As-Built Documentation and Certification Report

White Street Construction and Demolition Landfill

Phase II Part 2 Closure

Permit No. 41-03 CDLF

Greensboro, North Carolina

March 2015

HDR Engineering Inc. of the Carolinas
3733 National Drive, Suite 207, Raleigh NC 27612
NC License F0116

APPROVED

DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION

Date 09/02/2015 **By** Patricia A. Backus

DIN 23936

CLOSURE CERTIFICATION

Permit 4103-CDLF-1998

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Table of Contents

Table of Contents i
Abstract I
Certification III
1 Introduction 1
1.1 Background 1
1.2 Project Description 1
2 Construction Quality Programs 3
2.1 Purpose and Scope 3
2.1.1 Construction Quality Control Program 3
2.1.2 Construction Quality Assurance Program 3
2.2 Project Criteria 4
2.3 CQA/CQC Personnel 4
3 Earthwork Construction 7
3.1 General 7
3.2 Borrow Source Characterization Study 7
3.3 Test Strip Construction 8
3.4 Inspection and In-Place Testing of Constructed Product 9
3.4.1 Low Permeability Soil Cap 9
3.4.2 Topsoil Layer 10
4 Drainage System Installation 13
4.1 General 13
4.2 Upper Cap Termination 13
4.3 Lower Cap Termination 13
4.4 Slope Drain Construction 13
5 Photographic Documentation 15

Appendices

Appendix A – CQC Testing (ECS Carolinas, LLP)

A1 Field Reports

A2 Borrow Source Characterization Study (On-Site Soil)

A3 Borrow Source Characterization Study (Off-Site Soil)

A4 Hydraulic Conductivity

A5 Atterberg Limits and Fines Content

A6 Moisture-Density Testing

Appendix B – CQA Testing (HDR / Geotechnics)

B1 Field Reports

B2 Atterberg Limits and Fines Contents

B3 Sieve Analyses

B4 Hydraulic Conductivity

Appendix C – Surveys

Plan Sheet No. S-1 – Initial, Clap Cap and Topsoil; Sections 1, 2, 3, 4, and 6

Plan Sheet No. S-2 – Initial, Clay Cap and Topspoil; Sections 5, 7, 9, and 8

Plan Sheet No. S-3 – Initial, Clay Cap and Topsoil; Sections 10, 12, 11, 13, and 14

Plan Sheet No. S-4 – Initial, Clay Cap and Topsoil; Sections 15, 17, and 16

Plan Sheet No. T-1 – Clay Topographic Survey; Sections 1 - 17

Plan Sheet No. T-2 – Topsoil Topographic Plan; Sections 1 - 17

Abstract

This certification report provides documentation for the construction of the approximately 26-acre Phase II Part 2 closure of the White Street Construction and Demolition (C&D) Landfill located in Greensboro, North Carolina.

The closure construction work was conducted between March 1, 2014 and October 10, 2014. HDR Engineering, Inc. of the Carolinas (HDR) provided part-time construction quality assurance (CQA) services to the City of Greensboro Field Operations Department (City) during closure construction. CQA services provided by HDR included the part-time observation of the following construction activities:

- low-permeability soil cap test pad construction;
- low-permeability soil cap construction;
- topsoil placement;
- installation of cap terminations, slope drain extensions, and diversion ditches; and
- permanent seeding.

HDR also provided limited CQA testing to independently verify that the soil materials used in the project met the specification requirements.

The conformance of the construction materials and installation methods with the requirements of the technical specifications prepared specifically for this project was documented for each component. The required testing was performed using the methods and frequencies outlined in the technical specifications. Materials, site conditions, or test results that indicated nonconformance were identified, reported, and remediated. The low-permeability soil cap was required to achieve both a maximum permeability of $1x10^{-5}$ cm/sec and a minimum thickness of 18 inches. The topsoil layer was required to achieve a minimum thickness of 6 inches. HDR reviewed construction and as-built survey information to verify conformance with the construction limits and tolerances specified.

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Certification

HDR Engineering, Inc. of the Carolinas (HDR) hereby provides Certification that:

- The construction specifications entitled *White Street Landfill Phase II Part 2 Partial Closure - Issued for Construction, Construction Documents Project Manual*, dated September 2013; the drawings entitled *Construction Plans for the White Street Landfill, Phase II Part 2 Closure, Issued for Construction*, dated September 2013; and the Construction Quality Assurance (CQA) Plan entitled, *White Street Landfill, Greensboro, North Carolina, Construction Quality Assurance Plan, Phase 2 Partial Closure*, dated November 2011 for the partial closure project were developed in general accordance with the following documents:
    - *City of Greensboro White Street Landfill, Construction & Demolition Landfill Permit Application,* dated June 2008, by the City of Greensboro and approved by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management, Solid Waste Section on March 30, 2012.
    - NCDENR Municipal Solid Waste Facility Permit No. 41-03-CDLF issued on March 30, 2012.
    - The requirements of the applicable North Carolina Solid Waste Management Regulations, Title 15A, Chapter 13B, Section .0547, *Existing C&DLF Units as of January 1, 2007*.
- To the best of our knowledge, the Phase II Part 2 closure of the White Street C&D Landfill was constructed in general accordance with the construction specifications and drawings.
- Our knowledge is based on HDR's observations during construction, along with the test results, reports, and as-built documentation presented in this report.
- The Phase II Part 2 closure of the White Street C&D Landfill was essentially completed around mid October 2014.

The services provided for this project were performed with the care and skill ordinarily exercised by reputable members of the profession practicing under similar conditions at the same time and the same or similar locality. No warranty, expressed or implied, is made or intended by rendition of these consulting services or by furnishing oral or written reports of the findings made. This certification report has been prepared for the exclusive use of the City of Greensboro, North Carolina.

Thomas M. Yanoschak, P.E.
Certifying Engineer
N.C. P.E. # 18887

3/4/15

HDR Engineering, Inc. of the Carolinas
N.C. Engineering Board No. F0116

1 Introduction

1.1 Background

The City owns approximately 980 acres at the eastern end of White Street, designated as the White Street Landfill. The area includes both active and inactive solid waste management facilities. The construction and demolition landfill (C&DLF) unit on top of the closed municipal solid waste landfill (MSWLF) that is the subject of this certification report is referenced as Phase II of the White Street Landfill. Phase II was originally permitted in the late 1970s as a 135-acre, unlined MSWLF. A transition plan to close the unlined MSWLF and develop the remaining capacity as a C&DLF over the closed MSWLF was approved in 1996 and revised in 1997. All of the MSWLF (approximately 70 acres) was permanently closed in 1997, with a capping system. The remaining 65 acres were permitted as a C&DLF over closed MSWLF in 1998.

The initial phase of closure of the C&DLF (designated as the Phase II, Part 1 closure) was constructed between October 2012 and April 2013 and consisted of approximately eight acres located near the southeast portion of the landfill. As-built certification documentation for the Part 1 closure was submitted to NCDENR on August 6, 2013 and the certification was approved by NCDENR on February 17, 2014.

The Phase II Part 2 closure area consists of approximately 26 acres, including tie-in areas, located on the north, east, and west sides of the active portion of the C&D landfill. This area was chosen for closure since final grades had been achieved and is represented by this certification report. Additional portions of the C&D landfill will be closed incrementally as more areas reach final grades.

The closed Phase I sanitary landfill and the active compost processing area are located directly southwest and south of Phase II, respectively. An inactive borrow area is located west of Phase II. Private land, comprised primarily of rural residences, borders the north and east sides of Phase II. A general contractor’s equipment yard also is located along a portion of the east side of Phase II.

1.2 Project Description

HDR was contracted by the City of Greensboro to perform part-time construction quality assurance (CQA) services during construction of the Phase II Part 2 closure which began in March 2014 and was completed in October 2014. The Phase II Part 2 closure was designed with a cap system which consists of the following components:

- 6-inch topsoil layer;
- 18-inch low-permeability soil cap (hydraulic conductivity < 1x10-5 cm/sec);
- cap terminations, slope drain extensions, and diversion ditches; and
- permanent vegetation

Construction of the Phase II Part 2 closure was completed in general accordance with the requirements of the construction specifications and drawings dated September 2013 and prepared by HDR. Supporting documentation such as field and laboratory testing reports, inspection forms and documentation, and as-built drawings is provided in the appendices of this report.

2 Construction Quality Programs

2.1 Purpose and Scope

The purpose of this certification report is to present the results of the construction quality control (CQC) and construction quality assurance (CQA) documentation related to observations and test data compiled during construction of the Part 2 closure of the Phase II C&D landfill. This report has been prepared as required by, and in accordance with, the Closure Plan as contained within the *City of Greensboro White Street Landfill, Construction & Demolition Landfill Permit Application,* dated June 2008 and approved by NCDENR in March 2012.

2.1.1 Construction Quality Control Program

Construction quality control (CQC) refers to those actions which provide a means to measure and regulate the characteristics of an item or service to the specified contractual and regulatory requirements, including those actions taken by manufacturers, fabricators, installers, or subcontractors (paid for by the contractor) to ensure that the materials and the workmanship meet the requirements of the technical specifications for the project.

Triangle Grading and Paving, Inc. (Triangle), of Burlington, North Carolina, was the general contractor for the Phase II Part 2 closure project. Triangle subcontracted the following firms to provide CQC services.

- ECS Carolinas, LLP, of Greensboro, North Carolina, provided CQC inspection and testing services required during construction for the earthwork during the Phase II Part 2 closure. Field and laboratory CQC test results associated with the earthwork portion of the landfill closure as well as field reports are presented in Appendix A.
- Borum, Wade and Associates, PA of Greensboro, North Carolina, provided CQC surveying services required for the earthwork for the Phase II Part 2 closure. Surveying data is provided in Appendix C.

2.1.2 Construction Quality Assurance Program

Construction quality assurance (CQA) is a planned and systematic pattern of all means and actions designed to provide confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.

CQA refers to means and actions employed by the Owner to assure the conformity of the earthwork, cap system, and drainage structures with the technical specifications and drawings issued for the project. CQA is provided by a party independent from the manufacturer, fabricator, contractor, and installer. HDR provided part-time CQA monitoring services during construction of the Phase II Part 2 closure. These services included the following.

- Overall coordination between all parties including City representatives, the contractor, the CQC soils consultant/laboratory, and the CQA soils laboratory.
- Periodic inspection during periods of major work.
- Verification testing in the form of laboratory hydraulic conductivity and classification testing of the low-permeability soil cap.

Geotechnics of Raleigh, North Carolina, provided CQA laboratory services under the direction of HDR and is also referred to as CQA personnel.

Laboratory CQA test results associated with the earthwork portion of the landfill closure as well as field reports are presented in Appendix B.

2.2 Project Criteria

The Phase II Part 2 closure construction was performed under the guidance of the following documents.

The construction specifications entitled White Street Landfill Phase II Part 2 Closure - Issued for Construction, Construction Documents Project Manual, dated September 2013 and drawings entitled Construction Plans for the White Street Landfill, Phase II Part 2 Closure, Issued for Construction, dated September 2013.

The Construction Quality Assurance (CQA) Plan entitled, White Street Landfill, Greensboro, North Carolina, Construction Quality Assurance Plan, Phase 2 Partial Closure, dated November 2011.

The City of Greensboro White Street Landfill, Construction & Demolition Landfill Permit Application, dated June 2008, by the City of Greensboro and approved by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management, Solid Waste Section on March 30, 2012.

NCDENR Municipal Solid Waste Facility Permit No. 41-03-CDLF issued on March 30, 2012.

The requirements of the applicable North Carolina Solid Waste Management Regulations, Title 15A, Chapter 13B, Section .0547, Existing C&DLF Units as of January 1, 2007.

The quality of the overall project was governed by adherence to the construction specifications and drawings. The quality of the low-permeability soil cap and topsoil layer was governed by adherence to the construction specifications. All construction and CQA/CQC activities were conducted in accordance with the construction specifications and drawings. Documentation of the construction activities and the results of quality assurance and quality control testing are contained in the following sections and appendices of this report.

2.3 CQA/CQC Personnel

HDR provided part-time CQA services during construction of the Phase II Part 2 closure, as described in this report. Key HDR personnel for this project are listed below.

- Michael D. Plummer, P.E., Design Engineer and Project Manager
- Thomas M. Yanoschak, P.E., Field Inspection and Certifying Engineer

Key representatives of the other parties involved are as follows.

Owner: City of Greensboro

- Gail G. Hay, P.E., Technical and Planning Support Manager
- Jason Jernigan, Solid Waste Disposal Manager

Contractor/Construction Quality Control:

- Triangle Grading and Paving, Inc. (General Contractor)
    - Travis Sharpe, Project Manager
    - Roger Jackson, Superintendent

- ECS Carolinas, LLP (CQC Field Inspection and Testing Services)
    - Sun Breza, P.E., Construction Services Manager

- Borum, Wade and Associates, PA (CQC Surveying Services)
    - Homer S. Wade, PLS, Surveyor

Construction Quality Assurance:

- Geotechnics (CQA Testing Services)
    - Michael P. Smith, Regional Manager

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3 Earthwork Construction

3.1 General

This section provides information regarding CQC/CQA activities for the earthwork associated with the construction of the Phase II Part 2 closure including observations and monitoring of all soil components. Preconstruction, field, and laboratory testing are also addressed. Field reports and earthwork test results are contained in Appendix A (CQC) and Appendix B (CQA). As-built drawings of the closure area and thickness verification tables are contained in Appendix C.

3.2 Borrow Source Characterization Study

The material used for the construction of the low permeability soil cap was obtained from both the on-site landfill borrow area and an off-site borrow source. In accordance with the Specifications, Triangle performed a Borrow Source Characterization Study (BSCS) within both borrow areas to confirm that the material proposed for use as the low permeability soil cap would meet the specification requirements.

Material from the on-site landfill borrow area was used to construct the low permeability soil cap within Areas 1, 3, 2, 4, and 6 as delineated in the certification drawings in Appendix C. Since the same on-site borrow area was used as the source of the low permeability soil cap during the Part 1 closure construction, the Part 1 closure BSCS was also considered applicable for the Part 2 closure provided Triangle perform periodic confirmatory laboratory testing and visual checks to ensure the excavated material was consistent with the material encountered during the BSCS. A total of 12 bulk soil samples were obtained from test pits excavated within the borrow area. Triangle delivered the samples to the ECS soils laboratory for Atterberg limits determinations (ASTM D 4318), percent fines determinations (ASTM D 1140), standard Proctor compaction test (ASTM D 698), and hydraulic conductivity tests (ASTM D 5084). A summary of the test results is provided in Appendix A. The results show that the borrow materials tested were suitable for use in construction of the low permeability soil cap with hydraulic conductivities ranging from 7.2×10^{-8} cm/sec to 2.2×10^{-6} cm/sec. These all met the maximum hydraulic conductivity requirement of 1×10^{-5} cm/sec as contained in the Specifications.

Material from the off-site borrow source was used to construct the low permeability soil cap within Areas 5, and 7 through 17 as delineated in the certification drawings in Appendix C. A total of 12 bulk soil samples were obtained from test pits excavated within the borrow area. Triangle delivered the samples to the ECS soils laboratory for Atterberg limits determinations (ASTM D 4318), percent fines determinations (ASTM D 1140), standard Proctor compaction test (ASTM D 698), and hydraulic conductivity tests (ASTM D 5084). A summary of the test results is provided in Appendix A. The results show that the borrow materials tested were suitable for use in construction of the low permeability soil cap except at test pit locations 2 and 12, where the tested hydraulic conductivities exceeded the maximum hydraulic conductivity requirement of 1×10^{-5} cm/sec as contained in the Specifications. The tested hydraulic conductivities at the remaining locations ranged from 4.5×10^{-8} cm/sec to 8.0×10^{-6} cm/sec. Based on these results, HDR informed Triangle to avoid obtaining low permeability soil cap material from the vicinity of test pits 2 and 12.

3.3 Test Strip Construction

The suitability of both the on-site and off-site low permeability soil cap sources was confirmed during test strip construction at the landfill.

The test strip for the on-site low permeability soil cap source was constructed within Area 1 of the Phase II Part 2 closure area above the access road to the active C&DLF (see surveys in Appendix C) between March 27 and April 2, 2014. The test strip for the off-site low permeability soil cap source was constructed within the high end of Area 5 of the Phase II Part 2 closure area (see surveys in Appendix C) on May 29, 2014. Each test strip was a minimum of 100 feet long and 30 feet wide and was constructed with three 6-inch lifts placed over a compacted subgrade using the same equipment and methods proposed for full-scale cap construction in accordance with the project Specifications.

The specifications required the subgrade within the test strip area to be compacted to a minimum of 95 percent of the maximum dry density as determined using the Standard Proctor test (ASTM D 698) at a minimum of three locations. ECS testing indicated the subgrade was adequately compacted prior to the placement of the low permeability soil cap material.

At least five field density measurements were required for each lift within the test strip to verify that adequate compaction was obtained. Triangle established a minimum compaction criterion of 95% of the maximum dry density as determined by the standard Proctor compaction test (ASTM D 698). Proctor curves obtained for the borrow soils during the BSCS were used to determine the maximum dry density target. Field density tests were performed by ECS to verify that adequate compaction was obtained. Any areas that did not meet the minimum 95% compaction criterion were additionally compacted or reworked and then compacted until satisfactory results were obtained. The density test results are provided within the CQC field reports contained in Appendix A.

The project specifications also required the contractor to obtain random samples of low permeability soil cap material during test strip installation for classification testing (i.e., Atterberg Limits, fines content, and moisture content). These CQC tests were performed for the off-site source test pad but were not performed for the on-site source test pad. These results are provided within the CQC Test Summary in Appendix A and show all samples classified as a lean sandy clay (CL) in accordance with ASTM D 2487 for the off-site low permeability soil. The CQA testing for the on-site low permeability soil (Appendix B) indicate the material is classified as an elastic silt (MH) in accordance with ASTM D 2487.

One undisturbed drive tube sample was obtained for each lift of low permeability soil cap by ECS for hydraulic conductivity testing at the off-site low permeability soil test strip. Although the CQC drive tube samples were also collected for the on-site low permeability soil test strip, the hydraulic conductivity tests were apparently never performed. The results for the off-site low permeability soil test strip are provided within the CQC Hydraulic Conductivity Tests in Appendix A and show each lift met the maximum $1x10^{-5}$ cm/sec permeability requirement. The CQA drive tube samples obtained at the on-site low permeability soil test strip and provided in Appendix B show that each lift met the maximum $1x10^{-5}$ cm/sec permeability requirement.

HDR provided a geotechnical engineer during test strip installation to ensure the test strip construction and sample collection was being performed in accordance with the project specifications. The engineer also collected soil samples for confirmatory CQA laboratory testing. The results, including hydraulic conductivity tests, are provided in Appendix B and show that the results agree reasonably with the CQC test strip results where available.

Based on CQA field observations, CQC field density testing, and CQA and CQC laboratory soils testing, the test pads were performed in general conformance with the specification requirements, except as noted above, and indicated that the proposed low permeability soil cap materials and proposed construction methods were suitable. Although the CQC testing for the on-site low permeability soil was not complete, the corresponding CQA testing of the test pad and additional CQC and CQA testing during construction indicated the material met the project requirements.

3.4 Inspection and In-Place Testing of Constructed Product

3.4.1 Low Permeability Soil Cap

Subgrade preparation consisted of the stripping of vegetation and unsuitable soils from areas to receive low permeability soil cap, compacting with a sheep's foot roller, and then proofrolling the exposed surface with a loaded rubber-tired vehicle. Any areas exhibiting excessive pumping or rutting were over-excavated and filled with compacted soil. Any waste exposed during this process was removed and disposed at the working face of the C&D landfill. ECS personnel were on-site to observe all proofrolling.

Field density tests were performed using the drive tube method (ASTM D 2937) by CQC personnel to verify that the compacted low permeability soil material met project specifications. The testing frequency far exceeded the minimum requirement of one test per every 2 acres as established within the specifications. The density test results are provided within the CQC field reports contained in Appendix A. Any areas that did not meet the minimum 95% compaction criterion were additionally compacted or reworked and then compacted until satisfactory results were obtained.

During placement and compaction of the low permeability soil layer, CQC personnel also obtained six drive tube samples of the compacted clay lifts for laboratory hydraulic conductivity testing (ASTM D5084) in order to meet the specified testing frequency of one test per every 5 acres. Twelve bulk samples were also obtained for classification testing during cap construction. The results of these tests are provided in Appendix A and show that the soil cap materials and construction methods were satisfactory.

The quality of the low permeability soil cap was visually monitored by CQA personnel on a periodic basis during placement. CQA personnel conducted supplemental sampling and laboratory testing in order to confirm CQC testing results. These results, including three additional hydraulic conductivity tests, five Atterberg limits determinations, and five sieve analyses confirmed the CQC test results and are provided in Appendix B.

Approximately 63,300 cy of low permeability soil cap material with a maximum hydraulic conductivity of $1x10^{-5}$ cm/sec was required to complete the approximately 26-acre Phase II Part 2 closure. The layer is a minimum of 18 inches thick. Compaction was accomplished using a tamping foot compactor. Compaction quality was monitored by visual and quantitative means. CQA personnel periodically observed the placement, compaction, and field testing activities for the low permeability soil layer. All placed materials were visually monitored to ensure no debris existed in the layer (i.e., roots, stones, etc.); there were no void areas; the layer was firm and uniform after compaction; and no deleterious material existed on the surface. Holes created in the low permeability layer as a result of drive tubes were backfilled by tamping low permeability material into the holes in 2-inch lifts.

