevent early (and non-warranty) motor failure. In some installation the pump may produce greater flow than the perforations of the riser pipe allow the pipe sump area to recharge. Under these conditions it is available to maximize the ON-OFF settings-Typically we suggest setting PUMP OFF to 6" and PUMP ON to 24" or above. Call GunnCo for details.

**Typically:**  
 PUMP OFF (A-RESET) is set to 6" to 12".  
 PUMP ON (A-SET) is set to 12" to 24".  
 HIGH LEVEL ALARM ON (B-SET) is set to 30" or greater  
 HIGH LEVEL ALARM OFF (B-RESET) is set 2" below the B-SET point.  
 (For deep sumps add 6" or more to each setting)

To check setting-Turn Knob to point and current setting will be displayed.  
 To change setting-Turn Knob to point and adjust screw until the desired new setting is displayed..



For programming and operating assistance PLEASE give us a call @ 770-889-7114.

**GunnCo Devar 332 Indicating Controller**

# Series 700 Submersible Pressure Transducer

The Series 700 pressure transducer uses piezoresistive pressure cell sensing technology with a 316 stainless steel diaphragm. The housing is 316 stainless steel with Teflon wetted materials. Cable is a heavy duty polyurethane jacketed and shielded with polyethylene breather tube. Conductors are 22 AWG.

Signal is 4-20mA provided by a 24 volt powered control loop.

Standard pressure range for leachate cell pump applications is 0-5 psi with 0-10 psi available. Higher ranges are available for storage tank applications.

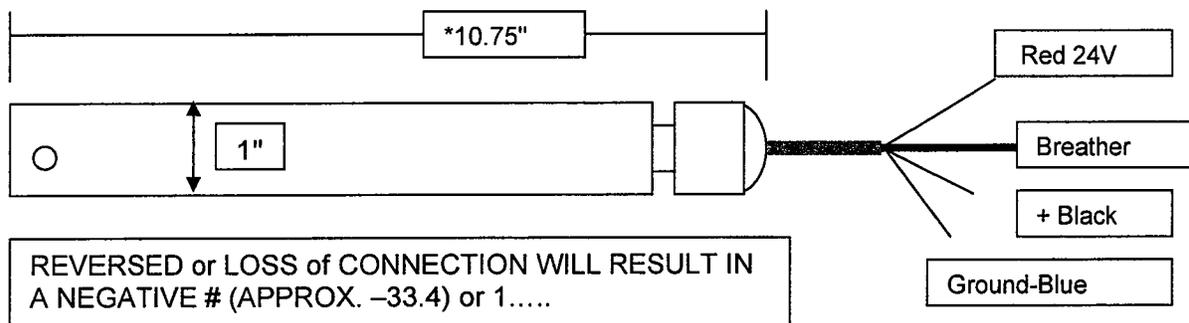
Accuracy is +/- 1.00 % of full range (for 0-5 psi accuracy is +/-1.4" minimum).

Rated burst pressure is 2X pressure range (10 psi minimum).

The standard Sidesloper unit is provided with an internal surge suppressor with more than 10,000 amperes peak surge. Protectors are multi-stage design, with a solid state section that intercepts the leading edge of the surge in a nanosecond. The second stage of the design contains a gas discharge tube which crowbars up to 20,000 ampere currents to ground. The tube remains in the crowbar start until the surge has passed, then rests to normal operation automatically.

Approvals are available for FM, CSA, and UL for Class 1, Div 1, Groups A, B, & C, and Class II, Div 1, group E, F, & G, and Class III, Div 1 hazardous locations. Hazardous location approvals are accomplished using approved electrical barrier.

A permanent bellows breather device mounted in the control panel allows the device to "breathe" and prevents moisture from entering and condensing in the vent tube of the cable. This device replaces desiccant tubes which require periodic replacement.



# **GunnCo *Sidesloper*<sup>TM</sup>**

## **Pumps and Systems Warranty Policy**

1. All ***Sidesloper*<sup>TM</sup>** GunnCo packages sold as specified and complete systems (pump, panel, and level sensor) shall be covered by a 12-month warranty. The warranty period begins upon the date of shipment and covers all components against failure to function due to workmanship, component failure, or materials compatibility for the application as recommended and sold and paid for within quoted terms.
2. All ***Sidesloper*<sup>TM</sup>** pumps or components not sold as a complete system are subject to a warranty period of one year from shipment date or per the manufacturers standard warranty, whichever expires first.
3. Claims under the warranty can be made by obtaining a return authorization number from GunnCo during the warranty period and returning the defective component(s), freight pre-paid to GunnCo or the proper service location as directed by GunnCo. Details of the problem should be included with the returned item along with the return authorization number. The defective component must be returned within 30 days of the authorization date. The option to repair, replace, or adjust the problem component shall be that of GunnCo. Costs associated with troubleshooting, removal or replacement of components, rental equipment, rush premium charges, and freight is not included under warranty.
4. Warranty does not cover normal wear, damage due to accident or physical damage (during shipment, installation, storage), acts of nature (lightning) (blown fuses and voltage monitors), misuse, abuse, improper storage, improper/defective electrical service (low/high voltage/surges), improper installation, improper selection, or improper or unauthorized service or modifications.
5. Warranty applies only to system as operating under the conditions at time of installation (clean leachate). Build up of abrasives in sump riser such as sludge, sand, silt or scale in pump/motor/carrier/transducer will void warranty.
6. GunnCo accepts no responsibility for damage, loss, or expenses incurred through the sale or use of its equipment. Under no condition shall GunnCo be held liable for any special, incidental, or consequential damage.

### **Service Labor, Repairs and Components/Parts Warranty Policy**

- 1) Service labor is warranted for quality of provided service. Repairs by GunnCo or GunnCo representative are warranted for 90 days from original installation/service dates. Failure due to work by others, modifications, non-approval for proper repairs, temporary repairs, materials by others, abuse, misuse, acts of nature, and non-recommended parts or components may not be covered by this warranty.
- 2) Parts and component are subject to original manufacturer's warranty periods and limits and may be subject to manufacturer's final inspection of a failed items.
- 3) GunnCo retains right to replace, repair, or refund labor and materials under the warranty where applicable.
- 4) Repair warranty for shop repairs is 90 days and does not include freight, removal, installation, non-GunnCo provided components or as noted for above service warranty.

\*\*\*\*\*

Please contact us immediately should you suspect there may be a problem or if you have any questions concerning the operation or installation of a system or component. By contacting us immediately we can assist in determining the problem and provide the fastest possible response.

# ***GunnCo Pump and Control, Inc.***

## ***Sidesloper™* PUMPING SYSTEM**

### **SAFETY**

The pumping system is designed to allow for an operator to check the system with a minimum of electrical knowledge. However when working around the pump and controller the following minimum safety precautions should be applied.

- When doing any service work within the interior of the control panel the main breaker should be in the off position.
- When visually inspecting interior control panel components do not touch any component unless power is switched off.
- Turn off power when replacing fuses.
- When working in the wet well or handling pump power should be off.
- A qualified electrician should install and connect the control panel.
- Control panel must be properly grounded with ground rod and conductor to back-plate.
- Pump ground wire should be connected to the ground lug provided.
- Do not work on control panel in wet conditions.
- All service work should be performed by qualified personnel.
- Any modifications to control panel should be approved by GunnCo prior to completion. Non-authorized modifications could void warranty and result in safety hazards.

### **SERVICE OR QUESTIONS**

**For authorized service of pump, controller, or components or returns and replacement of defective components call GunnCo Pump & Control, Inc.**