In addition to construction material conformance testing, CQC personnel performed thickness verification of the low permeability soil cap by comparing survey shots taken before and after low permeability cap placement. The project specifications required a minimum of eight thickness verifications per acre for a total of 210 verifications. As shown in Plan Sheets Nos. S-1 through S-4 in Appendix C, over 600 verifications were performed. Borum, Wade and Associates, PA provided the CQC survey of construction activities with horizontal and vertical control of the low permeability soil cap placement. All points indicated the minimum 18-inch thickness was achieved except at tie-in locations near the access road, in conformance with the proposed construction drawings. A topographic survey of the top of the low permeability soil cap is provided in Plan Sheet No. T-1 in Appendix C.

For acceptance, the constructed low permeability soil cap is required to be at least 18 inches thick and demonstrate a maximum permeability of 1×10^{-5} cm/sec upon laboratory testing. Based on testing and survey data, these two requirements were achieved.

3.4.2 Topsoil Layer

As areas of the soil cap layer were completed and determined to meet the acceptance criteria, the topsoil layer was installed. Approximately 21,100 cy of topsoil was required to cover the low permeability cap with the required 6-inch layer. No testing was required for the topsoil; however, the material used was required to be able to support vegetative growth. The topsoil for this project was either stripped from the borrow area at locations where the low permeability soil cap material was obtained or was manufactured within the on-site borrow area my mixing on-site soil with composted leaves during the soil screening process. In addition, satisfactory material without debris or waste which was stripped from the closure area during subgrade preparation was reused as topsoil.

The quality of the topsoil layer material was visually monitored by CQA personnel on a periodic basis. CQC and CQA personnel also visually monitored for debris (i.e., roots) within the topsoil layer material. Debris was removed by the contractor during placement of the material.

CQC personnel performed thickness verification of the topsoil layer cap by comparing survey shots taken before and after topsoil placement. As shown in Plan Sheets Nos. S-1 through S-4 in Appendix C, over 600 verifications were performed. Borum, Wade and Associates, PA provided the CQC survey of construction activities with horizontal and vertical control of topsoil

placement. All points indicated the minimum 6-inch thickness was achieved. A topographic survey of the top of topsoil is provided in Plan Sheet No. T-2 in Appendix C.

The construction of the topsoil layer was also visually monitored by both the CQC and CQA representatives to assure that the underlying low permeability soil cap was not compromised. Based on the observations made by CQC and CQA, the topsoil layer component was constructed in accordance with the drawings and specifications using all means to prevent damage to the underlying layer during construction.

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4 Drainage System Installation

4.1 General

This section provides information regarding construction activities, observation and monitoring conducted during the drainage system installation associated with the construction of the Phase II Part 2 closure.

4.2 Upper Cap Termination

The upper edge of the Phase II Part 2 closure generally terminates along an access road that roughly delineates the limits of the active C&DLF. A future closure will extend the cap above the upper cap termination.

The upper cap termination was constructed of low permeability soil cover material sloped to provide the required lateral slope for drainage of the existing access road. After the termination was constructed, topsoil was placed over the low permeability soil cover, seeding occurred, and temporary erosion control matting was installed in accordance with the drawings. CQA and CQC personnel periodically observed upper cap termination construction to ensure it was constructed in accordance with the project plans and specifications. The location of the upper cap termination is shown on the as-built survey provided on Plan Sheet Nos. T-1 and T-2 located in Appendix C.

4.3 Lower Cap Termination

The lower edge of the Phase II Part 2 closure generally terminates along the limits of waste of the C&DLF. The location of the C&DLF limits of waste varies from near the toe of the Phase II slope on the east side of the landfill to approximately mid slope on the north and west sides where the cap ties into the previously constructed cap over the closed MSWLF.

The lower cap termination was constructed of low permeability soil cover material sloped to provide a gradual tie-in to existing grades that would not interfere with cap maintenance or drainage. The full 18-inch thickness of low permeability soil cover was constructed to the closure limits wherever possible. After the termination was constructed, topsoil was placed over the low permeability soil cover, seeding occurred, and temporary erosion control matting was installed in accordance with the drawings. CQA and CQC personnel periodically observed lower cap termination construction to ensure it was constructed in accordance with the project plans and specifications. The location of the lower cap termination is shown on the as-built survey provided on Plan Sheet Nos. T-1 and T-2 located in Appendix C.

4.4 Slope Drain Construction

Construction of the Phase II Part 2 closure required the construction of five slope drains designed to provide stormwater drainage from the active C&DLF.in order to avoid discharging stormwater onto the cap. One slope drain is located in Area 2, two are located in Area 5, one in Area 16 and one in Area 17. All slope drains were constructed of either 15-inch or 18-inch diameter dual wall corrugated plastic pipe (CPP) as indicated on the plans. Slope drains were constructed by excavating a trench within the existing soils to the extent possible without

uncovering waste, installing the pipe, backfilling the pipe trench with compacted low permeability soil, and constructing the full thickness of the low permeability soil cap and topsoil layers over the pipe. The full thickness of the soil cap over the pipe was achieved by mounding if adequate depth of existing soils was not available. Inlets and outlets consisted of molded high density polyethylene (HDPE) flared end sections. Inlet and outlet aprons were constructed of grouted NCDOT Class B riprap underlain by NCDOT Type 2 geotextile. Red marker posts were placed at each newly installed inlet and outlet.

The slope drains were installed in general accordance with the drawings and specifications. The as-built locations of the slope drains are provided on Plan Sheet Nos. T-1 and T-2 located in Appendix C.

5 Photographic Documentation

March 27, 2014 – Construction of first lift of test pad for on-site low permeability soil in Area 1.

March 27, 2014 – Stripping of vegetation and topsoil in Area 1 adjacent to completed Part 1 closure.

March 27, 2014 – Proofrolling subgrade in Area 3.

March 27, 2014 – On-site borrow area for low permeability soil.

March 27, 2014 – Areas 1 and 3 after being stripped of vegetation.

April 2, 2014 – Obtaining drive tube sample of low permeability soil for test pad in Area 1.

April 2, 2014 – Placing second lift of low permeability soil on test pad in Area 1.

April 15, 2014 – Placement of low permeability soil in Area 2.

April 15, 2014 – Low permeability soil in Areas 3 and 2.

April 29, 2014 – Low permeability soil in Area 2.

May 6, 2014 – Removal of unsuitable soil in Area 2.

May 6, 2014 – Placement of low permeability soil in Area 4.

May 6, 2014 – Placement of topsoil in Area 1.

May 6, 2014 – Topsoil in Area 3 (foreground) and placement of low permeability soil in Area 2 (background).

May 22, 2014 – Low permeability soil in Area 6.

May 22, 2014 – Placement of topsoil in Area 4.

May 22, 2014 – Low permeability soil at north edge of Area 6.

May 22, 2014 – Topsoil screening within on-site borrow area.

May 29, 2014 – Construction of first lift of test pad for off-site low permeability soil in Area 5.

May 29, 2014 – Obtaining drive tube sample of low permeability soil for test pad in Area 5.

May 29, 2014 – Placing topsoil in Areas 4 and 6.

June 5, 2014 – Erosion control matting installed in Areas 1, 3, 2, 4, and 6.

June 5, 2014 – Topsoil in Area 5.

June 19, 2014 – Low permeability soil in Area 8.

June 19, 2014 – Area 12 stripped of vegetation and topsoil.

June 19, 2014 – Low permeability soil in Area 8 (foreground) and topsoil in Area 9 (background).

July 8, 2014 – Vegetation in Areas 1 and 3.

July 8, 2014 – Vegetation in Areas 4 and 2.

July 8, 2014 – Topsoil in Areas 5 and 7.

July 8, 2014 – Low permeability soil in Area 10.

July 8, 2014 – Stripping of vegetation and topsoil in Areas 11 and 13.

July 8, 2014 – Obtaining drive tube sample of low permeability soil in Area 8.

July 29, 2014 – Areas 15, 17, and 16 stripped of vegetation and topsoil.

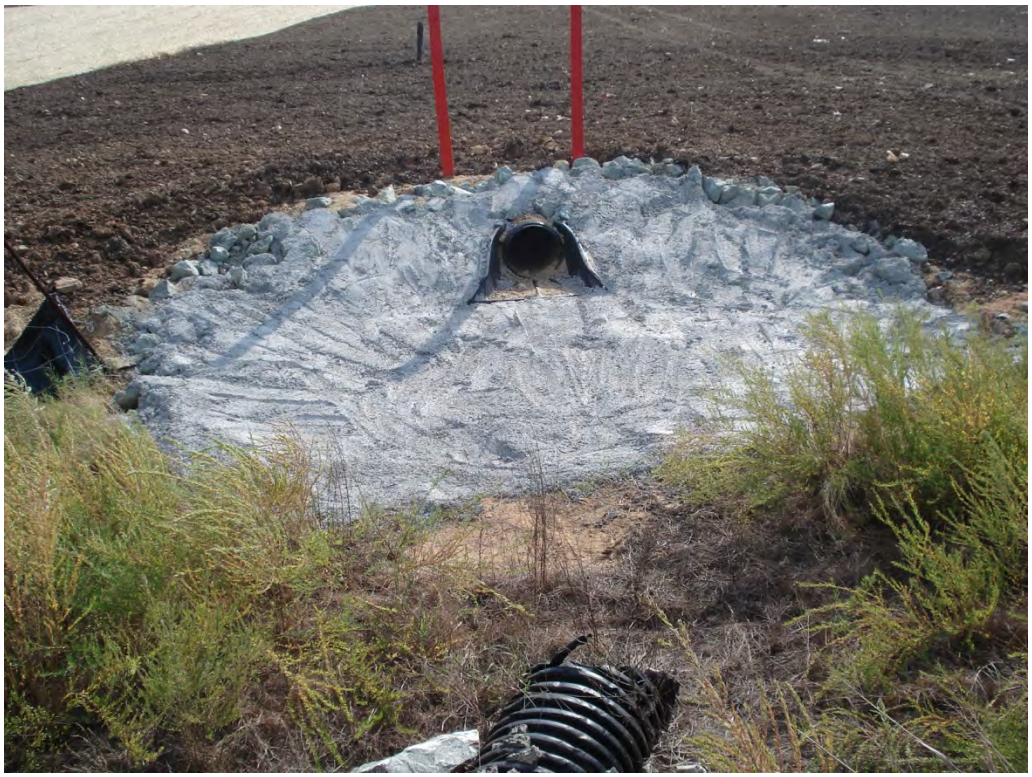
July 29, 2014 – Low permeability soil in Areas 13 and 14.

July 29, 2014 – Placing topsoil in Area 9.

August 27, 2014 – Installation of slope drain in Area 17.

September 16, 2014 – Topsoil in Areas 15 and 14.

September 16, 2014 – Erosion control matting in Areas 7, 9, 8, and 10.



October 10, 2014 – Typical grouted riprap slope drain inlet.

October 10, 2014 – Installing erosion control matting in Area 16.

October 10, 2014 – Vegetation in Areas 6, 4, 2, and 1.

October 10, 2014 – Erosion control matting in Areas 5, 7, 9, and 8.

October 10, 2014 – Erosion control matting in Areas 13 and 14.

October 10, 2014 – Erosion control matting in Areas 14 and 15.

October 10, 2014 – Erosion control matting in Area 17.

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A

Appendix A – CQC Testing (ECS Carolinas, LLP)

A1 Field Reports
A2 Borrow Source Characterization Study (On-Site Soil)
A3 Borrow Source Characterization Study (Off-Site Soil)
A4 Hydraulic Conductivity
A5 Atterberg Limits and Fines Content
A6 Moisture-Density Testing

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A1

Field Reports

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

February 28, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:

Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 1	02/26/2014	Sample Pick Up

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	1
Day & Date	Wednesday 02/26/2014
Weather	50°/ Sunny
On-Site Time	2.00
Lab Time	0.00
Travel Time*	0.50
Total	2.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Sample Pick Up**

Trip Charges* Tolls/Parking* Mileage* 40

Chargeable Items

Time of	Arrival	Departure
	10:30A	12:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to collect soil samples for testing in our laboratory.

By **Shannon G. Francisco** 1800

666609

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

March 25, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:

Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 2	03/21/2014	PR/Observation	Non Compliance Noted

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	2
Day & Date	Friday 03/21/2014
Weather	61°/ Sunny
On-Site Time	4.50
Lab Time	0.00
Travel Time*	0.50
Total	5.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

***** Non Compliance Noted *****

Remarks **PR/Observation**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	10:30A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the proofrolling of test strip prior to the placement of fill.

Using a loaded rubber tire vehicle the identified area was proofrolled and a slight surface movement was noticed on the north end of the test strip. This was pointed out to the general contractor's representative Roger with Triangle.
Please see the attached sketch for location.

While onsite the technician observed the placement and compaction of soils for test strip.
Please see the attached sketch for location.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, failed to met the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad or stakeout errors causing uncontrolled fill to be placed in structural areas.

The area will be dried, recompacted and tested again on Monday 3/24/14.

By **Terry G. Chrisco, — Field Technician** 1800

668951

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 03/21/14 Friday
Weather / Temp: 61°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

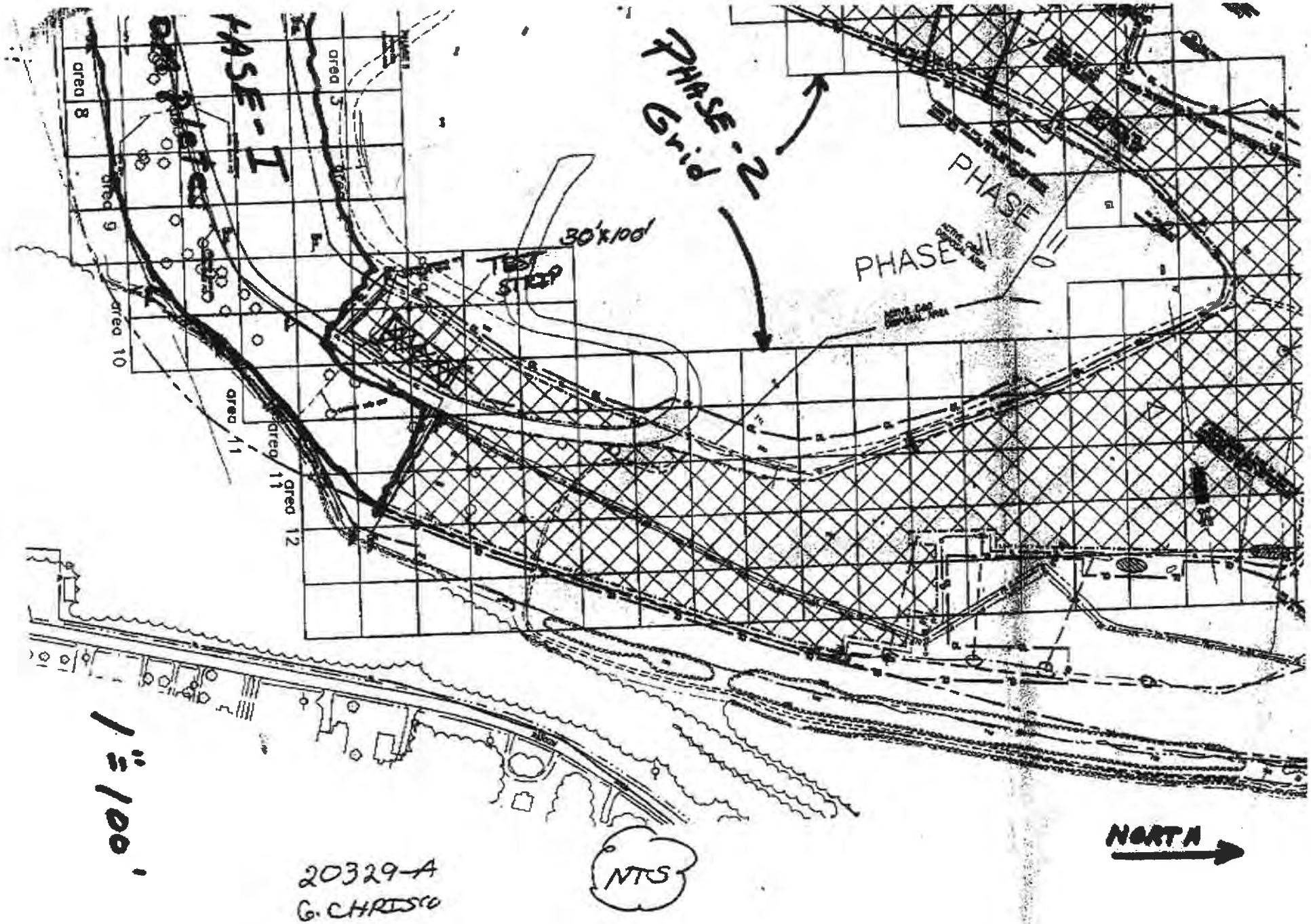
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 15'N, 15'W from SE corner of test strip	-1.50	5.350	1.090	4.260	.0341	124.9	200.00	167.90	19.1	104.8	D4S-3	90.7	95	F
2	Tested 8' S, 5'E from NW corner of test strip.	-1.50	5.220	1.090	4.130	.0341	121.1	200.00	162.20	23.3	98.2	D4S-3	85.0	95	F

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:251748



20329-A
G. CHRISCO
3-21-14

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 3, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 3	03/27/2014	Soil Density/PR

Sun Breza, P.E.
Construction Services Manager

Sun Breza, P.E.
Construction Services Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	3
Day & Date	Thursday 03/27/2014
Weather	41°/ Sunny
On-Site Time	6.75
Lab Time	0.00
Travel Time*	0.50
Total	7.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	10:30A	05:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid area 1 and 3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at test area 3 and elevation tested, failed to meet the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

At test areas 2 and 5 the areas will be proofrolled and if the area is stable the proofroll will be accepted over the density test. These tests are performed prior to the placement of fill.

At test area 3 there area will be scarified to help the material dry before recompacting.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

Note: Tom with HDR and Tim with White Street discussed with ECS technician Glen Chrisco that density tests are still needed but a proofroll will be what is accepted. There are no compaction specification to be met. Please see the attached meeting minutes.

While onsite the undersigned also observed the proofrolling of grid #3. Using a loaded rubber tire vehicle. The identified area was proofrolled and no visable signs of pumping or rutting

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FIELD REPORT

Project No. **09:20329-A**
Report No. **3**
Day & Date **Thursday 03/27/2014**

Project **White Street Landfilll Phase II Part 2**

were observed. Please see the attached sketch for the location of proofroll.

By **Terry G. Chrisco, — Field Technician** 1800

669736

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 03/27/14 Thursday
Weather / Temp: 41°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-1 Description: Red Orange Fine Sandy SILT Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 95.30 pcf Uncorrected Opt. MC: 23.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 15'N 47'E from SW corner of grid #1	-1.50	5.000	1.090	3.910	.0341	114.7	200.00	163.90	22.0	93.9	D4S-1	98.6	95	P
2	Tested 33'S, 5'W from SE corner of grid #3	-1.50	4.980	1.090	3.890	.0341	114.1	200.00	153.90	29.9	87.8	D4S-1	92.1	95	F
3	Tested 40'W,6'S from SE corner of grid #1	-1.00	4.930	1.090	3.840	.0341	112.6	200.00	150.10	33.2	84.5	D4S-1	88.6	95	F

*reobservation

Additional comments: Sample D4S-1 Test 2: proofroll accepted over density test ------
Sample D4S-8 Test 5: proofroll accepted over density test

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252010

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 03/27/14 Thursday
Weather / Temp: 41°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	ested 14'S,18'E from NW cor of grid #3	-1.50	5.480	1.090	4.390	.0341	128.7	200.00	170.80	17.0	109.9	D4S-6	98.3	95	P

Sample: D4S-8 Description: Green Tan Fine Silty SAND Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 109.50 pcf Uncorrected Opt. MC: 15.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
5	Tested 53'W, 64'S from SE corner of grid #3	-1.50	5.220	1.090	4.130	.0341	121.1	200.00	169.80	17.7	102.8	D4S-8	93.8	95	F

*reobservation

Additional comments: Sample D4S-1 Test 2: proofroll accepted over density test ------
Sample D4S-8 Test 5: proofroll accepted over density test

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252010

TIM WASON

CQC Testing Requirements

Low Permeability Soil Cap (Section 02276)

Borrow Soil Characterization Study – Triangle will use previous BSCS for on-site soils. Triangle still needs to submit BSCS for off-site soils.

Borrow Soils Conformance Testing

- Percent Fines (ASTM D1140) - 1 per 5,000 cy (approx. 13 tests)
- Atterberg Limits (ASTM D4318) - 1 per 5,000 cy (approx. 13 tests)
- Standard Proctor (ASTM D698) - 1 per 10,000 cy (approx. 7 tests)

Test Strip (separate test strips required for on-site and off-site soils). Testing frequencies below are for each test strip.