**Tel: 770-899-7114**  
**Fax: 770-889-2754**  
**e-mail: [gunnco@mindspring.com](mailto:gunnco@mindspring.com).**

# GunnCo Sidesloper Leachate Pumping Systems- 1/2000

## RISER AS BUILT DATA RECORD

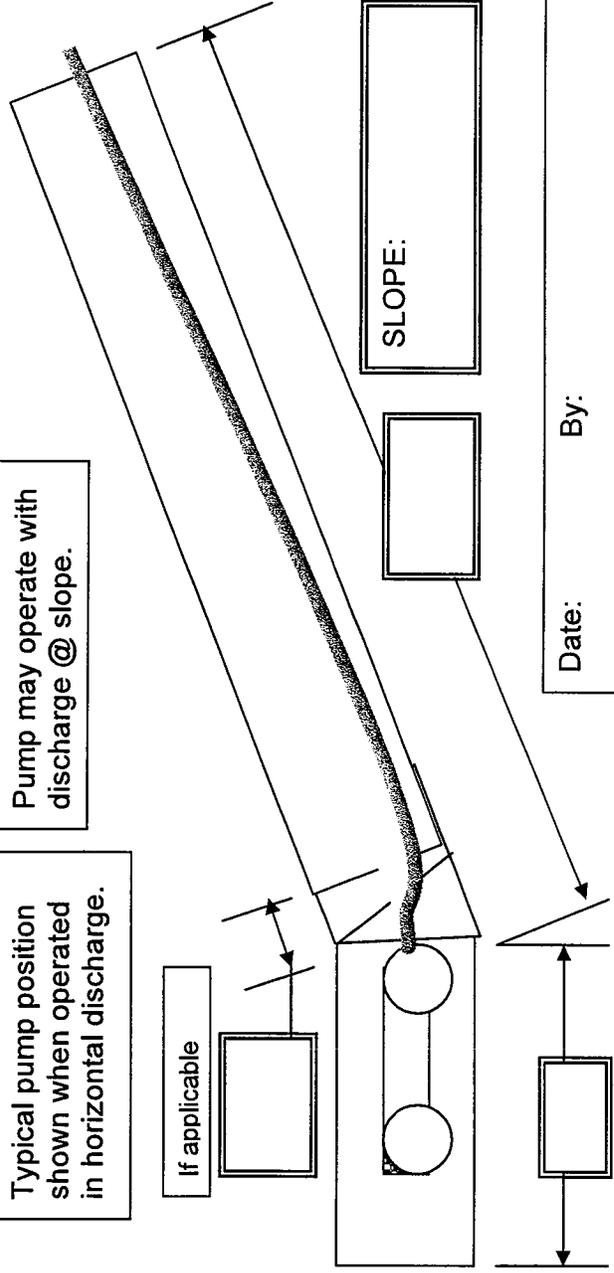
Please Complete Data

How is riser constructed at toe of slope? (design of turn / number of miters / distance of transition):

Typical pump position shown when operated in horizontal discharge.

If applicable

Pump may operate with discharge @ slope.



# GunnCo *Sidesloper* Leachate Pumping System Start-Up Check List

Date: \_\_\_\_\_ By: \_\_\_\_\_ Reference: \_\_\_\_\_

Voltage: L1-L2 \_\_\_\_\_ L1-G \_\_\_\_\_ L1-L2 \_\_\_\_\_ Pump Off 1/230 Volt

L1-L2 \_\_\_\_\_ L1-G \_\_\_\_\_ L1-L2 \_\_\_\_\_ Pump On

Amps: L1 \_\_\_\_\_ L2 \_\_\_\_\_ L1-L2 \_\_\_\_\_

Level Set Points: LEAD OFF: \_\_\_\_\_ LAG OFF: \_\_\_\_\_

High Level ON: \_\_\_\_\_ High Level OFF: \_\_\_\_\_

Please complete as possible and fax to GunnCo 770-889-2754

Level @ Start \_\_\_\_\_ TIME: \_\_\_\_\_

Level @ Completion: \_\_\_\_\_ TIME: \_\_\_\_\_

Installation:

Riser Length "As Built": \_\_\_\_\_ / \_\_\_\_\_

Exit Fittings: \_\_\_\_\_ Sensor Fittings: \_\_\_\_\_

**Is Panel Grounded with Ground Rod?** \_\_\_\_\_

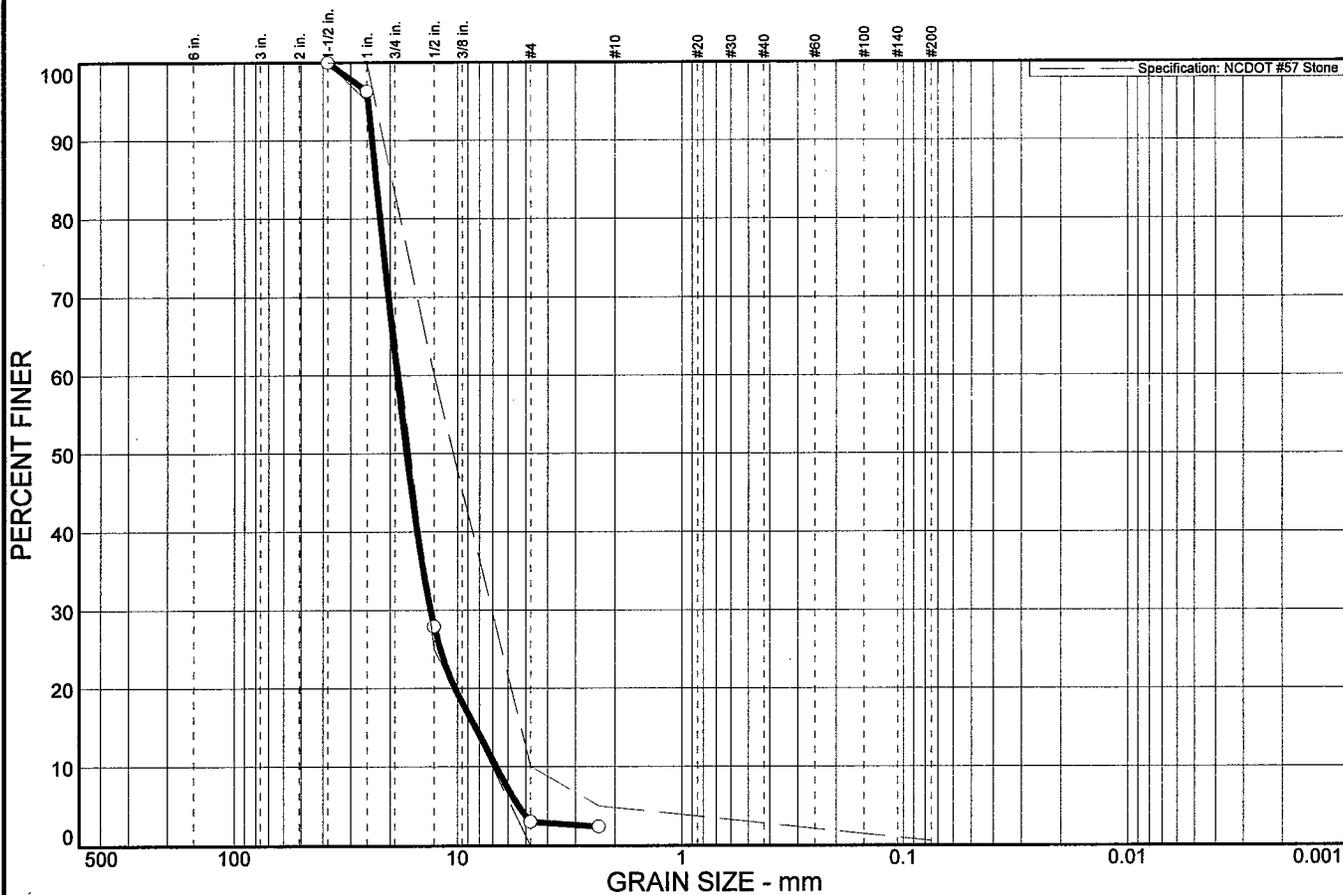
Are Conduits Sealed Riser to Panel (no gas flow)? \_\_\_\_\_

Panel Support: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

# Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	37.5	59.5				3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2 in.	100.0	100 - 100	
1 in.	96.3	95 - 100	
1/2 in.	27.9	25 - 60	
#4	3.0	0 - 10	
#8	2.4	0 - 5	

**Material Description**

Leachate (#57 Stone)  
*ok - HEVEN*

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>85</sub>= 23.1                      D<sub>60</sub>= 18.6                      D<sub>50</sub>= 16.9  
D<sub>30</sub>= 13.2                      D<sub>15</sub>= 8.36                      D<sub>10</sub>= 6.78  
C<sub>u</sub>= 2.75                      C<sub>c</sub>= 1.38

**Classification**

USCS=                      AASHTO=

**Remarks**

\* NCDOT #57 Stone

Sample No.: LC-3  
Location:

Source of Sample: Leachate

Date:  
Elev./Depth:

**Bunnell Lammons Engineering, Inc.**  
  
Greenville, SC

Client: HHNT  
Project: East Carolina Landfill  
Cell 12  
Project No: J07-1001-58

Plate

**APPENDIX I**

**REPORT OF GEOLOGIC OBSERVATIONS**



**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

# REPORT OF GEOLOGIC OBSERVATION: CELL No. 12 CONSTRUCTION

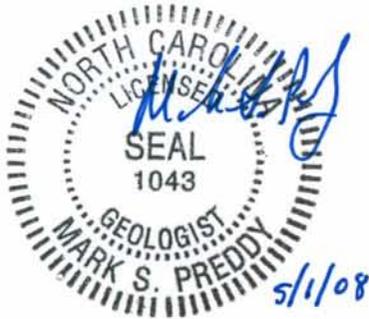
**EAST CAROLINA REGIONAL MSW LANDFILL  
BERTIE COUNTY, NORTH CAROLINA**

*Prepared for:*

**HODGES, HARBIN, NEWBERRY, & TRIBBLE, INC.  
484 Mulberry Street, Suite 265  
Macon, Georgia 31201**

*Prepared by:*

**BUNNELL-LAMMONS ENGINEERING, INC.  
6004 Ponders Court  
Greenville, South Carolina 29615**



May 1, 2008

BLE Project Number J07-1001-58



**BUNNELL-LAMMONS ENGINEERING, INC.**  
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

May 1, 2008

Republic Services of North Carolina, LLC  
c/o Hodges, Harbin, Newberry, & Tribble, Inc.  
484 Mulberry Street, Suite 265  
Macon, Georgia 31201