- Subgrade density (at least [redacted]% standard Proctor MDD) - at least 3 locations. USE PROOF ROLL NOT DENSITY TEST.
- Field density/moisture on compacted low permeability soil (ASTM D2922/3017) - at least 5 per lift (approx. 15 tests).
- Verification field density test (ASTM D1556 or D2937) - at least one test.
- Verification moisture test (ASTM D2216) - at least 5 tests.
- Composite sample from each lift for recompacted laboratory perm test (ASTM D5084) - 3 tests
- Thickness of completed test strip - at least 5 random locations.
- Random samples of material for moisture content (ASTM D2216), sieve analysis (ASTM D421, D422), and Atterberg limits (ASTM D4318) - at least 5.
- Standard Proctor compaction test on bag sample of low permeability soil (ASTM D 698) – at least one test.
- Modified Proctor compaction test on bag sample of low permeability soil (ASTM D 1557) - at least one test.
- Tube sample for hydraulic conductivity testing - at least one per lift (approx. 3 tests). Tubes must be taken within 2ft of in-situ field density and moisture test.

Field Quality Control

- Field Density (ASTM D2922) (at least 95%) - 1 per every 2 acres (approx. 13 tests)
- Field Density Verification (ASTM D2937) - at least one test.
- Field Moisture (ASTM D3017) - 1 per every 2 acres (approx. 13 tests)
- Thickness - 8 locations per acre (approx. 200 tests)
- Atterberg Limits (ASTM D4318) - 1 per every 2 acres (approx. 13 tests)
- Fines Content (ASTM D1140) - 1 per every 2 acres (approx. 13 tests)
- Hydraulic Conductivity (ASTM D5084) - 1 per every 5 acres (approx. 5 tests)
- Standard Proctor (ASTM D 698) - 1 per every 2 acres (approx. 13 tests)

Earthwork (Section 02220) - applies to backfilling and subgrade

- Field Density (at least 95% MDD) - 1 test per lift per 10,000 sf.

Trenching, Backfilling, and Compacting for Utilities (Section 02221)

- Field Density for bedding material and carefully compacted backfill (at least 95% MDD)
- Field Density for common trench backfill (at least 95% MDD beneath roadways and 85% beneath non-traffic areas)

HDR | ONE COMPANY *Many Solutions*™

Meeting Agenda

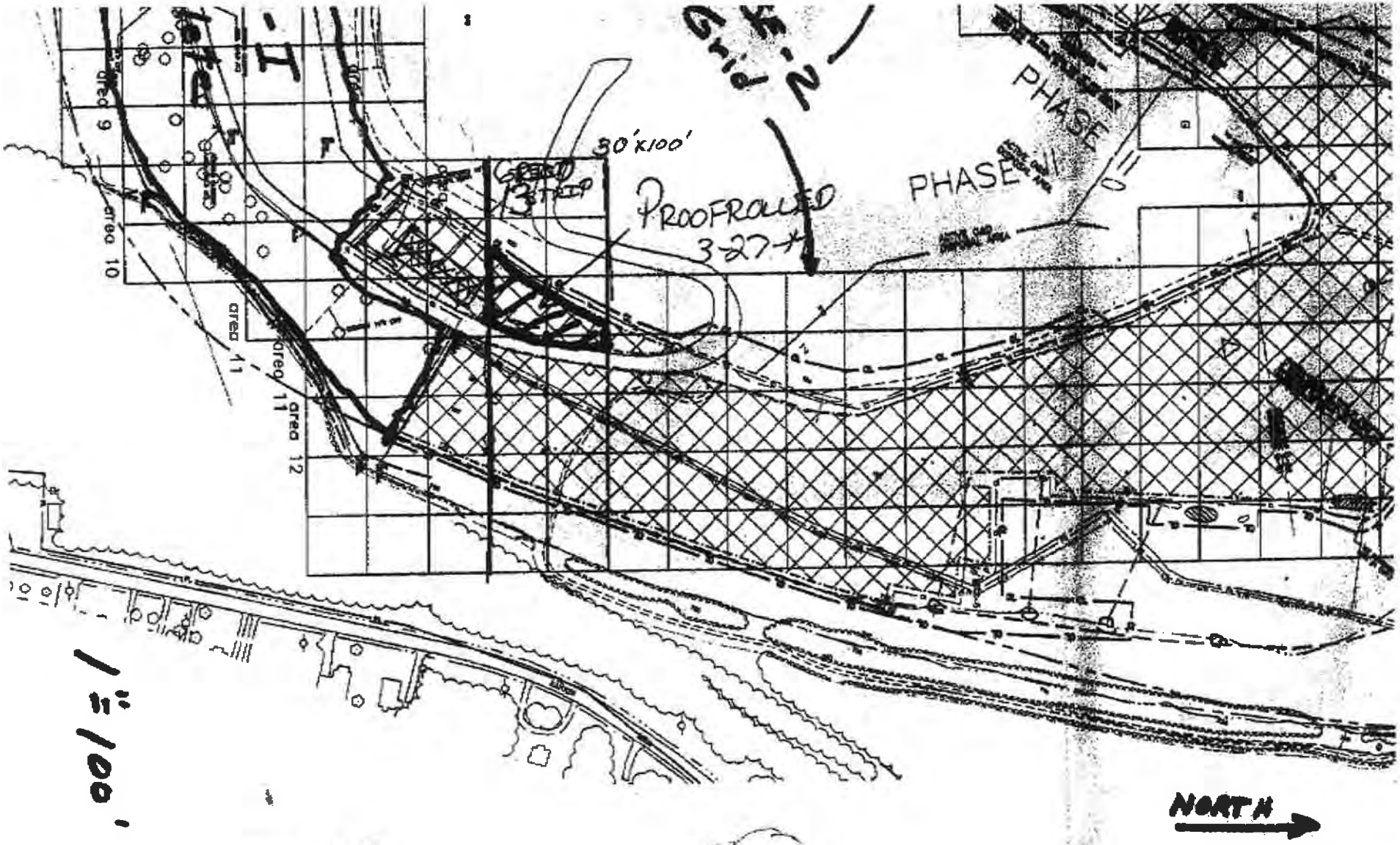
Subject: Construction Progress Meeting No. 1	
Client: City of Greensboro	
Project: White Street Landfill Phase II, Part 2 Partial Closure	Project No: 06770-109019-018
Meeting Date: Thursday, March 27, 2014 @ 10:00 am	Meeting Location: White Street Landfill Scalehouse

Attendance:

Greensboro	HDR	Triangle

Topics for Discussion:

1. Survey Status
2. Work accomplished
3. Work planned (next 14 days)
4. Schedule
5. Status of submittals
6. RFI's /Field Orders/ CPR's/CO's
7. Status of CQA/CQC testing and inspection
8. Pay Request
9. Other



20329-B
G. CHRISCO
3-27-14

NTS

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 3, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:
Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 4	03/28/2014	Soil Density/SPU
Field Report # 6	03/31/2014	Soil Density
Field Report # 8	04/01/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	4
Day & Date	Friday 03/28/2014
Weather	41°/ Cloudy
On-Site Time	7.25
Lab Time	0.00
Travel Time*	0.50
Total	7.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/SPU**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:45A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #1.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at test areas and elevations tested, met the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

While onsite the undersigned pick up one 5 gallon bucket of soils for standard Proctor testing and moisture content.

By **Terry G. Chrisco, — Field Technician** 1800

669900

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 03/28/14 Friday
Weather / Temp: 41°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-2b Description: Red brown fine-med sandy silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Retest of #1 from 3-27-14	-1.00	5.050	1.090	3.960	.0341	116.1	200.00	150.70	32.7	87.4	D4S-2b	98.5	95	P
2	48ft N, 64ft W from SE corner of grid #3	-1.00	5.000	1.090	3.910	.0341	114.7	200.00	153.20	30.5	87.8	D4S-2b	98.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252091

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	6
Day & Date	Monday 03/31/2014
Weather	41°/ Sunny
On-Site Time	6.25
Lab Time	0.00
Travel Time*	1.00
Total	7.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	07:45A	08:00A
	11:00A	05:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 3 and 2.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

The technician arrived on site at 7:45 AM, Roger with Triangle Grading and Asphalt said that they were not going to place fill until lunch time due to the soil being too wet and trucks were not able to get into the borrow pit. The technician left the project and returned in the afternoon.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 03/31/14 Monday
Weather / Temp: 41°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-2b Description: Red brown f-m sandy silt. Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 61ft E, 84ft N from SW cor of grid 1.	-1.00	5.020	1.090	3.930	.0341	115.3	200.00	152.00	31.5	87.6	D4S-2b	98.6	95	P
4	Tested 30ft W, 34ft S from NE cor of grid #3.	-1.00	4.940	1.090	3.850	.0341	112.9	200.00	150.60	32.8	85.0	D4S-2b	95.7	95	P
5	Tested 20ft E, 53ft S from NW cor of grid #3.	-1.00	4.970	1.090	3.880	.0341	113.8	200.00	151.80	31.7	86.3	D4S-2b	97.2	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252159

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 03/31/14 Monday
Weather / Temp: 41°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-6b Description: Red brown f-m sandy silt. Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 25.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 6ft S, 40ft E from NW cor of grid 1.	-1.00	5.060	1.090	3.970	.0341	116.4	200.00	156.40	27.8	91.0	D4S-6b	99.4	95	P
3	Tested 45ft N, 39ft W from SE cor of grid 1.	-1.00	5.000	1.090	3.910	.0341	114.7	200.00	154.40	29.5	88.5	D4S-6b	96.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252159

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	8
Day & Date	Tuesday 04/01/2014
Weather	41°/ Sunny
On-Site Time	8.75
Lab Time	0.00
Travel Time*	0.50
Total	9.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:15A	05:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 1, 2 and 3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

Note: Density test performed at grid #2 were prior to the placement of fill

While onsite the undersigned also observed the proofrolling of grid #2. Please see the attached sketch for location. Using a loaded rubber tire vehicle, the identified area was proofrolled and no visible signs of pumping or rutting were observed.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/01/14 Tuesday
Weather / Temp: 41°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-12b Description: Red brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.30 pcf Uncorrected Opt. MC: 28.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 80ft W, 30 ft N from SE corner of grid #3.	-1.00	5.080	1.100	3.980	.0341	116.7	200.00	151.60	31.9	88.4	D4S-12	96.8	95	P
2	Tested 27ft N, 15ft E from SW corner of grid #3	-1.00	5.050	1.100	3.950	.0341	115.8	200.00	152.40	31.2	88.2	D4S-12	96.6	95	P
6	Tested 51ft N, 46ft W from SE cor of grid #1	-0.50	5.010	1.100	3.910	.0341	114.7	200.00	157.40	27.0	90.2	D4S-12	98.8	95	P
7	Tested 59ft W, 82ft N from SE cor of grid #1	-0.50	5.080	1.100	3.980	.0341	116.7	200.00	156.20	28.0	91.1	D4S-12	99.8	95	P
8	Tested 69ft W, 129ft N from SE cor of grid #1. at minus 6	-0.50	5.060	1.100	3.960	.0341	116.1	200.00	156.00	28.2	90.5	D4S-12	99.1	95	P

*reobservation

Additional comments: Sample D4S-13b Test 3: subgrade test prior to placement of fill ------ Sample D4S-13b Test 4: subgrade test prior to placement of fill ------ Sample D4S-13b Test 5: subgrade test prior to placement of fill

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252239

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/01/14 Tuesday
Weather / Temp: 41°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-13b Description: Tan brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

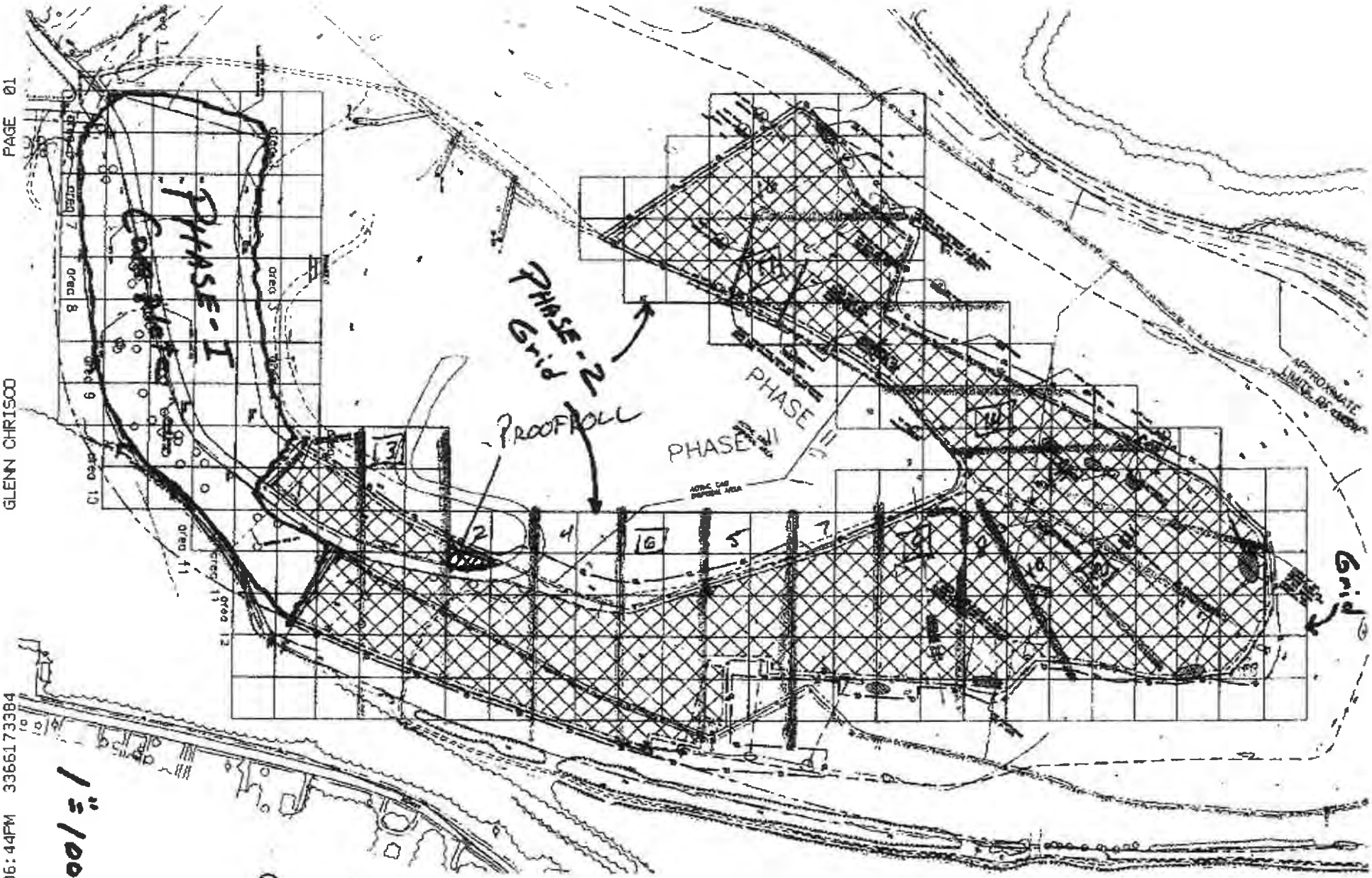
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Testd 109 ft S, 34 ft W from NE corner of grid #2	-1.50	5.310	1.100	4.210	.0341	123.5	200.00	168.00	19.0	103.7	D4S-13	98.7	95	P
4	Tested 35ft N, 12ft E from NW corner of grid #2	-1.50	5.220	1.100	4.120	.0341	120.8	200.00	172.00	16.2	103.8	D4S-13	98.8	95	P
5	Tested 54ft W, 20ft N from SW corner of grid #2	-1.50	5.190	1.100	4.090	.0341	119.9	200.00	171.50	16.6	102.8	D4S-13	97.8	95	P

*reobservation

Additional comments: Sample D4S-13b Test 3: subgrade test prior to placement of fill ------ Sample D4S-13b Test 4: subgrade test prior to placement of fill ------ Sample D4S-13b Test 5: subgrade test prior to placement of fill

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252239



PROOFROLL
GRID # 2

20329-B
G. CHRISCO
4-1-14

NORTH

NTS

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 1, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 7 03/31/2014 Lab Results

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	7
Day & Date	Monday 03/31/2014
Weather	
On-Site Time	0.00
Lab Time	0.25
Travel Time*	0.00
Total	0.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Lab Results**

Trip Charges* Tolls/Parking* Mileage*

Chargeable Items

Time of	Arrival	Departure
	10:00A	10:00A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

ECS Carolinas, LLP has completed Hydraulic Conductivity Testing of 12 samples from the borrow pit site for use on the low permeability soil cap. The tests were performed in accordance with ASTM D 5084.

The test results indicated that each sample exceeded the project specification requirement of 1.0x10-5 cm/sec with the exception of samples D4S-2 and D4S-12.

By **Timothy R. Brister, — Laboratory Manager** 1310

669919

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 5, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 9	04/02/2014	Soil Density
Field Report # 10	04/03/2014	Soil Density/PR

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	9
Day & Date	Wednesday 04/02/2014
Weather	80°/ Sunny
On-Site Time	4.00
Lab Time	0.25
Travel Time*	1.00
Total	5.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	08:30A	12:00P
	02:15P	02:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 1 and 3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard. Test area 3 did not meet the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard. This area will be scarified to help the soil dry prior to recompacting.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible stakeout errors causing uncontrolled fill to be placed in structural areas.

The technician also picked up one 5 gallon bucket of soils for standard Proctor testing.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/02/14
Weather / Temp: 80°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-12b Description: Red Brown Fine to Medium Sandy Silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.30 pcf Uncorrected Opt. MC: 28.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	%2ft N, 30ft W from NW cor of grid #3.	-1.00	5.100	1.100	4.000	.0341	117.3	200.00	156.50	27.7	91.7	D4S-12	100.5	95	P
2	Tested 98ft S, 34ft W from SE cor. of grid #3.	-1.00	5.040	1.100	3.940	.0341	115.5	200.00	155.70	28.4	89.9	D4S-12	98.4	95	P
3	Tested N,7ft W from 8ft SE cor of test strip.on grid #1.	0.00	4.930	1.090	3.840	.0341	112.6	200.00	149.30	33.9	84.0	D4S-12	92.0	95	F

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252291

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	10
Day & Date	Thursday 04/03/2014
Weather	70°/ Cloudy
On-Site Time	6.25
Lab Time	0.00
Travel Time*	0.50
Total	6.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	09:00A	03:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 1, 2 and 3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

While onsite the undersigned also observed the proofrolling of lower section of grid #3. Please see the attached sketch for location of proofroll.