Attention: Mr. William F. Hodges, P.E.

Subject: **Report of Geologic Observation: Cell No. 12  
East Carolina Regional MSW Landfill  
Bertie County, North Carolina  
BLE Project Number J07-1001-58**

Gentlemen:

As authorized, Bunnell-Lammons Engineering, Inc. (BLE) performed field geologic observations during the Cell No. 12 subgrade preparation activities at the subject site. The purpose of this work was to observe and document the location of pertinent geologic features within the future Cell No. 12 footprint. The enclosed report describes the work performed and presents the results obtained.

We appreciate the opportunity to serve as your geological and geotechnical consultant on this project and look forward to working with you in the future. If you have any questions, please contact us at (864) 288-1265.

Sincerely,  
BUNNELL-LAMMONS ENGINEERING, INC.

Mark S. Preddy, P.G.  
Senior Geologist  
Registered, North Carolina #1043



Daniel B. Bunnell, P.E.  
Principal Geotechnical Engineer  
Registered, North Carolina #13814



c:\msp files\east carolina lf nc\100158\1001-58 geo ob cell 12.doc

## PROJECT INFORMATION

The East Carolina Regional Municipal Solid Waste (MSW) Landfill is located at 1922 Republican Road in Bertie County, 7.5 miles northwest of Windsor, North Carolina near the community of Aulander (Figure 1). The site consists of about 641 acres, which was formerly rural farmland and pine forest. The landfill is owned and operated by Republic Services of North Carolina, LLC (Republic).

The landfill is being developed in phases, as new solid waste cells are needed. Phases 1, 2, and 3 at the landfill consist of Cells No. 3 through 10. Phase 4 will consist of two solid waste cells (Cells No. 11 and 12). Cell No. 11 was previously constructed. Currently, Cell No. 12 is under construction.

BLE personnel are familiar with the site and previously performed several geologic/hydrogeologic investigations at the site, including the Site Hydrogeologic Report (SHR)<sup>1</sup>, and the Design Hydrogeologic Report (DHR)<sup>2</sup> for Phase 4. BLE has also performed the CQA monitoring, testing, and CQA reporting for Cell Nos. 3 through the current cell construction. This report documents the geologic observations during the preparation of the natural or in-situ soil subgrade prior to fill soil placement in Cell No. 12.

## SITE GEOLOGY

The site is located within the Coastal Plain region in northeastern North Carolina. The Coastal Plain consists of sediments that range in age from recent to Cretaceous or older and which lie on top of "basement" or crystalline rocks that are similar or equivalent to the igneous and metamorphic rocks of the Piedmont region. The Coastal Plain sediments range in thickness from a featheredge along the western edge to several thousand feet along the coast.

---

<sup>1</sup>*Report of Geologic and Hydrogeologic Assessment*, dated December 1, 1992, Law Engineering Job Number 2490472602.

<sup>2</sup>*Design Hydrogeologic Report, Phase 4 (Cells 11 and 12)*, dated January 7, 2005 (revised June 3, 2005), BLE Project Number J04-1001-46.

In the typical Coastal Plain stratigraphic sequence, Cretaceous sediments directly overlie the basement rocks and consist of the Black Creek and Cape Fear geologic formations. Tertiary sediments, which overlie the Cretaceous formations, consist of the Yorktown and Duplin geologic formations. Near-surface geologic units at the site include the Yorktown formation, which lies unconformably on top of the Black Creek formation.

Within the zone of investigation at the site (less than 65 feet below ground surface), the subsurface geology consists of four distinct soil layers, which are part of the Tertiary Yorktown Formation (Layers I and II) and Cretaceous Black Creek Formation (Layers III and IV). Layer I is a silty clay aquitard at the ground surface which has low permeability and serves as a confining layer for the underlying Layer II sandy aquifer. Layer II is the uppermost ground-water aquifer and consists of silty sand with potentiometric levels above the base of Layer I during most of the year. Layer III is a silty clay aquitard which serves as an intervening confining unit between the uppermost aquifer (Layer II) and an underlying confined aquifer (Layer IV). Layer IV is a confined aquifer consisting of silty sand, with potentiometric levels above the base of Layer III. Layers II and IV are fully separated by Layer III across the Phase 4 area.

### **FIELD OBSERVATIONS**

Engineers and geologists from BLE visited the site on multiple occasions during subgrade preparation. Additionally, BLE had a construction quality assurance (CQA) technician on site on a full-time basis during subgrade preparation, as well as during other cell construction activities. During these visits, the exposed ground surface was observed in order to identify anomalous geologic features not identified during previous geologic investigations. The visits were conducted during the site clearing and grading activities, and at the start of fill soil placement on top of in-situ soils. Geologic site observations are described below and are shown on photographs 1 through 6 in the Appendix.

The "A horizon" soils were removed from the Cell No. 12 ground surface during October and November 2007 along with the initial grading activities for Cell No. 12 (Appendix, Photo 1). Sediment removal along the east-west trending surface water drainage ditch that crossed the

central portion of the cell was also performed in November 2007 (Figure 2; Appendix, Photos 2 and 3). The removal of the runoff sediment was performed with minimal disturbance to Layer I using a bulldozer and a trackhoe excavator.

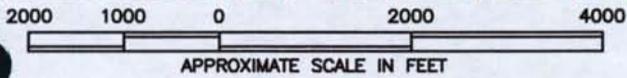
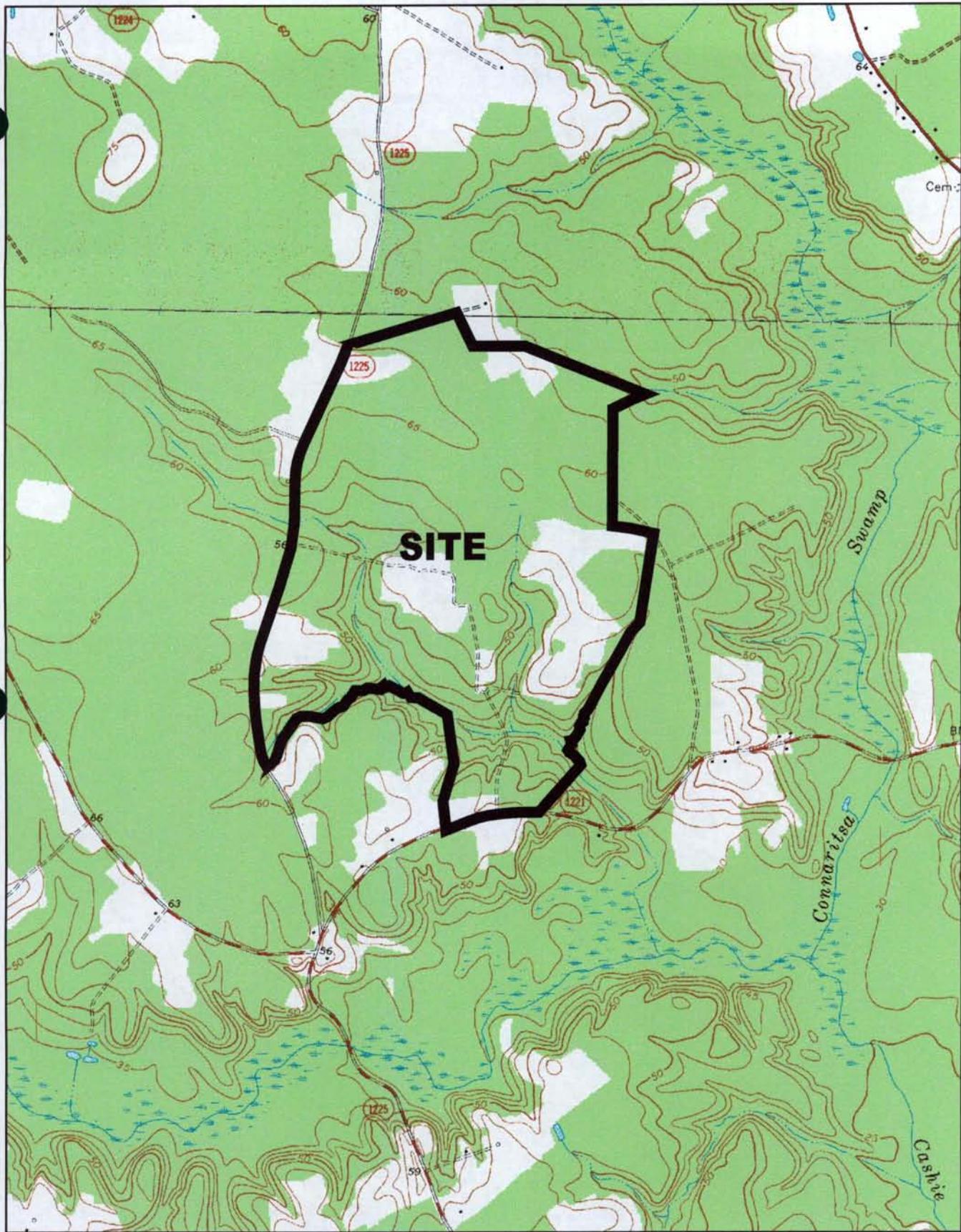
In accordance with the Phase 4 DHR, the surface water drainage ditch was backfilled with compacted clay liner quality soil with a permeability ( $K$ )  $\leq 1.0 \times 10^{-7}$  cm/sec during November 2007 (Appendix, Photos 4 and 5). Confirmation CQA in-place density testing and undisturbed soil samples were collected at the site and tested in the laboratory during the placement of the fill soils. The results of the confirmation samples are included with BLE's CQA report for Cell 12 and demonstrate that the drainage ditch backfill soils achieved the specified density and permeability.