Using a loaded rubber tire vehicle the identified area was proofrolled and no visible signs of pumping or rutting was observed.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/03/14 Thursday
Weather / Temp: 70°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-13b Description: Tan Brown Fine to Medium Sandy Silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 90ft N, 41ft E from SW corner of grid #3	1.50	5.120	1.080	4.040	.0341	118.5	200.00	170.10	17.5	100.7	D4S-13	95.8	95	P
2	Tested 134ft E, 80ft S from NW corner of grid #3 below roadway	1.50	5.170	1.120	4.050	.0341	118.7	200.00	168.40	18.7	99.9	D4S-13	95.0	95	P

Sample: D4S-2b Description: Red Brown Fine to Medium Sandy Silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	69ftN, 39ft W from SE corner of grid #2	1.00	5.040	1.120	3.920	.0341	115.0	200.00	151.30	32.1	86.9	D4S-2b	97.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252354

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/03/14 Thursday
Weather / Temp: 70°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-7b Description: Red Brown Fine to Medium Sandy Silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 83.90 pcf Uncorrected Opt. MC: 30.60 %

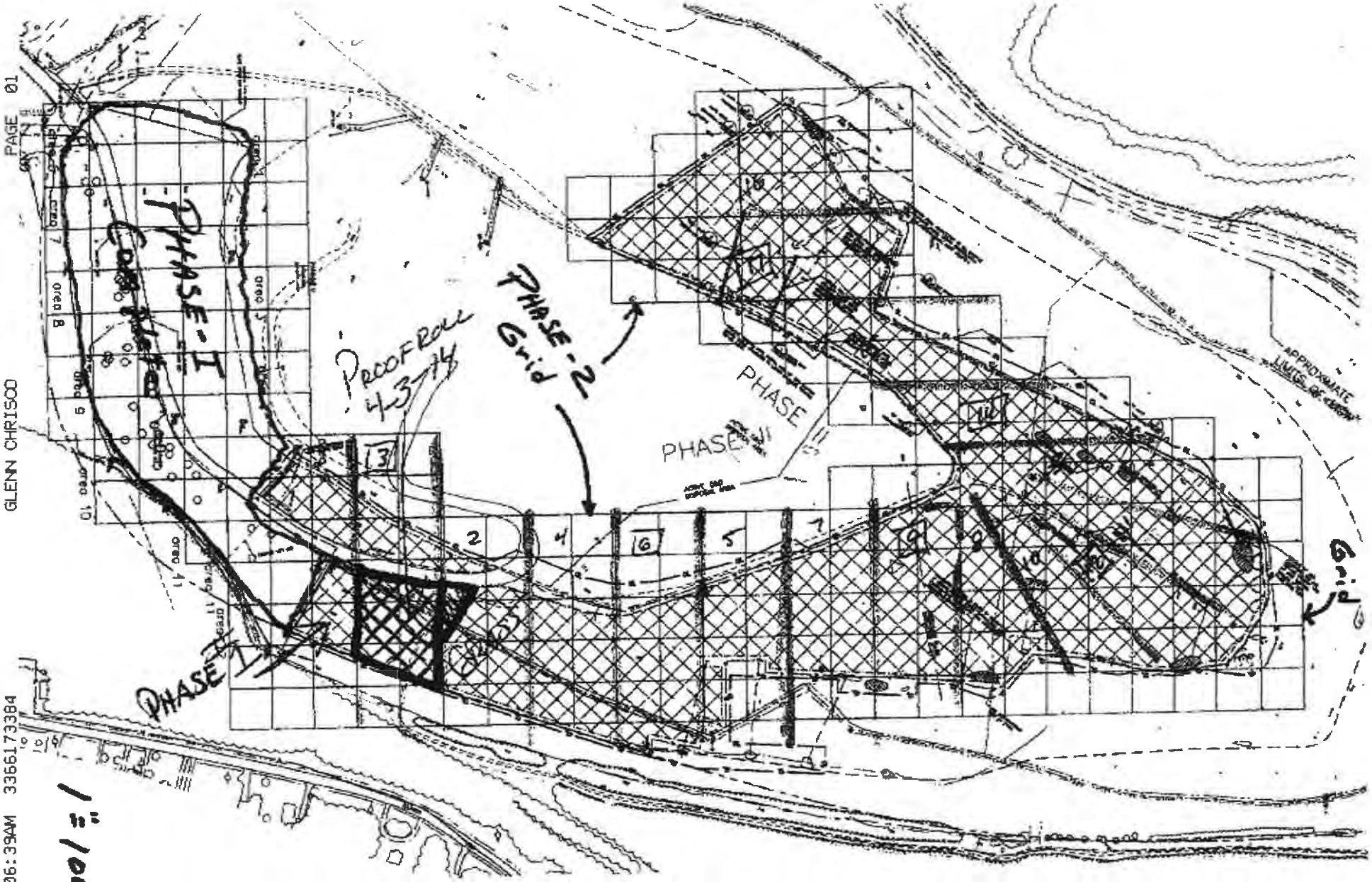
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Retest from 4-2-14, 8ft N, 7ft W from SE corner of test strip.	0.00	4.890	1.090	3.800	.0341	111.4	200.00	147.10	35.9	81.9	D4S-7b	97.6	95	P
5	Tested 100ft N, 25ft W from SE corner of grid #3	0.50	4.790	1.080	3.710	.0341	108.8	200.00	150.10	33.2	81.6	D4S-7b	97.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252354



20239
WHITE ST. LANDFILL - CAP

NTS

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 6, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 11 04/04/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	11
Day & Date	Friday 04/04/2014
Weather	66°/ Cloudy
On-Site Time	4.75
Lab Time	0.50
Travel Time*	0.50
Total	5.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	12:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 2 and 3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

670312

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/04/14 Friday
Weather / Temp: 66°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-2b Description: Red brown Fine to Medium Sandy Silt. Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	tested 27 ft N, 55ft W from SE corner of Grid # 2	0.00	4.860	1.120	3.740	.0341	109.7	200.00	150.80	32.6	82.7	D4S-2b	93.1	95	F
2	tested 27 ft N, 55ft W from SE corner of Grid # 2	0.00	4.910	1.100	3.810	.0341	111.7	200.00	155.50	28.6	86.8	D4S-2b	97.8	95	P
3	Tested 92ft S, 26ft W from SE corner of grid #2	0.00	4.920	1.100	3.820	.0341	112.0	200.00	149.60	33.6	83.7	D4S-2b	94.3	95	F
4	tested 92ft S, 26ft W from SE corner of grid #2	0.00	4.950	1.100	3.850	.0341	112.9	200.00	155.00	29.0	87.4	D4S-2b	98.5	95	P
5	24ft W, 15ft S from NE corner of grid #3	0.00	4.980	1.100	3.880	.0341	113.7	200.00	153.50	30.2	87.2	D4S-2b	98.2	95	P

*reobservation

Additional comments: Sample D4S-2b Test 2: Retest of test 1 ------ Sample D4S-2b Test 4: Retest of test 3

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252456

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 8, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 12	04/05/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	12
Day & Date	Saturday 04/05/2014
Weather	56°/ Sunny
On-Site Time	4.50
Lab Time	0.00
Travel Time*	0.75
Total	5.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	12:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids #1 and #3 on the lower section below the roadway.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

670350

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/05/14 Saturday
Weather / Temp: 56°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-2b Description: Red Brown Fine to Medium sandy silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 6ft S, 40ft W from NE cor of grid #1 lower end below roadway,1st lift	-1.00	4.910	1.060	3.850	.0341	112.9	200.00	155.60	28.5	87.8	D4S-2b	98.9	95	P
2	Tested 78ft E, 60ft N from SW cor of grid #3 lower end, below roadway, 1st lift	-1.00	4.880	1.070	3.810	.0341	111.7	200.00	154.90	29.1	86.5	D4S-2b	97.4	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252457

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 11, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:

Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 13	04/10/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	13
Day & Date	Thursday 04/10/2014
Weather	60°/ Sunny
On-Site Time	8.00
Lab Time	0.00
Travel Time*	0.50
Total	8.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks	Soil Density					
Trip Charges*		Tolls/Parking*	Mileage*	28	Time of	Arrival / Departure
Chargeable Items	1 - Basic Equipment					07:45A / 03:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids #3 and #4, grid #3 is fill placement grid #4 tested prior to fill placement.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

While onsite the technician also observed the proofrolling of grids. Please see the attached sketch.

Using loaded rubber tire vehicle the identified area was proofrolled and no visible signs of pumping or rutting were observed.

By **Terry G. Chrisco, — Field Technician** 1800

670866

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/10/14 Thursday
Weather / Temp: 60°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested prior to fill, 36'S, 69'W from NE corner of grid #4	-1.50	5.110	1.060	4.050	.0341	118.8	200.00	173.20	15.4	102.8	D4S-17	97.8	95	P

Sample: D4S-19 Description: Tan Brown Silty Fine to Medium SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.40 pcf Uncorrected Opt. MC: 14.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested prior to fill , 33'N, 71'E from SW corner of grid #4	-1.50	5.220	1.060	4.160	.0341	122.0	200.00	180.00	11.1	109.8	D4S-19	98.5	95	P

*reobservation

Additional comments: Sample D4S-24 Test 1: 1st lift on grid #3 lower side of roadway ------ Sample D4S-24 Test 2: 1st lift on grid #3 lower side ------ Sample D4S-24 Test 5: lift #2 on grid #3 lower side of roadway

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252681

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/10/14 Thursday
Weather / Temp: 60°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-24 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 25.90 %

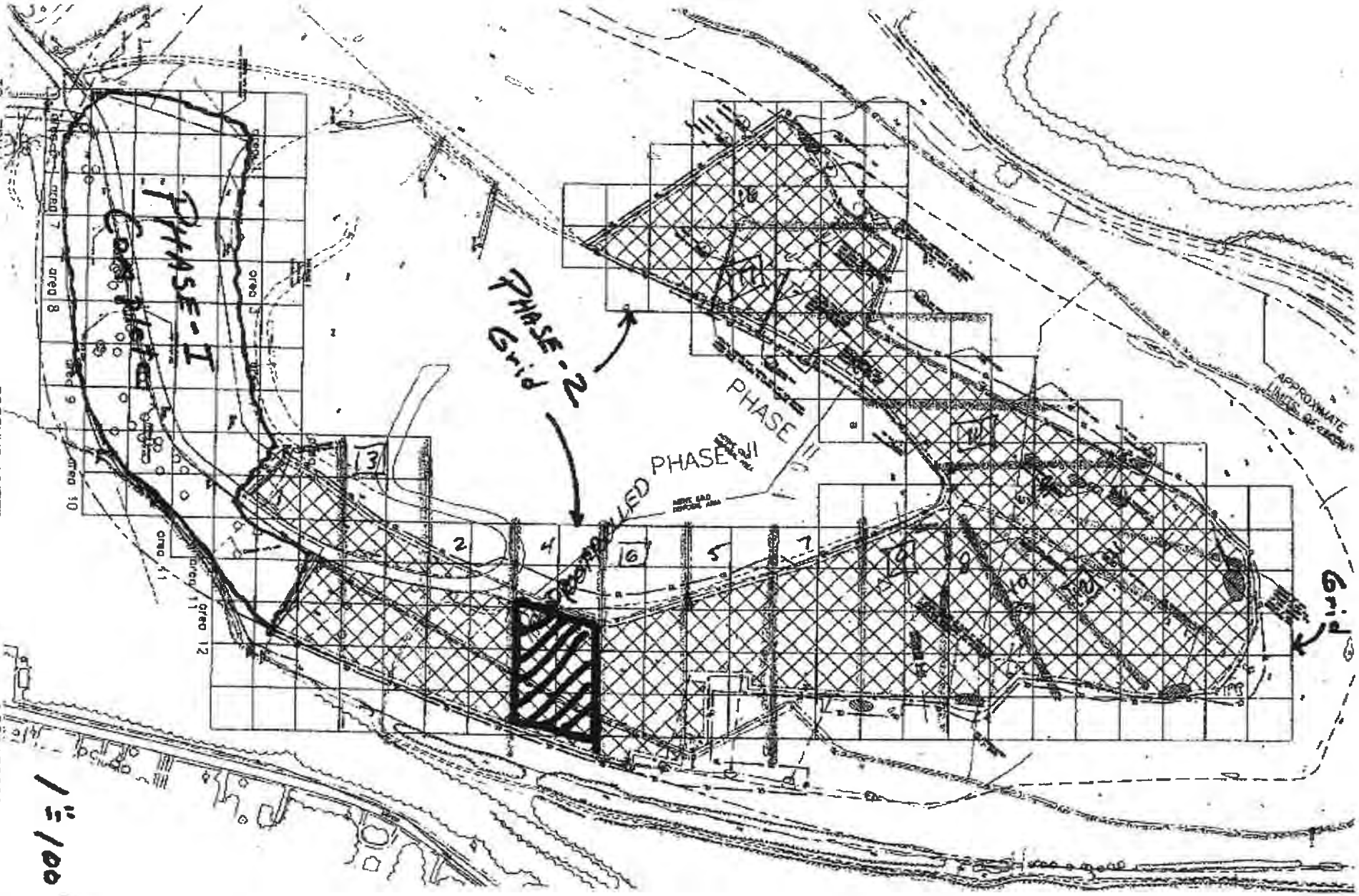
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 12' S, 41'E from NW corner of grid #3 lower side	-1.00	4.840	1.060	3.780	.0341	110.8	200.00	162.80	22.8	90.1	D4S-24	98.5	95	P
2	Tested 71' W, 86'S from NE corner of grid #3 lower side	-1.00	4.820	1.060	3.760	.0341	110.3	200.00	158.90	25.8	87.6	D4S-24	95.7	95	P
5	Tested 18'N, 41' E from SW corner of grid #3 lower side of roadway	-0.50	4.940	1.060	3.880	.0341	113.8	200.00	155.00	29.0	88.1	D4S-24	96.3	95	P

*reobservation

Additional comments: Sample D4S-24 Test 1: 1st lift on grid #3 lower side of roadway ------ Sample D4S-24 Test 2: 1st lift on grid #3 lower side ------ Sample D4S-24 Test 5: lift #2 on grid #3 lower side of roadway

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252681



PROOFROLL GRID

20329-A
G. CHRISCO

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 11, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 14 04/11/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	14
Day & Date	Friday 04/11/2014
Weather	60°/ Sunny
On-Site Time	7.25
Lab Time	0.00
Travel Time*	0.50
Total	7.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	08:00A	03:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 2 and 3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

671078

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/11/14 Friday
Weather / Temp: 60°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-15 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 27.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 9'S, 24'E from SW corner of grid #3 lower side below roadway	-0.50	4.910	1.060	3.850	.0341	112.9	200.00	160.00	25.0	90.3	D4S-15	98.7	95	P

Sample: D4S-25 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 83.90 pcf Uncorrected Opt. MC: 30.60 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	23'N, 61'S from SW corner of grid #2 lower side below roadway	-0.50	4.710	1.060	3.650	.0341	107.0	200.00	155.50	28.6	83.1	D4S-25	99.1	95	P
3	Tested 45'E,14' N from SW cor of grid #2, lower side of roadway	-0.50	4.780	1.060	3.720	.0341	109.1	200.00	151.20	32.2	82.4	D4S-25	98.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252717

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 14, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 15 04/12/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	15
Day & Date	Saturday 04/12/2014
Weather	60°/ Sunny
On-Site Time	5.00
Lab Time	0.00
Travel Time*	0.50
Total	5.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	01:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

671181

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/12/14 Saturday
Weather / Temp: 60°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-15 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 27.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 33'S, 23'E from NW corner of grid #3 lower side of roadway.	0.00	5.020	1.060	3.960	.0341	116.1	200.00	156.20	28.0	90.6	D4S-15	99.0	95	P

Sample: D4S-25 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 83.90 pcf Uncorrected Opt. MC: 30.60 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 62'E, 67'S from NW corner of grid #3 lower side of roadway	0.00	4.760	1.060	3.700	.0341	108.5	200.00	153.90	29.9	83.4	D4S-25	99.5	95	P

*reobservation

Additional comments: Sample D4S-15 Test 1: Grid #3 is complete as of 4/12/14 ------
Sample D4S-25 Test 2: Grid #3 is complete as of 4/12/14

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252718

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 16, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 16 04/14/2014 Soil Density/SPU

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	16
Day & Date	Monday 04/14/2014
Weather	64°/ Cloudy
On-Site Time	4.75
Lab Time	0.00
Travel Time*	1.00
Total	5.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/SPU**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	09:00A	01:00P
	02:45P	03:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid 4.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad or stakeout errors causing uncontrolled fill to be placed in structural areas.

Also while onsite the technician extracted another tube for permeability testing.

By **Terry G. Chrisco, — Field Technician** 1800

671489

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/14/14 Monday
Weather / Temp: 64°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-2 Description: Red Brown Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 38ft N, 45ft E from NW corner of grid #4	-1.00	4.910	1.070	3.840	.0341	112.6	200.00	154.40	29.5	86.9	D4S-2	97.8	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:252825

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 25, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

ENCL:

Field Report # 17	04/23/2014	Soil Density
Field Report # 18	04/24/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	17
Day & Date	Wednesday 04/23/2014
Weather	51°/ Sunny
On-Site Time	3.75
Lab Time	0.00
Travel Time*	0.75
Total	4.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	11:30A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids #2 and #4.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

672675

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/23/14
Weather / Temp: 51°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-15 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 27.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 26' S, 62'W from NE cor of grid #2 Lift 1.	-1.00	4.900	1.070	3.830	.0341	112.3	200.00	158.90	25.8	89.2	D4S-15	97.5	95	P
2	Tested 35'N, 78'E from SW cor of grid #4	-1.00	5.020	1.070	3.950	.0341	115.8	200.00	153.60	30.2	88.9	D4S-15	97.1	95	P
3	Tested 15'S, 99'E from NW cor of Grid #4, lift 1	-1.00	4.920	1.070	3.850	.0341	112.9	200.00	160.00	25.0	90.3	D4S-15	98.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253176

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	18
Day & Date	Thursday 04/24/2014
Weather	58°/ Sunny
On-Site Time	2.75
Lab Time	0.00
Travel Time*	0.75
Total	3.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	10:45A	01:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for for grids 2/4.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

672870

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/24/14 Thursday
Weather / Temp: 58°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-15 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 27.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 128' E, 8'S from NW cor of grid #2. Lift 2	-0.50	5.050	1.060	3.990	.0341	117.0	200.00	154.70	29.2	90.4	D4S-15	98.9	95	P
2	Tested 78'N, 130'E from SW cor of grid #4. Lift #2.	0.50	4.920	1.060	3.860	.0341	113.4	200.00	154.40	29.5	87.5	D4S-15	95.6	95	P
3	Tested 111'E, 20'S from NW cor of grid #4. Lift #2.	0.50	4.890	1.060	3.830	.0341	112.3	200.00	156.00	28.2	87.5	D4S-15	95.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253269

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

April 29, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 19	04/28/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	19
Day & Date	Monday 04/28/2014
Weather	62°/ Cloudy
On-Site Time	4.50
Lab Time	0.00
Travel Time*	0.75
Total	5.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	09:45A	02:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #4.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

673192

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 04/28/14 Monday
Weather / Temp: 62°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-15 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 27.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 23'S, 10'E from NW corner of grid #4, lift #3	0.00	5.140	1.060	4.080	.0341	119.7	200.00	155.10	28.9	92.8	D4S-15	101.4	95	P
2	Tested 41'S, 28'W from NE cor of grid #4, lift #3.	0.00	4.900	1.060	3.840	.0341	112.6	200.00	156.40	27.8	88.0	D4S-15	96.2	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253505

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 2, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 20	05/01/2014	Proofroll

Ronald R. Newman, CWI
Corporate NDT Level III

Adrian L. Gaylord
Project Manager

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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	20
Day & Date	Thursday 05/01/2014
Weather	75°/ Sunny
On-Site Time	1.75
Lab Time	0.00
Travel Time*	1.00
Total	2.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Proofroll**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	03:30P	05:15P

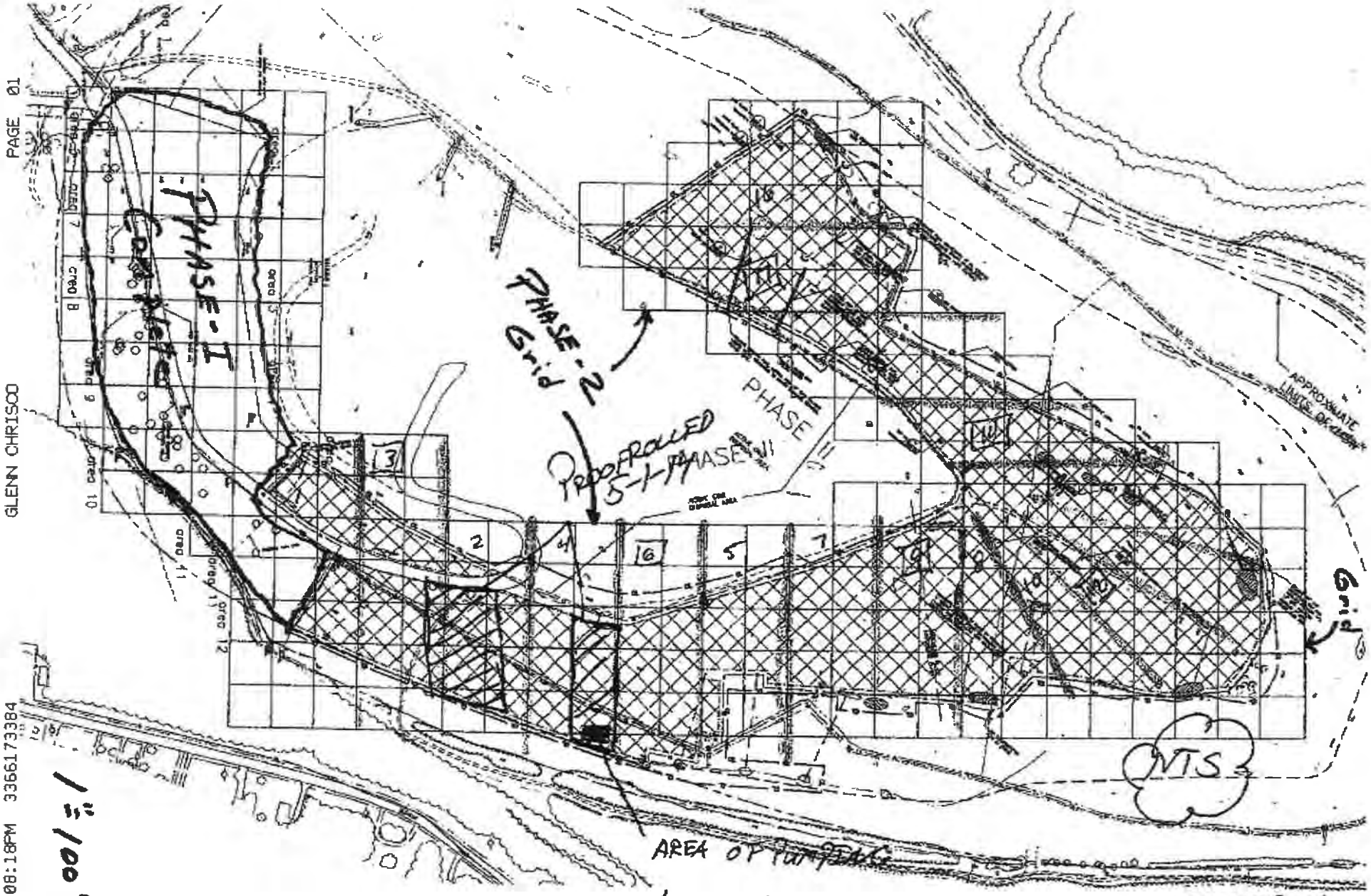
* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on-site, as requested, to observe proofrolling of grids 2, 3 and 4. Please see the attached sketch for areas proofrolled. Part of these grids have already been covered with the capping material.

Using a loaded rubber tire vehicle the identified area was proofrolled and no visible signs of pumping or rutting was observed on grids 2 and 3 some pumping and rutting was observed at the NE corner of grid #4. The contractor represenative Roger Jackson wants to try ripping the area and letting the wet material dry and recompact.

By **Terry G. Chrisco, — Field Technician** 1800



L 60' x W 30'

NOT UNDERCUT HAS BEEN AS OF 5/1

20329-A
G. CHRISOD
5-1-14

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 5, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 21	05/02/2014	Soil Denisty

Ronald R. Newman, CWI
Corporate NDT Level III

Adrian L. Gaylord
Project Manager

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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	21
Day & Date	Friday 05/02/2014
Weather	68°/ Sunny
On-Site Time	1.75
Lab Time	0.00
Travel Time*	0.50
Total	2.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks: Soil Denisty

Trip Charges* Tolls/Parking* Mileage* 28

Chargeable Items 1 - Basic Equipment

Time of	Arrival	Departure
	02:45P	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #4.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

673504

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/02/14 Friday
Weather / Temp: 68°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-14 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.10 pcf Uncorrected Opt. MC: 29.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 106'S,41'W from NE cor of grid #4 lower section lift 1.	-1.00	4.900	1.070	3.830	.0341	112.3	200.00	152.00	31.5	85.3	D4S-14	96.8	95	P

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 25'S, 50'W from NE cor of grid #4lower section, prior to first lift.	-1.50	5.230	1.070	4.160	.0341	122.0	200.00	162.00	23.4	98.8	D4S-26	95.5	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253693

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 9, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:

Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 22	05/05/2014	Soil Density/UC/Obse

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	22
Day & Date	Monday 05/05/2014
Weather	59°/ Sunny
On-Site Time	7.00
Lab Time	0.00
Travel Time*	0.75
Total	7.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks: Soil Density/UC/Obse

Trip Charges* Tolls/Parking* Mileage* 28

Chargeable Items 1 - Basic Equipment

Time of	Arrival	Departure
	08:00A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid 2/4.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Note: An undercut of unsuitable soil was requested by Jason with the landfill, at the NE corner of grid #4. Please see the attached sketch for the location. The area measured L50ft x W25.6ft x H1.7ft totaling 78.6 cubic yards.

Please see the attached photo.

By **Terry G. Chrisco, — Field Technician** 1800

673869

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/05/14 Monday
Weather / Temp: 59°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-15 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 27.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 62'E,35'S from NW cor of grid #4. Lift 2.	-0.50	4.980	1.070	3.910	.0341	114.7	200.00	156.80	27.5	89.9	D4S-15	98.2	95	P

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 58'S, 49'E from NW cor of grid #2, Prior to fill	-1.50	5.260	1.070	4.190	.0341	122.9	200.00	169.20	18.2	103.9	D4S-17	98.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253740

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/05/14 Monday
Weather / Temp: 59°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-21 Description: Red Brown Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 82.10 pcf Uncorrected Opt. MC: 35.50 %

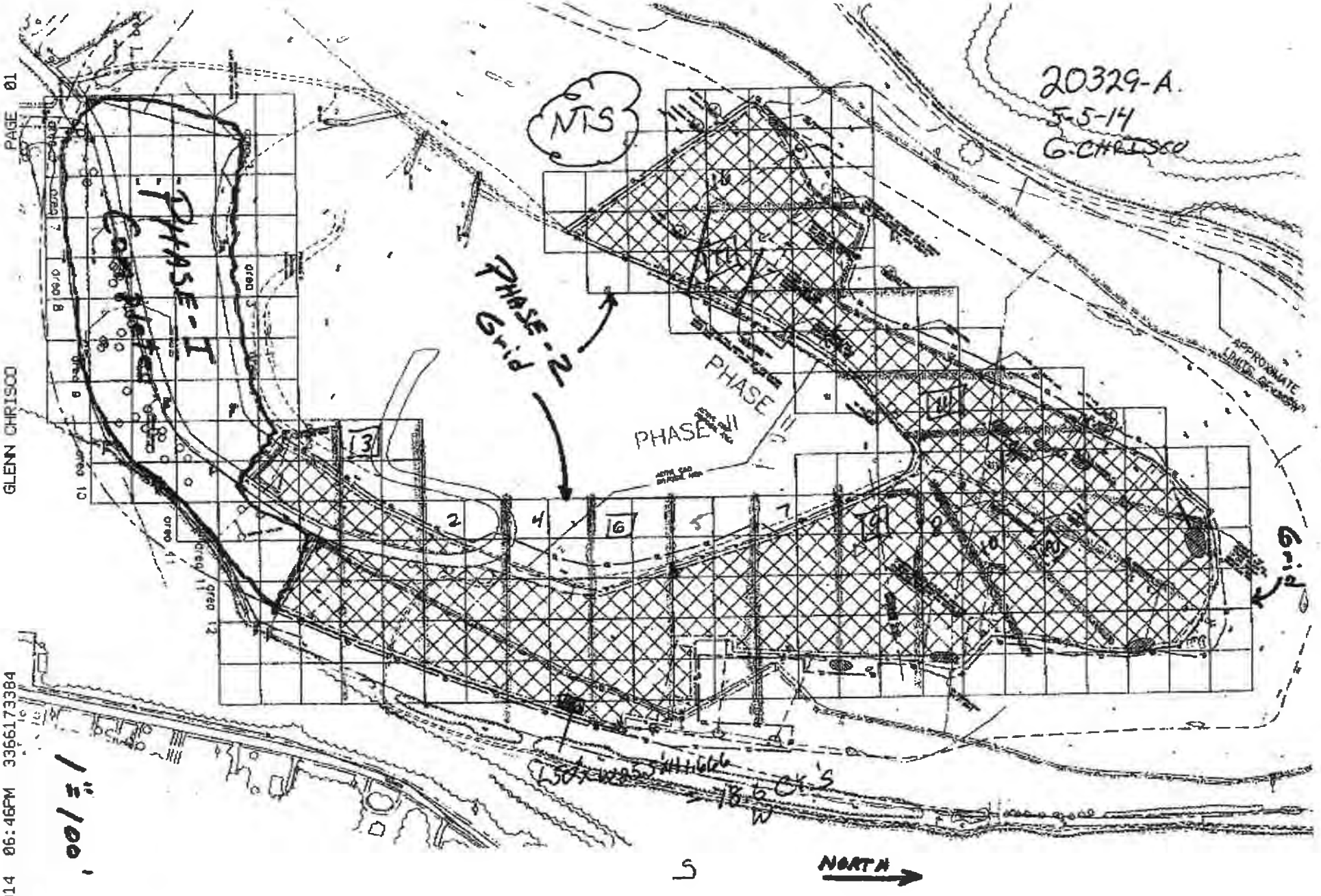
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 83'W, 25'S from NE cor of grid #2. Lift 2	-0.50	4.850	1.070	3.780	.0341	110.9	200.00	143.00	39.8	79.2	D4S-21	96.5	95	P
4	Tested 10'N, 69'E from NW cor of grid #4. Lift 2.	-0.50	4.880	1.070	3.810	.0341	111.7	200.00	146.90	36.1	82.0	D4S-21	99.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253740


20329-A.
5-5-14
G. CHRISCO
NTS
PHASE-I
PHASE-2 Grid
PHASE
PHASE II
APPROXIMATE LIMITS OF GROUND
Grid
NORTH
S
E
1" = 100'

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 8, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 23	05/06/2014	Soil Density/PR
Field Report # 24	05/07/2014	Soil Denisty

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	23
Day & Date	Tuesday 05/06/2014
Weather	80°/ Sunny
On-Site Time	5.25
Lab Time	0.00
Travel Time*	0.75
Total	6.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	10:00A	03:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grids 2/3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

While onsite the undersigned observed the proofrolling of a section of grid #2 on the east side of the grid. Using a loaded rubber tire vehicle the identified area was proofrolled and no visible signs of pumping or rutting were observed. Please see the attached sketch for locations.

By **Terry G. Chrisco, — Field Technician** 1800

673928

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/06/14 Tuesday
Weather / Temp: 80°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-13 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 87.90 pcf Uncorrected Opt. MC: 30.40 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 18'S, 94'W from NE corner of grid #3. Lift #2	-0.50	4.890	1.070	3.820	.0341	112.0	200.00	152.70	30.9	85.5	D4S-13	97.2	95	P

Sample: D4S-21 Description: Red Brown Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 82.10 pcf Uncorrected Opt. MC: 35.50 %

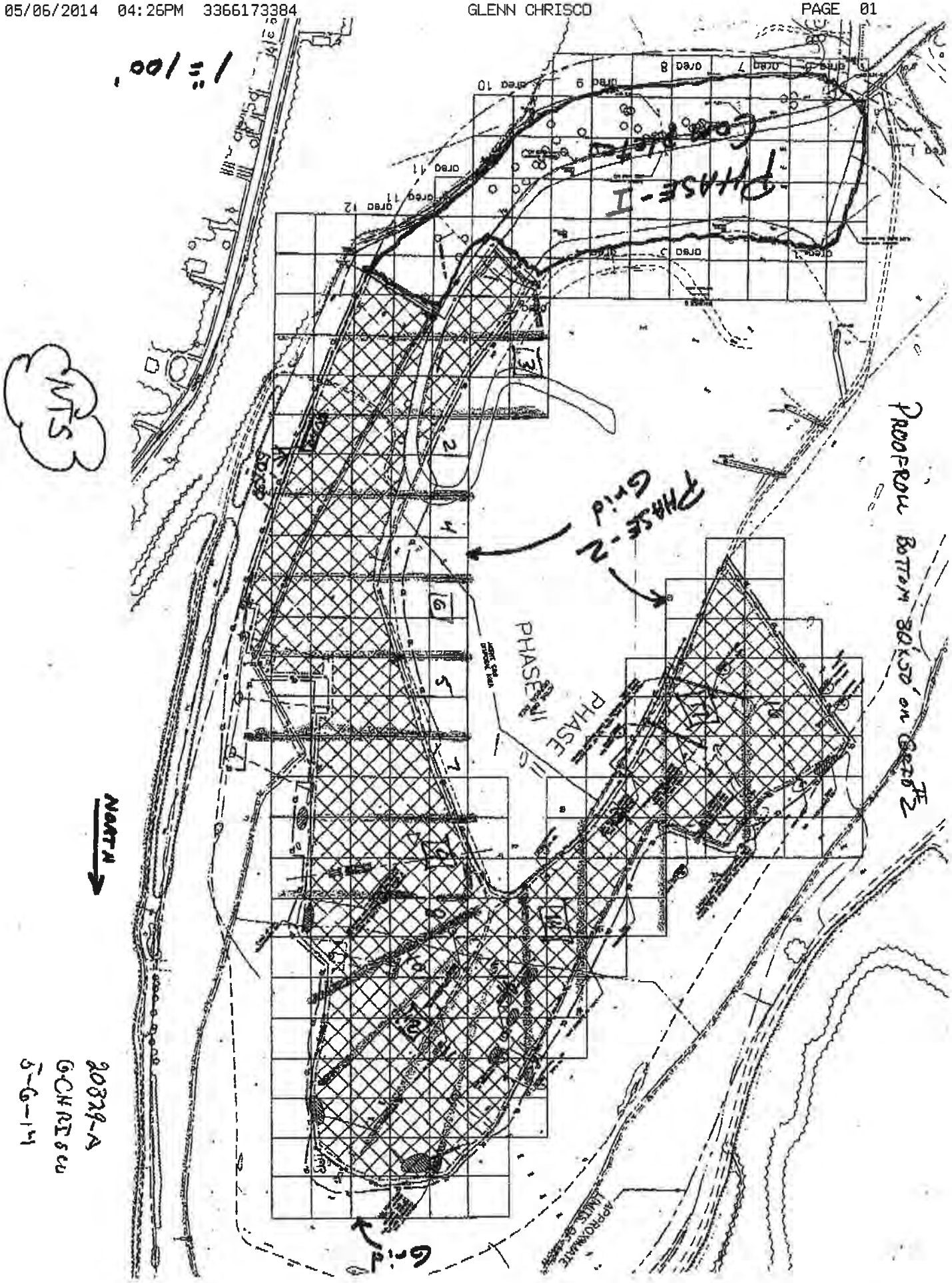
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 49'E, 131'S from NW corner of grid #2. Lift 2	-0.50	4.850	1.070	3.780	.0341	110.9	200.00	145.40	37.5	80.6	D4S-21	98.2	95	P
3	Tested 22'W, 65'N from SE corner of grid #2. Lift #2	-0.50	4.860	1.070	3.790	.0341	111.1	200.00	147.20	35.8	81.7	D4S-21	99.5	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253846



20828-A
GCHRISCO
5-6-14

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	24
Day & Date	Wednesday 05/07/2014
Weather	77°/ Sunny
On-Site Time	1.00
Lab Time	0.00
Travel Time*	0.75
Total	1.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks: Soil Denisty

Trip Charges* Tolls/Parking* Mileage* 28

Chargeable Items 1 - Basic Equipment

Time of	Arrival	Departure
	02:15P	03:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #2 and #3.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

674020

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/07/14
Weather / Temp: 77°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-2 Description: Red Brown Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.80 pcf Uncorrected Opt. MC: 29.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 40'N, 39' E from NW corner of grid #2, Lift 3.	0.00	4.980	1.070	3.910	.0341	114.7	200.00	154.50	29.4	88.6	D4S-2	99.7	95	P
2	Tested 60'W, 103'N from SE corner of grid #2. Lift #3.	0.00	4.900	1.070	3.830	.0341	112.3	200.00	154.10	29.7	86.5	D4S-2	97.4	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253922

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 9, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 25	05/08/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	25
Day & Date	Thursday 05/08/2014
Weather	88°/ Sunny
On-Site Time	2.00
Lab Time	0.00
Travel Time*	0.75
Total	2.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	03:00P	05:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #4, 3rd lift.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

674107

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/08/14 Thursday
Weather / Temp: 88°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-14 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 88.10 pcf Uncorrected Opt. MC: 29.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 75' N, 40' W from SE corner of grid #4. Lift 3.	0.00	4.980	1.070	3.910	.0341	114.7	200.00	152.90	30.8	87.6	D4S-14	99.5	95	P

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 60'S, 40'E from NW corner of grid #4. lift 3	0.00	5.060	1.070	3.990	.0341	117.0	200.00	168.60	18.6	98.6	D4S-26	95.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:253950

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 12, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 26	05/09/2014	Soil Denisty

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	26
Day & Date	Friday 05/09/2014
Weather	82°/ Sunny
On-Site Time	3.00
Lab Time	0.00
Travel Time*	0.50
Total	3.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Denisty**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	12:30P	03:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #6.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

674279

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/09/14 Friday
Weather / Temp: 82°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 46' S, 96'W from NE cor of grid #6 prior to lifts.	-1.50	5.260	1.070	4.190	.0341	122.9	200.00	165.40	20.9	101.6	D4S-26	98.2	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254104

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 13, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 27 05/12/2014 Soil Denisty

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	27
Day & Date	Monday 05/12/2014
Weather	67°/ Sunny
On-Site Time	6.75
Lab Time	0.00
Travel Time*	0.75
Total	7.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Denisty**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	09:45A	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #6.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

674729

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/12/14 Monday
Weather / Temp: 67°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-11 Description: Green Tan Fine Sandy SILT with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 93.90 pcf Uncorrected Opt. MC: 21.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 60'W, 50'N from SE corner of grid #6, Prior to fill.	-1.50	5.030	1.070	3.960	.0341	116.1	200.00	157.10	27.3	91.1	D4S-11	97.1	95	P

Sample: D4S-13 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 87.90 pcf Uncorrected Opt. MC: 30.40 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 35' S, 90'W from SW corner of grid #6, Lift #1.	-1.00	4.780	1.070	3.710	.0341	108.8	200.00	156.10	28.1	84.9	D4S-13	96.6	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254166

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/12/14 Monday
Weather / Temp: 67°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-23 Description: Red Brown Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 82.50 pcf Uncorrected Opt. MC: 33.30 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 75'W, 75'N from SW corner of grid #6. Lift #1.	-1.00	4.700	1.070	3.630	.0341	106.5	200.00	150.10	33.2	79.9	D4S-23	96.8	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254166

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 15, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 28	05/13/2014	Soil Density/Observa
Field Report # 29	05/14/2014	Soil Denisty/UC

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	28
Day & Date	Tuesday 05/13/2014
Weather	75°/ Sunny
On-Site Time	7.25
Lab Time	0.00
Travel Time*	0.50
Total	7.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks: Soil Density/Observa

Trip Charges* Tolls/Parking* Mileage* 28

Chargeable Items 1 - Basic Equipment

Time of	Arrival	Departure
	07:45A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #6 .

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

A series of undercuts were approved by Tim Williams with the White Street Landfill and were made at the northeast corner of grid #6 due to unsuitable soils. This is the first phase of a large undercut initated by the landfill personel. Please see the attached sketch for location of the following undercuts.

L26' x W13'x H4'=50.7 cubic yards
L22' xW13' xH4'=42.3 cubic yards
L24.5' x W31' x H6'=168.7 cubic yards

WET WELLS
L30' x W9'x H4'=40.0 cubic yards
L6'x W6' x H4'=5.3 cubic yards

By **Terry G. Chrisco, — Field Technician** 1800

674897

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No. **09:20329-A**
Report No. **28**
Day & Date **Tuesday 05/13/2014**

Project **White Street Landfilll Phase II Part 2**

L26' x W18' x H2.333= 39 cubic yards

By **Terry G. Chrisco, — Field Technician** 1800

674897

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/13/14 Tuesday
Weather / Temp: 75°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-13 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 87.90 pcf Uncorrected Opt. MC: 30.40 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 30'N, 125'W from SE corner of grid #6.	-5.00	4.800	1.070	3.730	.0341	109.4	200.00	157.30	27.1	86.0	D4S-13	97.8	95	P

Sample: D4S-24 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 25.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 31'S, 131'E from NW corner of grid #6 Lift 2.	-0.50	5.060	1.070	3.990	.0341	117.0	200.00	159.00	25.7	93.0	D4S-24	101.6	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254256

ECS LLP CAROLINAS
4811 Koger Blvd
Greensboro, NC 27407
Ph: 336-856-7150

CALCULATION SHEET

PROJECT: WHITE ST. PHASE II			FIGURE NO. 2
TITLE: UNDERCUT NORTH EAST SIDE OF GRID II & PHASE I			JOB NO. 20329-A
			SCALE: NTS
BY: G. CHRISCO	DATE:	APPROVED BY:	DATE: 5-13-14

L 26' x W 18' x H 2.333' = 39 CY's

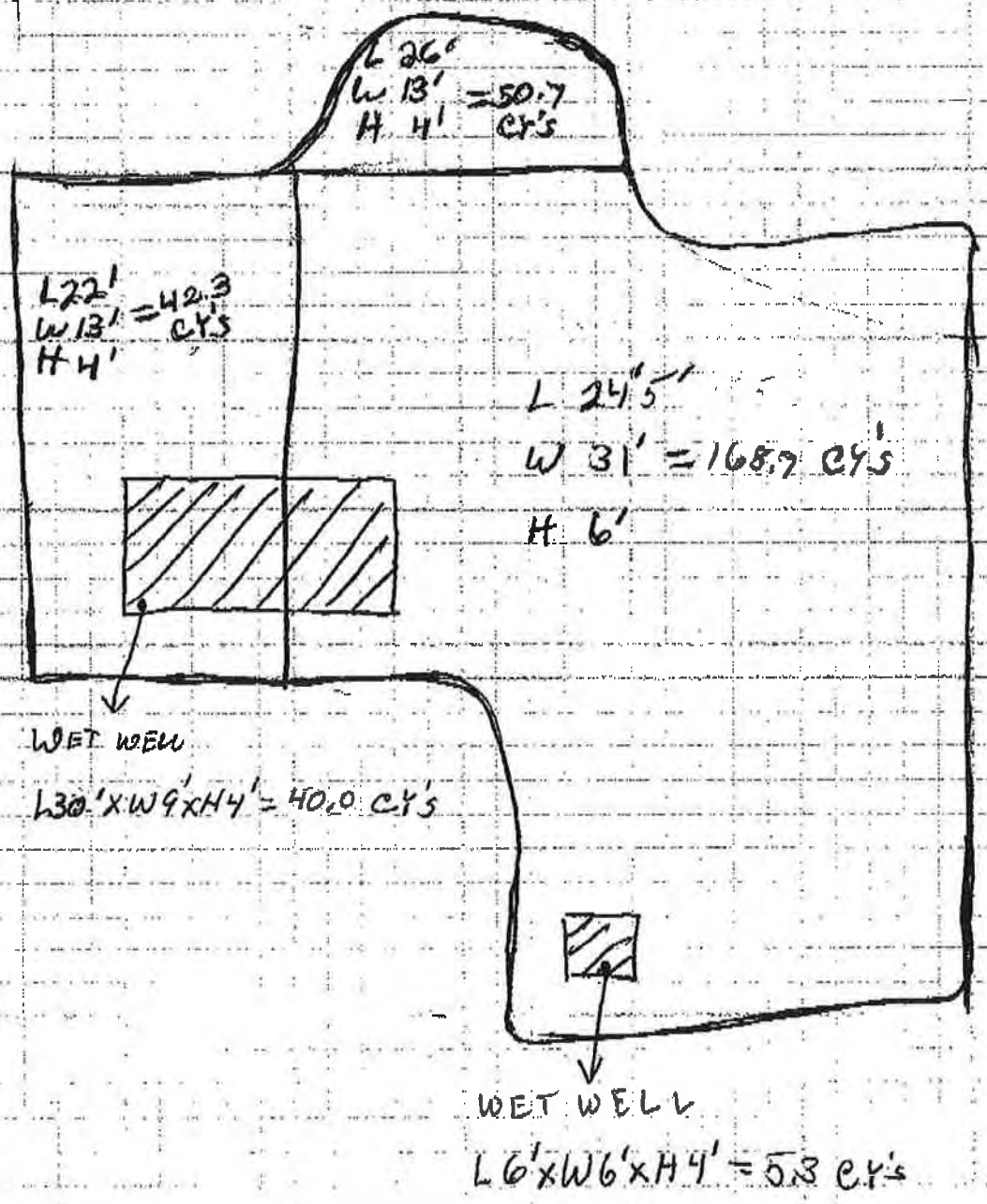
ECS LLP CAROLINAS
4811 Koger Blvd
Greensboro, NC 27407
Ph: 336-856-7150

CALCULATION SHEET

PROJECT: WHITE ST. PHASE II			FIGURE NO. 1
TITLE: UNDERCUT IN GRID II 6 PHASE I UNDERCUT			JOB NO. 20329-A
			SCALE: NTS
BY: G. CHRISCO	DATE:	APPROVED BY:	DATE: 5-13-14

TOTAL 295.3 CY'S

WET WELL TOTAL 45.3 CY'S



ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	29
Day & Date	Wednesday 05/14/2014
Weather	66°/ Sunny
On-Site Time	8.00
Lab Time	0.00
Travel Time*	0.75
Total	8.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks: Soil Denisty/UC

Trip Charges* Tolls/Parking* Mileage* 28

Chargeable Items 1 - Basic Equipment

Time of	Arrival	Departure
	08:00A	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #6 and undercut.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

A series of undercuts at the NE corner of grid #6 was performed on this date . Please see the attachment for locations and quantifications.