Fill placement onto the completed subgrade also began in November 2007 (Appendix, Photo 6).

### CONCLUSIONS

The Layer I clay aquitard extends across the subgrade of Cell No. 12. Previous excavations into Layer I across the cell included an east-west trending surface water drainage ditch. As required by the Phase 4 DHR, the ditch was backfilled with compacted clay liner quality borrow soils that have a permeability ( $K$ )  $\leq 1.0 \times 10^{-7}$  cm/sec. CQA soil sample collection and testing confirmed that the backfill material was of the specified permeability. Also, the subgrade of Cell No. 12 was constructed by placing compacted structural fill soils above the existing Layer I soils. Therefore, Layer I will continue to serve as a confining layer for the Layer II aquifer. We conclude that modification of the existing *Water Quality Monitoring Plan* is not necessary.

**FIGURES**



REFERENCE:  
 USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES,  
 AULANDER AND REPUBLICAN, N.C. QUADRANGLES, 1972 AND 1978.

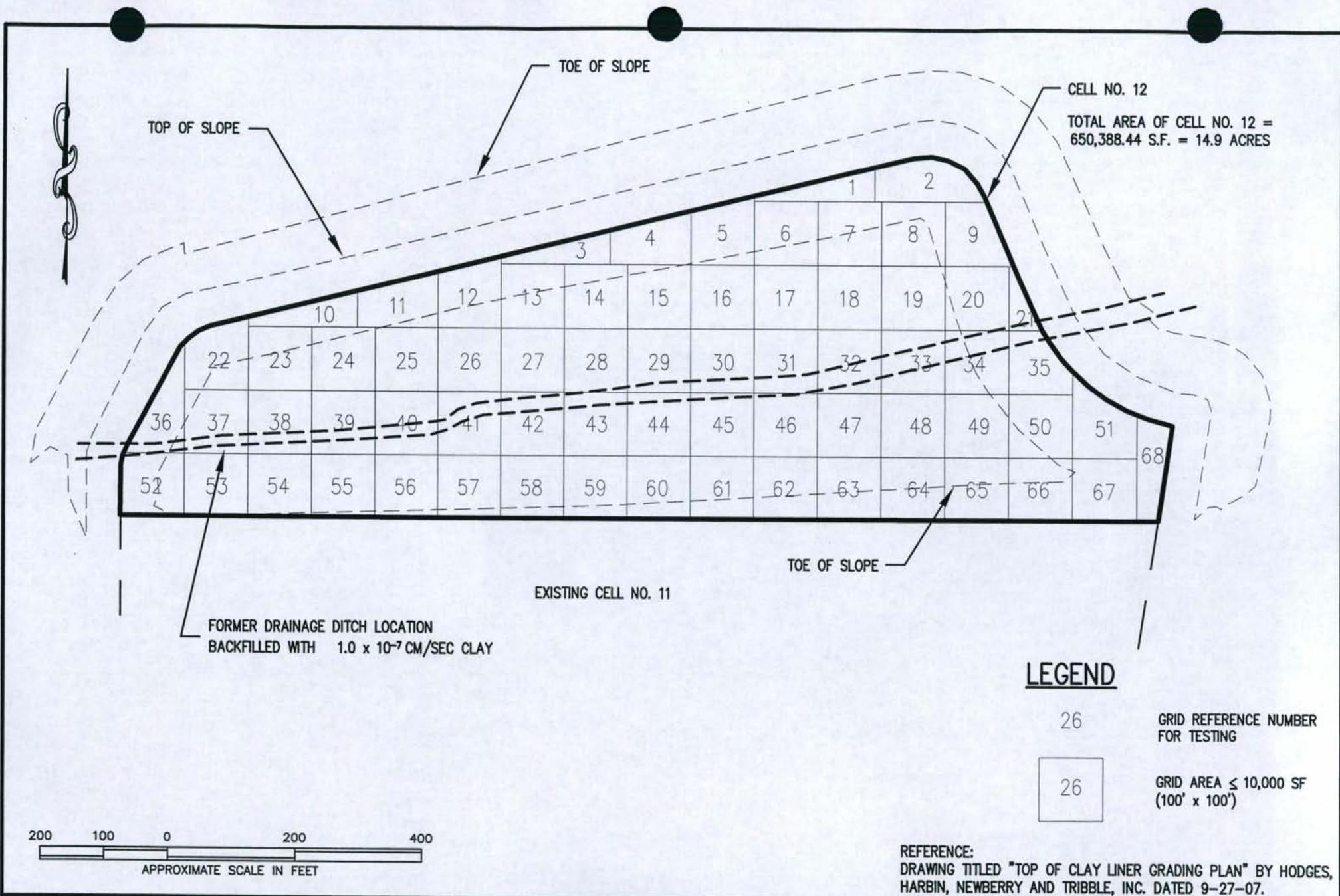
DRAWN:	AEH	DATE:	04-29-08
CHECKED:	MSP	CAD:	ECLF57-SLM
APPROVED:		JOB NO:	J07-1001-58

**IBLE**  
 BUNNELL-LAMMONS ENGINEERING, INC.  
 6004 PONDERS COURT  
 GREENVILLE, SOUTH CAROLINA 29615  
 PHONE: (864)288-1285 FAX: (864)288-4430

SITE LOCATION MAP  
 EAST CAROLINA LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE

1



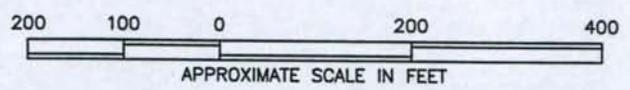
CELL NO. 12  