Area 1: 21.5' x 17' x 6'=81.2 cubic yards
Area 2: 5' x 5' x 4'=3.7 cubic yards
Area 3: 5' x 5' x 3'=2.8 cubic yards

Totaling 87.6 cubic yards

By **Terry G. Chrisco, — Field Technician** 1800

675052

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/14/14
Weather / Temp: 66°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-24 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 25.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 25'N,95'W from SE corner of grid #6	0.00	4.920	1.070	3.850	.0341	112.9	200.00	160.50	24.6	90.6	D4S-24	99.0	95	P
2	Tested 25'S,40'W from NE corner of grid #6. Prior to fill.	-1.50	4.900	1.070	3.830	.0341	112.3	200.00	149.80	33.5	84.1	D4S-24	91.9	95	F
3	Tested 15'E, 25'S from NW corner of grid #6. Lift #3.	0.00	4.850	1.070	3.780	.0341	110.9	200.00	157.40	27.0	87.2	D4S-24	95.3	95	P

*reobservation

Additional comments: Sample D4S-24 Test 2: I talked with Roger the Supervisor with Triangle, He wants to have the area proofrolled again after the undercut. If the proofroll passes then he will ignore the test and go with the proofroll.

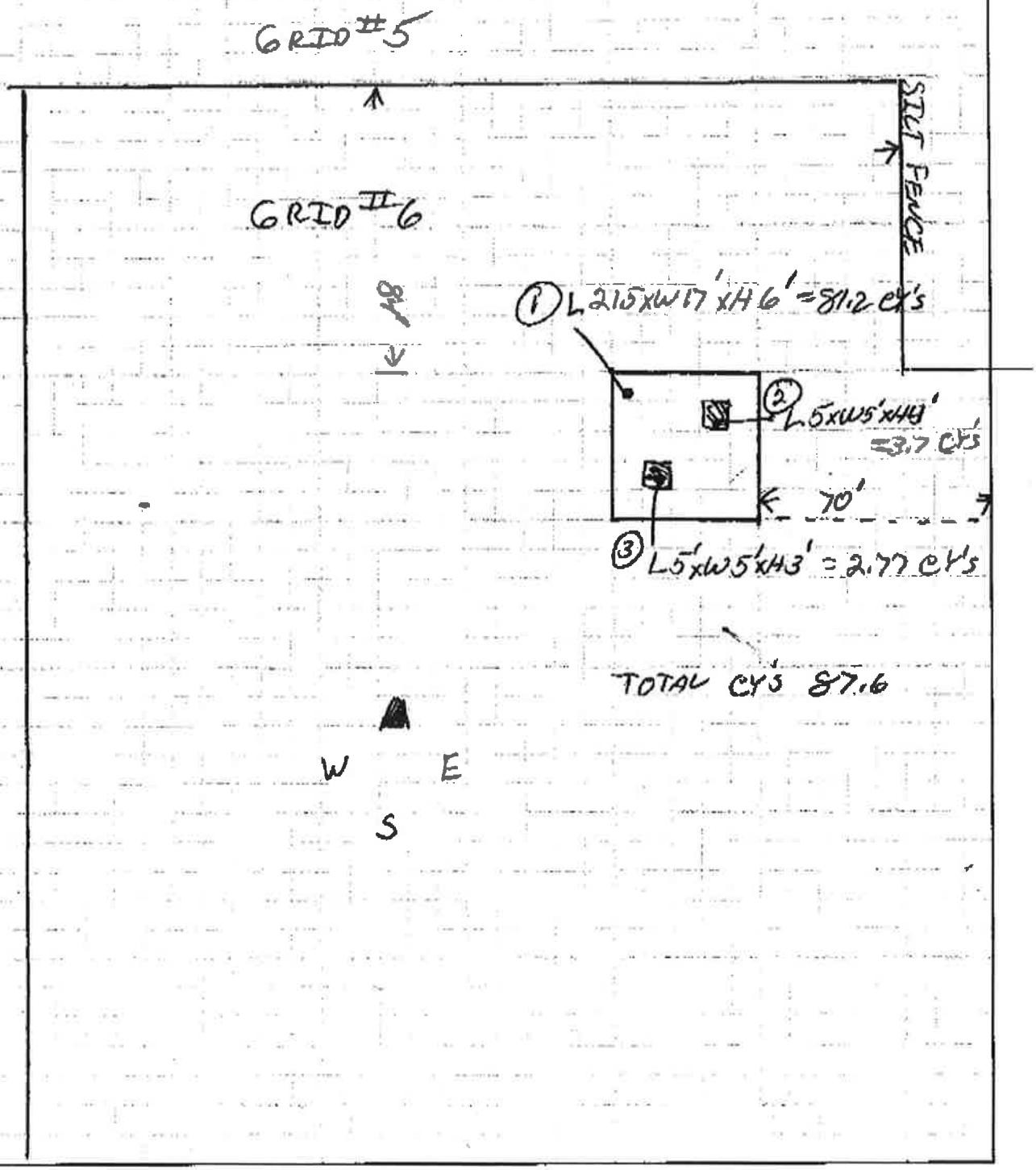
Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254276

ECS LLP
CAROLINAS
4811 Koger Blvd
Greensboro, NC 27407
Ph: 336-856-7150

CALCULATION SHEET

PROJECT: WHITE ST. – PHASE II			FIGURE NO. 1
TITLE: UNDERCUTS ON GRID #6			JOB NO. 20329-A
			SCALE: NTS
BY: G. CHRISCO	DATE:	APPROVED BY:	DATE: 5-14-14



ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

May 22, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 30	05/20/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	30
Day & Date	Tuesday 05/20/2014
Weather	78°/ Sunny
On-Site Time	1.00
Lab Time	0.00
Travel Time*	0.50
Total	1.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	02:45P	03:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #6.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

675961

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/20/14 Tuesday
Weather / Temp: 78°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-21 Description: Red Brown Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 82.10 pcf Uncorrected Opt. MC: 35.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 50'N, 45'W from SE corner of grid #6. Lift #3.	0.00	4.790	1.070	3.720	.0341	109.1	200.00	150.50	32.8	82.0	D4S-21	99.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254549

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 1, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 31 05/29/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	31
Day & Date	Thursday 05/29/2014
Weather	74
On-Site Time	8.50
Lab Time	0.00
Travel Time*	0.75
Total	9.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks	Soil Density					
Trip Charges*		Tolls/Parking*		Mileage*	28	Time of Arrival 07:45A Departure 04:15P
Chargeable Items	1 - Basic Equipment					

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on-site, as requested, to observe the proofrolling of grid #5, prior to backfill placement. Please see the attached sketch.

Using a loaded rubber tire vehicle the identified area was proofrolled and no visible signs of pumping or rutting were observed.

The undersigned also observed the placement and compaction of soils for test strip on grid #5. Please see the attached sketch.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/29/14 Thursday
Weather / Temp: 74

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 28'S, 9'E from NW corner of test strip in grid #5 . Prior to fill.	-1.50	5.080	1.070	4.010	.0341	117.6	200.00	178.30	12.1	104.8	D4S-17	99.7	95	P
2	Tested 61'S, 20'E from NW corner of test strip in grid #5, Prior to fill.	-1.50	5.000	1.070	3.930	.0341	115.3	200.00	176.10	13.5	101.5	D4S-17	96.5	95	P
3	Tested 5'N, 5'E from SW corner of test strip in grid #5, Prior to fill	-1.50	4.920	1.070	3.850	.0341	112.9	200.00	177.10	12.9	99.9	D4S-17	95.1	95	P

*reobservation

Additional comments: Sample D4S-6 Test 6: Retest of #4 ------ Sample D4S-6 Test 7:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254987

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/29/14 Thursday
Weather / Temp: 74

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 9'N,8'E from SW corner of grid #5 test strip.1st lift.	-1.00	5.170	1.070	4.100	.0341	120.2	200.00	171.60	16.5	103.1	D4S-6	92.3	95	F
5	Tested 9'N,8'E from SW corner of grid #5 test strip.1st lift.	-1.00	5.220	1.070	4.150	.0341	121.7	200.00	171.80	16.4	104.5	D4S-6	93.5	95	F
6	Tested 9'N,8'E from SW corner of grid #5 test strip.1st lift.	-1.00	5.280	1.070	4.210	.0341	123.5	200.00	175.40	14.0	108.3	D4S-6	96.9	95	P
7	Tested 25'S, 6'E from NW corner of test strip 1st lift.	-1.00	5.200	1.070	4.130	.0341	121.1	200.00	176.70	13.1	106.9	D4S-6	95.7	95	P
8	Tested 5'S, 6'E from NW corner of test strip. 1st lift.	-1.00	5.400	1.070	4.330	.0341	127.0	200.00	170.90	17.0	108.5	D4S-6	97.1	95	P
9	Tested 21'N 8'E from SW corner of	-1.00	5.220	1.070	4.150	.0341	121.7	200.00	177.40	12.7	107.9	D4S-6	96.6	95	P

*reobservation

Additional comments: Sample D4S-6 Test 6: Retest of #4 ------ Sample D4S-6 Test 7:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254987

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/29/14 Thursday
Weather / Temp: 74

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

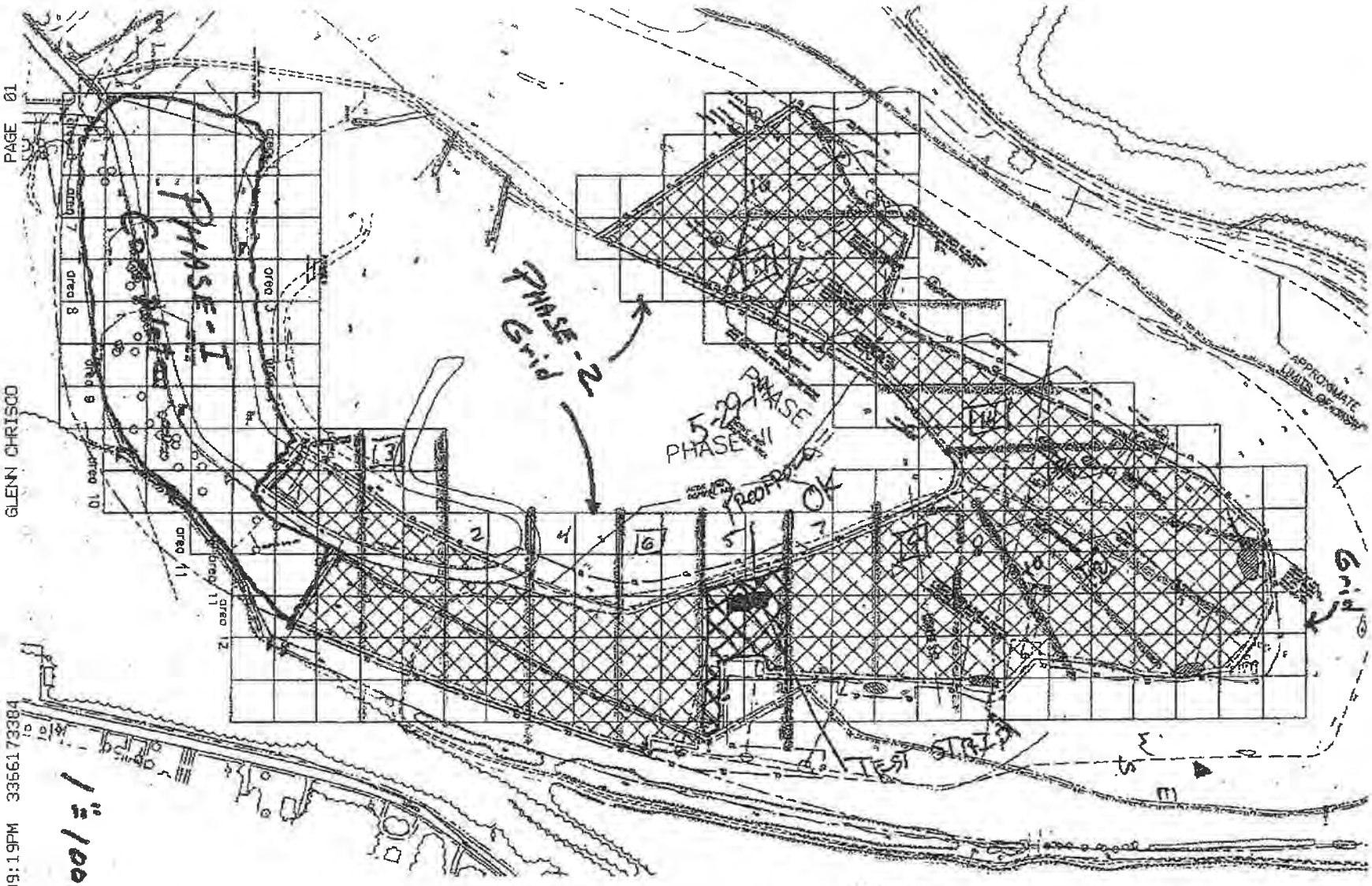
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
	grid #5. Test strip.														

*reobservation

Additional comments: Sample D4S-6 Test 6: Retest of #4 ------ Sample D4S-6 Test 7:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:254987


PHASE-I
Grid
PHASE-2
Grid
5-29-14
PHASE
PHASE II
PROPOSED
OK
APPROXIMATE LIMITS OF DISPOSAL
1" = 100'
NORTH
G.CHRISE
NOT TO SCALE
20829-A
5-29-14

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 3, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 32	05/30/2014	Soil Density/Observa

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	32
Day & Date	Friday 05/30/2014
Weather	71°/ Cloudy
On-Site Time	8.50
Lab Time	0.00
Travel Time*	0.75
Total	9.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks	Soil Density/Observa					
Trip Charges*		Tolls/Parking*		Mileage*	28	Time of Arrival 08:00A Departure 04:30P
Chargeable Items	1 - Basic Equipment					

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #5.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

While onsite the undersigned arrived on-site, as requested, to observe the proofrolling of Grid #7. Please see the attached sketch. Using a large smoothdrum roller, the identified area was proofrolled and no visible signs of pumping or rutting were observed.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/30/14 Friday
Weather / Temp: 71°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

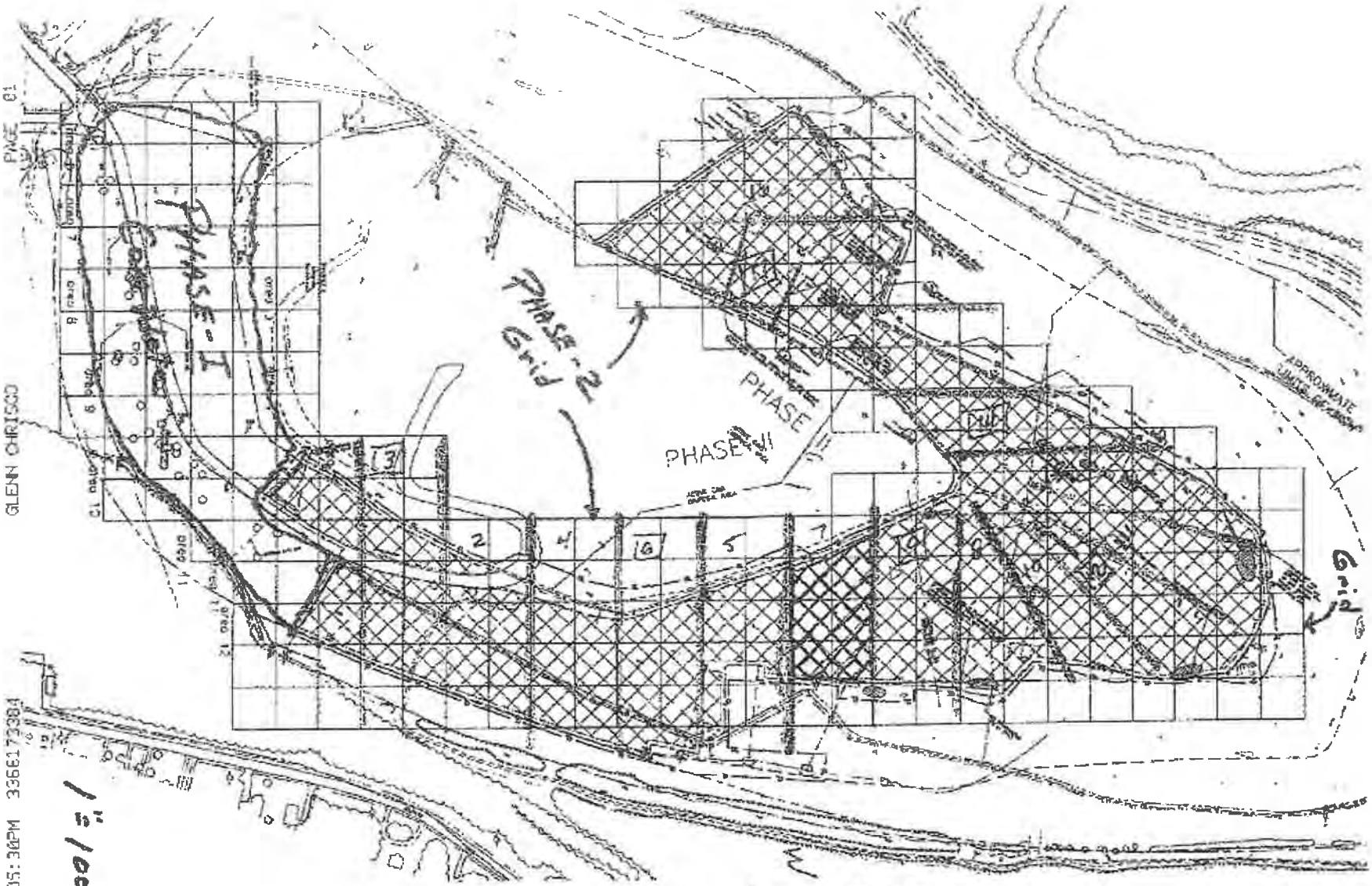
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 40'S, 10'E from NW corner of test strip in grid #5.	0.50	5.330	1.070	4.260	.0341	124.9	200.00	170.50	17.3	106.4	D4S-6	95.3	95	P
2	Tested 9'S, 8'E from NW cor ner of test strip in grid #5.	1.00	5.470	1.070	4.400	.0341	129.0	200.00	173.00	15.6	111.5	D4S-6	99.8	95	P
3	Tested 10'S, 8'E from NW corner of test strip in grid #5. lift 3	0.00	5.360	1.070	4.290	.0341	125.8	200.00	173.90	15.0	109.3	D4S-6	97.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255038



NTS

PROOFROLLED 5-20-14

20329-A
5-30-14
GRID #7
G. CHRISCO

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 2, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:
Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 33	05/31/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	33
Day & Date	Saturday 05/31/2014
Weather	67°/ Sunny
On-Site Time	4.50
Lab Time	0.00
Travel Time*	0.75
Total	5.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	12:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for the test strip at grid #5.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

677424

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 05/31/14 Saturday
Weather / Temp: 67°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 50'N, 5'E from SW corner of test strip on #5 grid 3rd lift.	0.00	5.390	1.070	4.320	.0341	126.7	200.00	172.80	15.7	109.4	D4S-6	98.0	95	P
2	Tested 70'S, 55'W from NE corner of test strip on grid #5. Lift 1.	-1.00	5.360	1.070	4.290	.0341	125.8	200.00	175.20	14.1	110.2	D4S-6	98.6	95	P
3	Tested 7'E, 9'N from SW corner of test strip on grid #5. lift #3.	0.00	5.300	1.070	4.230	.0341	124.1	200.00	173.50	15.2	107.6	D4S-6	96.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255105

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 3, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 34 06/02/2014 Soil Density/SPU

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	34
Day & Date	Monday 06/02/2014
Weather	75°/ Sunny
On-Site Time	7.00
Lab Time	0.25
Travel Time*	0.75
Total	8.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/SPU**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	08:00A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #5 and grid #7.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Also while onsite a permeability sample (tubes pushed in with the dozer on site) was obtained on this date at Grid #5 in the test strip within 2 feet of the last compaction test. The test was located at 7'E, 9'N from SW corner of the test strip.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/02/14 Monday
Weather / Temp: 75°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 77'N, 85'E form SW corner of grid #5 lift #3	0.00	5.420	1.060	4.360	.0339	128.6	200.00	178.70	11.9	114.9	D4S-3	99.4	95	P
3	Tested 42'N, 29'E from SW corner of grid #7 prior to backfill	-1.50	5.220	1.060	4.160	.0339	122.7	200.00	179.70	11.2	110.2	D4S-3	95.4	95	P
4	Tested 46' S, 122'W from NE corner of grid #7 prior to backfill	-1.50	5.200	1.060	4.140	.0339	122.1	200.00	18.000	***.*	10.9	D4S-3	9.5	95	P

*reobservation

Additional comments: Sample D4S-3 Test 2: This completes grid #5.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255171

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/02/14 Monday
Weather / Temp: 75°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	20'S, 45'W from NE corner of grid #5, lift #2.	-0.50	5.350	1.060	4.290	.0339	126.6	200.00	171.20	16.8	108.3	D4S-6	97.0	95	P

*reobservation

Additional comments: Sample D4S-3 Test 2: This completes grid #5.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255171

ECS Carolinas, LLP
4811 Koger Boulevard
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(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 4, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 35	06/03/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	35
Day & Date	Tuesday 06/03/2014
Weather	60°/ Sunny
On-Site Time	4.25
Lab Time	0.00
Travel Time*	0.75
Total	5.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	12:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #7 prior to lifts.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

677621

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/03/14 Tuesday
Weather / Temp: 60°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 35'N, 30'W from SE corner of grid #7, prior to lift	-1.50	4.990	1.060	3.930	.0339	115.9	200.00	176.70	13.1	102.3	D4S-17	97.4	95	P

Sample: D4S-19 Description: Tan Brown Silty Fine to Medium SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.40 pcf Uncorrected Opt. MC: 14.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 38'S, 41'E from NW corner of grid #7, prior to lift	-1.50	5.080	1.060	4.020	.0339	118.6	200.00	177.60	12.6	105.3	D4S-19	94.5	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255261

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4811 Koger Boulevard
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(336) 856-7150 [Phone]
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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 7, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 36	06/04/2014	Soil Density
Field Report # 37	06/05/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	36
Day & Date	Wednesday 06/04/2014
Weather	66°/ Sunny
On-Site Time	6.00
Lab Time	0.00
Travel Time*	0.75
Total	6.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	02:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #5.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Note: At approximately 8:53 AM Roger with Triangle Paving and Grading informed the technician that another trackhoe was being sent to the project due to the computer malfunctioned on the trackhoe onsite. The operator was using a front end loader to load the trucks which has has slowed delivery of soil down to the project.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/04/14
Weather / Temp: 66°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 11'S, 7'W from NE cor of grid #5	0.00	5.170	1.070	4.100	.0339	120.9	200.00	179.40	11.4	108.4	D4S-6	97.0	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255289

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
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FIELD REPORT

Project No.	09:20329-A
Report No.	37
Day & Date	Thursday 06/05/2014
Weather	71°/ Cloudy
On-Site Time	8.25
Lab Time	0.00
Travel Time*	0.75
Total	9.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #7.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard proctor method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

677745

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/05/14 Thursday
Weather / Temp: 71°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-24 Description: Red Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 91.50 pcf Uncorrected Opt. MC: 25.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 60'S, 115'E from NW corner of grid #7. 1st lift	-1.00	4.580	1.060	3.520	.0339	103.8	200.00	166.60	20.0	86.4	D4S-24	94.4	95	F
3	Tested 60'S, 115'E from NW corner of grid #7. 1st lift	-1.00	4.850	1.060	3.790	.0339	111.8	200.00	160.00	25.0	89.4	D4S-24	97.7	95	P

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 26'N, 51'W from SE corner of grid #7. 1st lift	-1.00	4.910	1.060	3.850	.0339	113.6	200.00	173.30	15.4	98.4	D4S-26	95.1	95	P

*reobservation

Additional comments: Sample D4S-24 Test 2: Rolled area more. ------ Sample D4S-26 Test 4: Retest of test 2

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255363

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfill Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/05/14 Thursday
Weather / Temp: 71°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 52'N,16'E from SW corner of grid #7. 1st lift	-1.00	5.450	1.060	4.390	.0339	129.5	200.00	177.50	12.6	114.9	D4S-3	99.5	95	P

*reobservation

Additional comments: Sample D4S-24 Test 2: Rolled area more. ------ Sample D4S-26 Test 4: Retest of test 2

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255363

ECS Carolinas, LLP
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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 9, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 38	06/06/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
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FIELD REPORT

Project No.	09:20329-A
Report No.	38
Day & Date	Friday 06/06/2014
Weather	67°/ Cloudy
On-Site Time	8.50
Lab Time	0.00
Travel Time*	0.75
Total	9.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #7.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

677820

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/06/14 Friday
Weather / Temp: 67°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 140'S, 71'W from NE corner of grid #7. 1st lift.	-1.00	5.060	1.060	4.000	.0339	118.0	200.00	174.00	14.9	102.6	D4S-17	97.6	95	P

Sample: D4S-5 Description: Tan brown fine - medium silt with clay. Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 97.70 pcf Uncorrected Opt. MC: 21.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 106'S, 130'E from NW corner of grid #7. 1st lift.	-1.00	5.000	1.060	3.940	.0339	116.2	200.00	166.80	19.9	96.9	D4S-5	99.1	95	P
4	Tested 15'E,24'N from SW corner of grid #7 lift 2.	-0.50	4.920	1.060	3.860	.0339	113.9	200.00	165.50	20.8	94.2	D4S-5	96.4	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255364

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/06/14 Friday
Weather / Temp: 67°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 40'S, 100'W from NE corner of grid #7. 1st lift.	-1.00	5.320	1.060	4.260	.0339	125.7	200.00	169.10	18.2	106.2	D4S-6	95.1	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255364

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 9, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 39	06/09/2014	Soil/Density/PR

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	39
Day & Date	Monday 06/09/2014
Weather	63°/ Sunny
On-Site Time	5.50
Lab Time	0.00
Travel Time*	0.75
Total	6.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil/Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:00A	12:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 7 and 9.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

While onsite the undersigned also observed the grid 9. Please see the attached sketch. Using a loaded rubber tire vehicle, the identified area was proofrolled and no visible signs of pumping or rutting were observed.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/09/14 Monday
Weather / Temp: 63°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 18'W, 89'S from NE corner of grid #7, lift #2.	-0.50	5.020	1.060	3.960	.0339	116.8	200.00	171.40	16.6	100.0	D4S-17	95.2	95	P
3	Tested 64'W, 85'N from SE corner of grid # 9	-1.50	4.770	1.060	3.710	.0339	109.4	200.00	179.70	11.2	98.2	D4S-17	93.5	95	P
5	Tested 40'E, 20'S from NW corner of grid #9	-1.50	4.790	1.060	3.730	.0339	110.0	200.00	181.60	10.1	99.8	D4S-17	95.0	95	P

*reobservation

Additional comments: Sample D4S-17 Test 3: This test was prior to soil lifts being placed. Passed proofroll ------ Sample D4S-17 Test 5: Prior to soil lifts being placed. ------ Sample D4S-6 Test 4: Prior to soil lifts being placed.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255507

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/09/14 Monday
Weather / Temp: 63°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

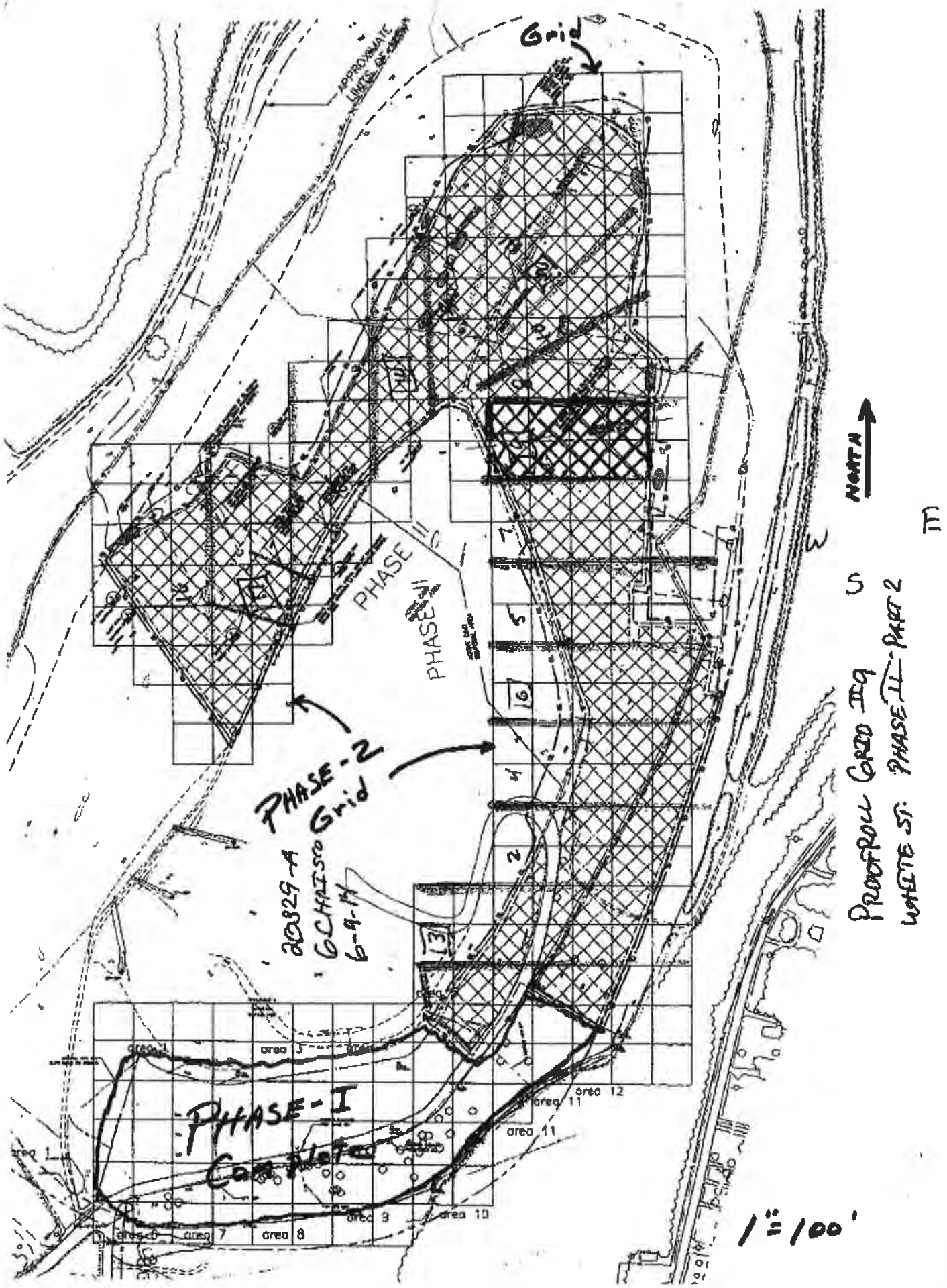
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 94'E, 95' S from NW corner of grid #7, lift #2.	-0.50	5.240	1.060	4.180	.0339	123.3	200.00	175.80	13.7	108.3	D4S-6	97.0	95	P
4	Tested 115'W, 54'S from NE corner of grid #9	-1.50	5.480	1.060	4.420	.0339	130.4	200.00	169.40	18.0	110.4	D4S-6	98.8	95	P

*reobservation

Additional comments: Sample D4S-17 Test 3: This test was prior to soil lifts being placed. Passed proofroll ------ Sample D4S-17 Test 5: Prior to soil lifts being placed. ------ Sample D4S-6 Test 4: Prior to soil lifts being placed.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255507


Grid
APPROXIMATE LIMITS OF SEEP
PHASE
PHASE
PHASE-2 Grid
20329-A
G.CHRISCO
6-9-14
PHASE-I Completed
area 1
area 5
area 7
area 8
area 9
area 10
area 11
area 12
NORTH
S
E
W
1" = 100'
PROFILE GRID IIa
WHITE ST. PHASE II - PART 2

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 10, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 40	06/10/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	40
Day & Date	Tuesday 06/10/2014
Weather	69°/ Sunny
On-Site Time	5.75
Lab Time	0.00
Travel Time*	0.75
Total	6.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of Arrival **07:45A** Departure **01:30P**

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #7.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

678269

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/10/14 Tuesday
Weather / Temp: 69°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 83'E, 75'N from SW cor of grid #7. lift #3.	0.00	5.300	1.090	4.210	.0341	123.4	200.00	178.80	11.8	110.3	D4S-6	98.7	95	P
2	Tested 30'N, 60'W from SW cor of grid #7. lift #3.	0.00	5.170	1.090	4.080	.0341	119.7	200.00	181.00	10.4	108.3	D4S-6	96.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255622

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 11, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 41 06/11/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	41
Day & Date	Wednesday 06/11/2014
Weather	70°/ Sunny
On-Site Time	7.00
Lab Time	0.00
Travel Time*	0.75
Total	7.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #7 and #9.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

678352

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/11/14
Weather / Temp: 70°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 38'S, 32'E from NW corner of grid #7. lift #3.	0.00	5.270	1.090	4.180	.0341	122.6	200.00	178.10	12.2	109.1	D4S-6	97.7	95	P

Sample: D4S-7 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 125.10 pcf Uncorrected Opt. MC: 11.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 130'W, 47'S from NE corner of grid #7. Lift #3.	0.00	5.620	1.090	4.530	.0341	132.8	200.00	181.50	10.1	120.5	D4S-7	96.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255661

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/11/14
Weather / Temp: 70°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-9 Description: White Tan Brown Fine Silty SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 114.60 pcf Uncorrected Opt. MC: 12.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 67'N, 48'E from SW corner of grid #9. lift #1	-1.00	5.430	1.090	4.340	.0341	127.3	200.00	180.00	11.1	114.5	D4S-9	99.9	95	P
2	Tested 58'E, 30'S from NW corner of grid #9 lift #1.	-1.50	5.460	1.090	4.370	.0341	128.2	200.00	177.80	12.4	113.9	D4S-9	99.4	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255661

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 13, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 42	06/12/2014	Soil Denisty

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	42
Day & Date	Thursday 06/12/2014
Weather	76°/ Cloudy
On-Site Time	4.00
Lab Time	0.00
Travel Time*	1.50
Total	5.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Denisty**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	08:00A	09:45A
	01:45P	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #9.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

The rain overnight left grid #9 muddy, when the technician arrived on site the contractor had already started pushing the mud off of the grid and replacing with a drier soils.

By **Terry G. Chrisco, — Field Technician** 1800

678430

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/12/14 Thursday
Weather / Temp: 76°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3A-1 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 219'E, 10'N from SW cor of grid #9. lift #1.	-1.00	5.310	1.060	4.250	.0341	124.6	200.00	180.90	10.5	112.7	D4S-3	97.5	95	P

Sample: D4S-7 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Virginia Test Method (VTM-1) Uncorrected Max. Density: 125.10 pcf Uncorrected Opt. MC: 11.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 20'S, 123'E from NW cor of grid 9. Lift #2.	0.50	5.540	1.090	4.450	.0341	130.5	200.00	184.30	8.5	120.2	D4S-7	96.1	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255710

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 14, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 43 06/13/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	43
Day & Date	Friday 06/13/2014
Weather	81°/ Cloudy
On-Site Time	4.75
Lab Time	0.00
Travel Time*	1.50
Total	6.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Reports - Additional Copies**

Times of	Arrival	Departure
	08:30A	09:15A
	01:00P	05:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 9, 8, 10.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698 for test 1 and 2. Test 3 and 4 did not meet the project requirements of 95%, the areas will be retested at a later date.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

678611

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/13/14 Friday
Weather / Temp: 81°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 27'N, 78' E from SW corner of grid #8. prior to lift.	-1.50	4.710	1.060	3.650	.0339	107.7	200.00	175.90	13.7	94.7	D4S-26	91.6	95	F
4	Tested 23'S, 131'E from NW corner of grid 10, prior to backfill.	-1.50	4.780	1.060	3.720	.0339	109.7	200.00	179.60	11.3	98.5	D4S-26	95.2	95	F

Sample: D4S-9 Description: White Tan Brown Fine Silty SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 114.60 pcf Uncorrected Opt. MC: 12.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 40'W, 21'S from NE corner of grid 9. lift 1	-1.50	5.380	1.060	4.320	.0339	127.4	200.00	179.60	11.3	114.4	D4S-9	99.8	95	P

*reobservation

Additional comments: Sample D4S-26 Test 4: Moisture is low on this test.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255711

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/13/14 Friday
Weather / Temp: 81°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-9 Description: White Tan Brown Fine Silty SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 114.60 pcf Uncorrected Opt. MC: 12.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 70'N, 40'W from SE corner of grid #9, lift 2	-0.50	5.350	1.060	4.290	.0339	126.6	200.00	179.30	11.5	113.4	D4S-9	99.0	95	P

*reobservation

Additional comments: Sample D4S-26 Test 4: Moisture is low on this test.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255711

ECS Carolinas, LLP
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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 16, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 44	06/14/2014	Cancellation

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	44
Day & Date	Saturday 06/14/2014
Weather	59°/ Sunny
On-Site Time	0.50
Lab Time	0.00
Travel Time*	0.75
Total	1.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Cancellation**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:45A	08:15A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe The placement of soils on grids 9, 8, 10. After waiting for the foreman to show up the technician contacted Roger and he stated that he could not get be able to get trucks to haul the soils today and that they would not be placing soil. ECS was not notified today that they would not be working.

By **Terry G. Chrisco, — Field Technician** 1800

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 17, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 45 06/16/2014 Soil Density/PR

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	45
Day & Date	Monday 06/16/2014
Weather	80°/ Sunny
On-Site Time	8.25
Lab Time	0.00
Travel Time*	0.75
Total	9.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	08:00A	04:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 8 and 10.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Note: Test #3 has compaction result was 93%. This area is prior to fill placement on grid #10. The area will be proofrolled and if the area passes a proofroll the compaction test will be voided.

While onsite the undersigned observed the proofrolling of grids 8 and 10.