 TOTAL AREA OF CELL NO. 12 =  
 650,388.44 S.F. = 14.9 ACRES

EXISTING CELL NO. 11

FORMER DRAINAGE DITCH LOCATION  
 BACKFILLED WITH  $1.0 \times 10^{-7}$  CM/SEC CLAY

**LEGEND**

- 26 GRID REFERENCE NUMBER FOR TESTING
- 26 GRID AREA  $\leq 10,000$  SF (100' x 100')



REFERENCE:  
 DRAWING TITLED "TOP OF CLAY LINER GRADING PLAN" BY HODGES, HARBIN, NEWBERRY AND TRIBBLE, INC. DATED 9-27-07.

DRAWN: AEH	DATE: 04-29-08
CHECKED: MSP	CAD: ECLF58-GEO OB CELL 12
APPROVED:	JOB NO: J07-1001-58

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**CELL NO. 12 LAYOUT**  
 EAST CAROLINA REGIONAL MSW LANDFILL  
 BERTIE COUNTY, NORTH CAROLINA

FIGURE  
**2**

**APPENDIX**  
**Photographs**



Photograph 1: (November 2007) Cell No. 12 subgrade after clearing the topsoil and before the placement of compacted fill. Facing west.



Photograph 2: (November 2007) Removal of loose sediments and organic matter from the drainage ditch. Photograph taken facing northwest.



Photograph 3: (November 2007) Removal of loose sediments from the drainage ditch. Photograph taken facing east.



Photograph 4: (November 2007) Filling and compacting of clay soils along the former drainage ditch location. Photograph taken facing west.



Photograph 5: (November 2007) Filling and compacting of clay soils along the former drainage ditch location. Photograph taken facing east.



Photograph 6: (November 2007) Initial fill soil placement on top of the natural subgrade soil.