Using a loaded rubber tire vehicle. The identified area was proofrolled and no visible signs of pumping or rutting were observed.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/16/14 Monday
Weather / Temp: 80°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-1 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 96.00 pcf Uncorrected Opt. MC: 23.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 57'S, 273'W from NE corner of grid #10 prior to 1st lift.	-1.50	4.660	1.060	3.600	.0339	106.2	200.00	168.30	18.8	89.3	D4S-1	93.0	95	F

Sample: D4S-19 Description: Tan Brown Silty Fine to Medium SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.40 pcf Uncorrected Opt. MC: 14.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 28'S,20'W from NE corner of grid #10 prior to 1st lift.	-1.50	5.080	1.060	4.020	.0339	118.6	200.00	179.20	11.6	106.2	D4S-19	95.3	95	P

*reobservation

Additional comments: Sample D4S-1 Test 3: prior to first lift

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255912

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/16/14 Monday
Weather / Temp: 80°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 76'W 90'N, SE corner of grid #8 prior to lifts	-1.50	5.130	1.060	4.070	.0339	120.1	200.00	183.30	9.1	110.0	D4S-3	95.3	95	P

Sample: D4S-5 Description: Red Fine Sandy SILT Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 94.70 pcf Uncorrected Opt. MC: 20.40 %

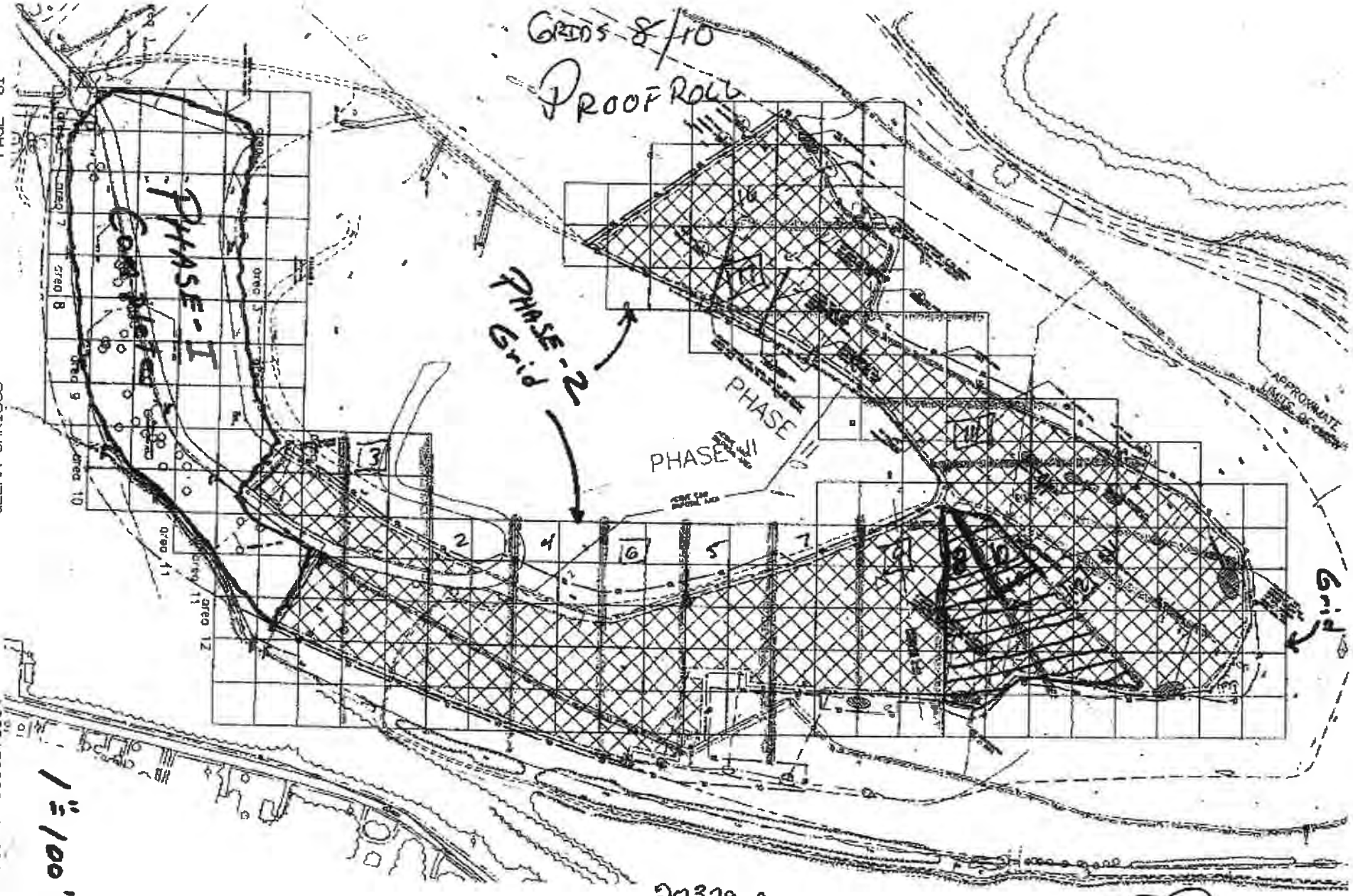
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 141'W, 4'S from NE corner of grid #8 prior to 1st lift	-1.50	4.890	1.060	3.830	.0339	113.0	200.00	166.00	20.4	93.7	D4S-5	99.0	95	P

*reobservation

Additional comments: Sample D4S-1 Test 3: prior to first lift

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255912



20329-A
6-16-14
PROOFROLL
GRIDS #8 & #10

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 18, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 46	06/17/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	46
Day & Date	Tuesday 06/17/2014
Weather	71°/ Sunny
On-Site Time	8.50
Lab Time	0.00
Travel Time*	0.75
Total	9.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	08:00A	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #9.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

679161

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/17/14 Tuesday
Weather / Temp: 71°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 135'W,18'N from SE corner of grid #9, lift #3.	0.00	5.310	1.060	4.250	.0339	125.4	200.00	167.50	19.4	105.0	D4S-17	99.9	95	P
2	Tested 28'S, 33'E from NW corner of grid #9, 3rd lift.	0.00	5.000	1.060	3.940	.0339	116.2	200.00	175.30	14.0	101.8	D4S-17	96.9	95	P

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 80'N, 22'E from SW corner of grid #9, lift #3.	0.00	5.300	1.060	4.240	.0339	125.1	200.00	178.60	11.9	111.7	D4S-6	100.0	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:255984

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 20, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:
Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 47	06/18/2014	Soil Density
Field Report # 48	06/19/2014	Soil Density

Ronald R. Newman, CWI
Corporate NDT Level III

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	47
Day & Date	Wednesday 06/18/2014
Weather	89°/ Sunny
On-Site Time	3.75
Lab Time	0.00
Travel Time*	0.75
Total	4.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	12:45P	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #9.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/18/14
Weather / Temp: 89°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 27'S, 60'E from NW corner of grid #9. lift #3	0.00	5.290	1.060	4.230	.0339	124.8	200.00	182.00	9.8	113.5	D4S-3	98.3	95	P

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 36'S, 100'W from NE corner of grid #9' lift #3.	0.00	5.030	1.060	3.970	.0339	117.1	200.00	181.10	10.4	106.0	D4S-6	94.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256011

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	48
Day & Date	Thursday 06/19/2014
Weather	91°/ Sunny
On-Site Time	1.25
Lab Time	0.00
Travel Time*	0.75
Total	2.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	02:15P	03:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #10.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad, misaligned utilities or stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

679514

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/19/14 Thursday
Weather / Temp: 91°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-27 Description: Tan brown fine - medium sandy silt with clay Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 97.70 pcf Uncorrected Opt. MC: 21.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 330' E, 21'S from NW corner of grid #10. lift 1.	-1.00	4.980	1.060	3.920	.0339	115.6	200.00	168.30	18.8	97.2	D4S-27	99.5	95	P

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 28' E, 44'S form NW corner of grid #10, lift #2.	-0.50	5.060	1.060	4.000	.0339	118.0	200.00	181.50	10.1	107.0	D4S-6	95.8	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256012

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 20, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:
Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 49	06/20/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	49
Day & Date	Friday 06/20/2014
Weather	69°/ Sunny
On-Site Time	1.50
Lab Time	0.00
Travel Time*	0.75
Total	2.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:00A	08:30A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #8.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/20/14 Friday
Weather / Temp: 69°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 27' S, 202' W from SW corner of grid #8, lift #1.	-1.00	5.280	1.060	4.220	.0339	124.5	200.00	176.30	13.4	109.7	D4S-6	98.2	95	P
2	Tested 177'E, 75' S from NW cor of grid #8. lift #2.	-0.50	5.200	1.060	4.140	.0339	122.1	200.00	180.70	10.6	110.3	D4S-6	98.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256013

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 24, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:
Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 50	06/23/2014	Soil Density/PR

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

This report (and any included attachments) shall not be reproduced, except in full, without the prior written approval of ECS.

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	50
Day & Date	Monday 06/23/2014
Weather	68°/ Cloudy
On-Site Time	5.00
Lab Time	0.00
Travel Time*	1.00
Total	6.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	09:30A	02:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 8, 10 and 12.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for structures located off of the observed engineered pad or stakeout errors causing uncontrolled fill to be placed in structural areas.

The undersigned also observed the proofrolling of Grid #12 prior to backfill Please see the attached sketch. Using a loaded rubber tire vehicle, the identified area was proofrolled and no visible signs of pumping or rutting were observed.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/23/14 Monday
Weather / Temp: 68°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 60'W, 10'N from SE cor of grid #12, prior to lifts.	-1.50	5.030	1.060	3.970	.0339	117.1	200.00	167.60	19.3	98.1	D4S-26	94.9	95	P

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 60' N, 140' E from SW cor of grid #8' lift #3.	0.00	5.440	1.060	4.380	.0339	129.2	200.00	178.20	12.2	115.1	D4S-3	99.6	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256276

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/23/14 Monday
Weather / Temp: 68°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-5 Description: Red Fine Sandy SILT Proctor Method: ASTM D 698-07 Method A Standard Uncorrected Max. Density: 94.70 pcf Uncorrected Opt. MC: 20.40 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 18'N, 60' E from SW cor of grid #12, prior to lifts.	-1.50	4.730	1.060	3.670	.0339	108.3	200.00	170.00	17.6	92.0	D4S-5	97.2	95	P

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

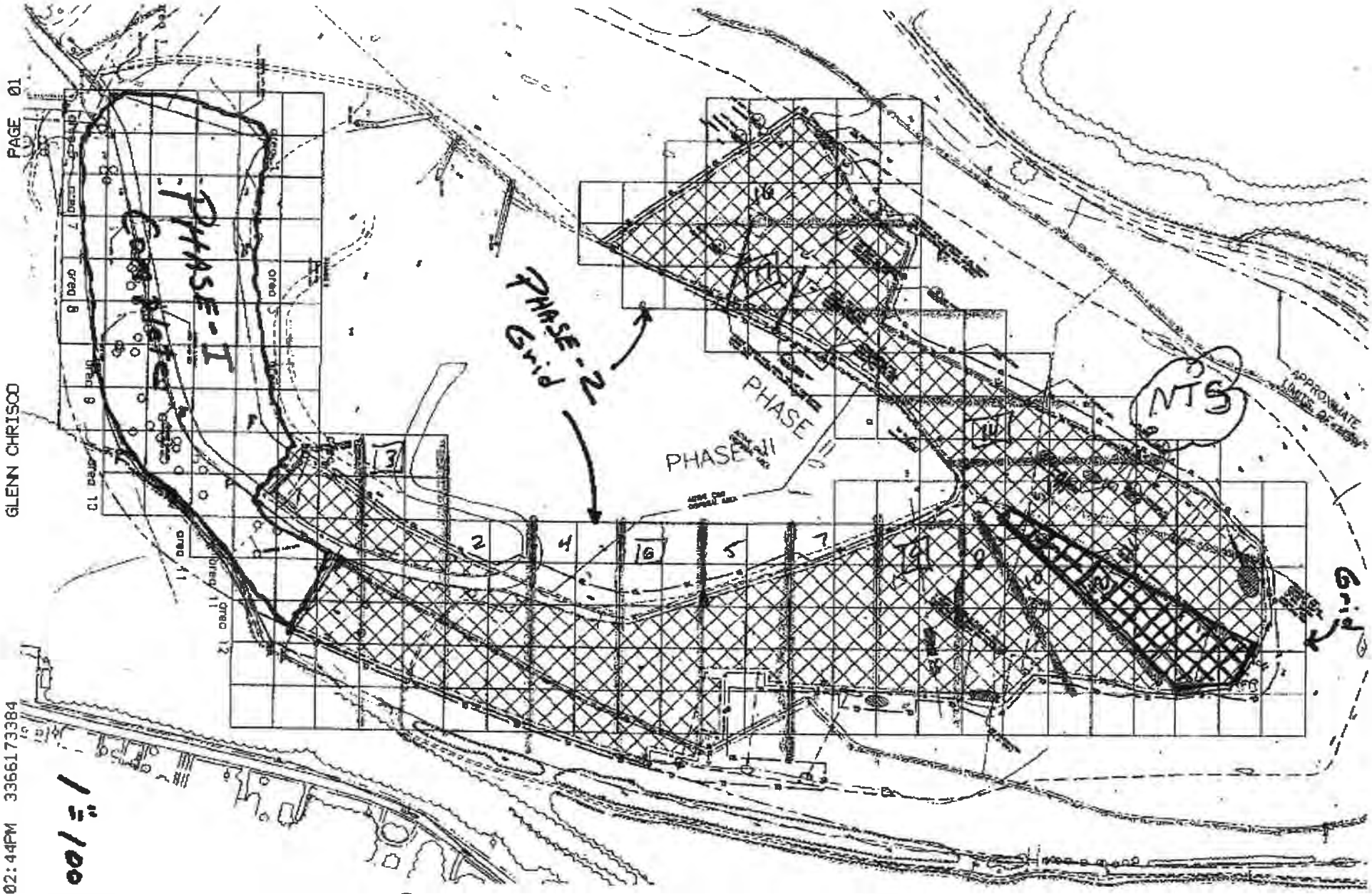
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 22'S, 278'E from NW cor of grid #10, lift #3.	0.00	5.210	1.060	4.150	.0339	122.4	200.00	175.40	14.0	107.3	D4S-6	96.1	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256276



PROOFROW OF GRID II 12
6-23-14

NORTH

20329-A
6-23-14
G. CHRISCO

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 25, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 51 06/24/2014 Soil Density

Ronald R. Newman, CWI
Corporate NDT Level III

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	51
Day & Date	Tuesday 06/24/2014
Weather	67°/ Cloudy
On-Site Time	7.25
Lab Time	0.00
Travel Time*	0.75
Total	8.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:00A	02:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 8 and 12.

Utilizing the Drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/24/14 Tuesday
Weather / Temp: 67°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 265'W, 31'S from SE cor of grid #12 prior to first lift.	-1.50	4.760	1.060	3.700	.0339	109.1	200.00	174.10	14.8	94.9	D4S-26	91.8	95	F

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 34'N,44'W from SE cor of grid #8. lift #1.	-1.00	5.210	1.060	4.150	.0339	122.4	200.00	175.20	14.1	107.2	D4S-6	95.9	95	P
3	Tested 83' N, 92'W from SE cor of grid #8, lift #2.	-0.50	5.100	1.060	4.040	.0339	119.2	200.00	179.20	11.6	106.8	D4S-6	95.6	95	P

*reobservation

Additional comments: Sample D4S-26 Test 1: Tested prior to lifts being placed. Area will be proofrolled

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256304

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/24/14 Tuesday
Weather / Temp: 67°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 184'E, 18'N from SW cor of grid #8, lift #3.	0.00	5.320	1.060	4.260	.0339	125.7	200.00	177.60	12.6	111.6	D4S-6	99.9	95	P

*reobservation

Additional comments: Sample D4S-26 Test 1: Tested prior to lifts being placed. Area will be proofrolled

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256304

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 27, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 52 06/25/2014 Densities

Sun Breza, P.E.
Construction Services Manager

Alan L. Raulston
CMT Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	52
Day & Date	Wednesday 06/25/2014
Weather	79°/ Sunny
On-Site Time	6.75
Lab Time	0.00
Travel Time*	0.75
Total	7.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Densities**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	10:00A	04:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #10.

Utilizing the drive tube test method, ASTM D-2937, to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others.

The contractor was informed that the soils were dry of optimum and would need to have water added.

By **Terry G. Chrisco, — Field Technician** 1800

680409

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/25/14
Weather / Temp: 79°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Testd 52' S, 100'W from NE cor of grid #10. lift #1	-1.00	5.480	1.460	4.020	.0330	121.8	200.00	182.30	9.7	111.0	D4S-6	99.3	95	P
2	Tested 25'N, 22'w from SE cor of grid 10, lift #1.	-1.00	5.240	1.460	3.780	.0330	114.6	200.00	184.60	8.3	105.7	D4S-6	94.6	95	F
3	Retest of #2	-1.00	5.460	1.460	4.000	.0330	121.2	200.00	183.40	9.0	111.1	D4S-6	99.4	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256305

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 27, 2014

Triangle Grading and Paving, Inc.
PO Box 2570
Burlington, NC 27216-2570

ATTN: Mr. Steve Martin

RE: **White Street Landfilll Phase II Part 2**

ECS Job # **09:20329-A**

Permits:
Location: **2503 White Street**
Greensboro, NC

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 53	06/26/2014	Densities

Sun Breza, P.E.
Construction Services Manager

Alan L. Raulston
CMT Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	53
Day & Date	Thursday 06/26/2014
Weather	76°/ Sunny
On-Site Time	7.25
Lab Time	0.00
Travel Time*	0.75
Total	8.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Densities**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 8/10.

Utilizing the drive tube test method, ASTM D-2937, to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others.

The soils observed on this date appeared to be placed in accordance with project drawings and specifications with regard to lift thickness and the contractor was informed about the moisture content being dry of optimum.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/26/14 Thursday
Weather / Temp: 76°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 20'N, 25'W from SE cor of grid #10, 2nd lift.	-1.00	5.190	1.060	4.130	.0341	121.1	200.00	180.10	11.0	109.0	D4S-6	97.6	95	P

Sample: D4S-7 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Virginia Test Method (VTM-1) Uncorrected Max. Density: 125.10 pcf Uncorrected Opt. MC: 11.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 75'S,45'W from NE cor of grid #8, 2nd lift.	-1.00	5.500	1.060	4.440	.0341	130.2	200.00	181.60	10.1	118.2	D4S-7	94.5	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256306

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

June 30, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 54	06/27/2014	Densities

Ronald R. Newman, CWI
Corporate NDT Level III

Alan L. Raulston
CMT Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	54
Day & Date	Friday 06/27/2014
Weather	72°/ Cloudy
On-Site Time	7.00
Lab Time	0.00
Travel Time*	0.75
Total	7.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Densities**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	02:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grids 10 and 12.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the S tandarde proctor method ASTM D-698. Locations and elevations of all tests are based on stakeout provided by others.

The soils observed on this date appeared to be placed in accordance with project drawings and specifications with regard to lift thickness and moisture content. The sheepsfoot operator was to start vibrating instead of static rolling the areas. This will help bring moisture to the top. If not then Triangle will need to start watering the areas that are dry.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/27/14 Friday
Weather / Temp: 72°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-1A Description: Red Orance Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 95.30 pcf Uncorrected Opt. MC: 23.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
5	Tested 388'S, 28'E from SW cor of grid #12, lift #1	-1.00	4.970	1.060	3.910	.0339	115.3	200.00	158.20	26.4	91.2	D4S-1	95.7	95	P

Sample: D4S-27 Description: Tan brown fine to medium sandy silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 97.70 pcf Uncorrected Opt. MC: 21.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 198'N, 31'E from SW cor of grid #12, lift #1.	-1.50	4.980	1.060	3.920	.0339	115.6	200.00	169.90	17.7	98.2	D4S-27	100.5	95	P

*reobservation

Additional comments: Sample D4S-27 Test 4: Had the sheepsfoot operator start vibrating instead of static rolling the areas. this will help bring moisture to the top. If not then Triangle will need to start watering the areas that are dry.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256307

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/27/14 Friday
Weather / Temp: 72°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 75'S, 40'W from NE cor of grid #10	-0.50	5.370	1.060	4.310	.0339	127.1	200.00	178.50	12.0	113.4	D4S-3	98.2	95	P
3	Tested 70'W, 36'N from SE cor of grid #10, lift 2.	-0.50	5.390	1.060	4.330	.0339	127.7	200.00	180.10	11.0	114.9	D4S-3	99.5	95	P

*reobservation

Additional comments: Sample D4S-27 Test 4: Had the sheepsfoot operator start vibrating instead of static rolling the areas. this will help bring moisture to the top. If not then Triangle will need to start watering the areas that are dry.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256307

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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 1, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
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X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 55	06/30/2014	Densities

Ronald R. Newman, CWI
Corporate NDT Level III

Alan L. Raulston
CMT Project Manager

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(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	55
Day & Date	Monday 06/30/2014
Weather	81°/ Cloudy
On-Site Time	9.50
Lab Time	0.00
Travel Time*	0.75
Total	10.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Densities**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:00A	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 10,11,12.

Utilizing the drive tube test method, ASTM D-2937, to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. The soils observed on this date appeared to be placed in accordance with project drawings and specifications with regard to lift thickness, moisture content was at or below optimum. The contractor was informed. The area will be proofrolled prior to additional fill.

By **Terry G. Chrisco, — Field Technician** 1800

680851

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/30/14 Monday
Weather / Temp: 81°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 68'S, 28'W from NE cor of grid #10, lift 2.	-0.50	5.370	1.060	4.310	.0339	127.1	200.00	175.30	14.0	111.4	D4S-6	99.7	95	P
2	Tested 32'S, 18'W from NE cor of grid #10, lift #3.	0.00	5.120	1.060	4.060	.0339	119.8	200.00	179.40	11.4	107.4	D4S-6	96.2	95	P
3	Tested prior to backfill. 100'S, 120'W from NE cor of grid #11. prior to lifts.	-1.50	5.100	1.060	4.040	.0339	119.2	200.00	181.80	10.0	108.3	D4S-6	97.0	95	P
4	Tested 387'N, 49'E from SW cor of grid #11.prior to lifts	-1.50	5.120	1.060	4.060	.0339	119.8	200.00	176.70	13.1	105.8	D4S-6	94.7	95	P
5	Tested 266' N, 28'E from SW cor of grid #11, prior to lifts.	-1.50	5.160	1.060	4.100	.0339	120.9	200.00	175.50	13.9	106.0	D4S-6	94.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256661

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 06/30/14 Monday
Weather / Temp: 81°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
6	Tested L230'N, 27'E from SW cor of grid #12, Lift 2.	-1.00	5.170	1.060	4.110	.0339	121.2	200.00	180.60	10.7	109.4	D4S-6	97.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256661

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 2, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
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X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 56	07/01/2014	Soil Densities/PR
Field Report # 57	07/02/2014	Soil Densities

Ronald R. Newman, CWI
Corporate NDT Level III

Alan L. Raulston
CMT Project Manager

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Greensboro, NC 27407
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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	56
Day & Date	Tuesday 07/01/2014
Weather	81°/ Sunny
On-Site Time	6.75
Lab Time	0.00
Travel Time*	0.75
Total	7.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks: Soil Densities/PR

Trip Charges* Tolls/Parking* Mileage* 28

Chargeable Items 1 - Basic Equipment

Time of	Arrival	Departure
	06:45A	01:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observehe placement and compaction of soils for grid #12.

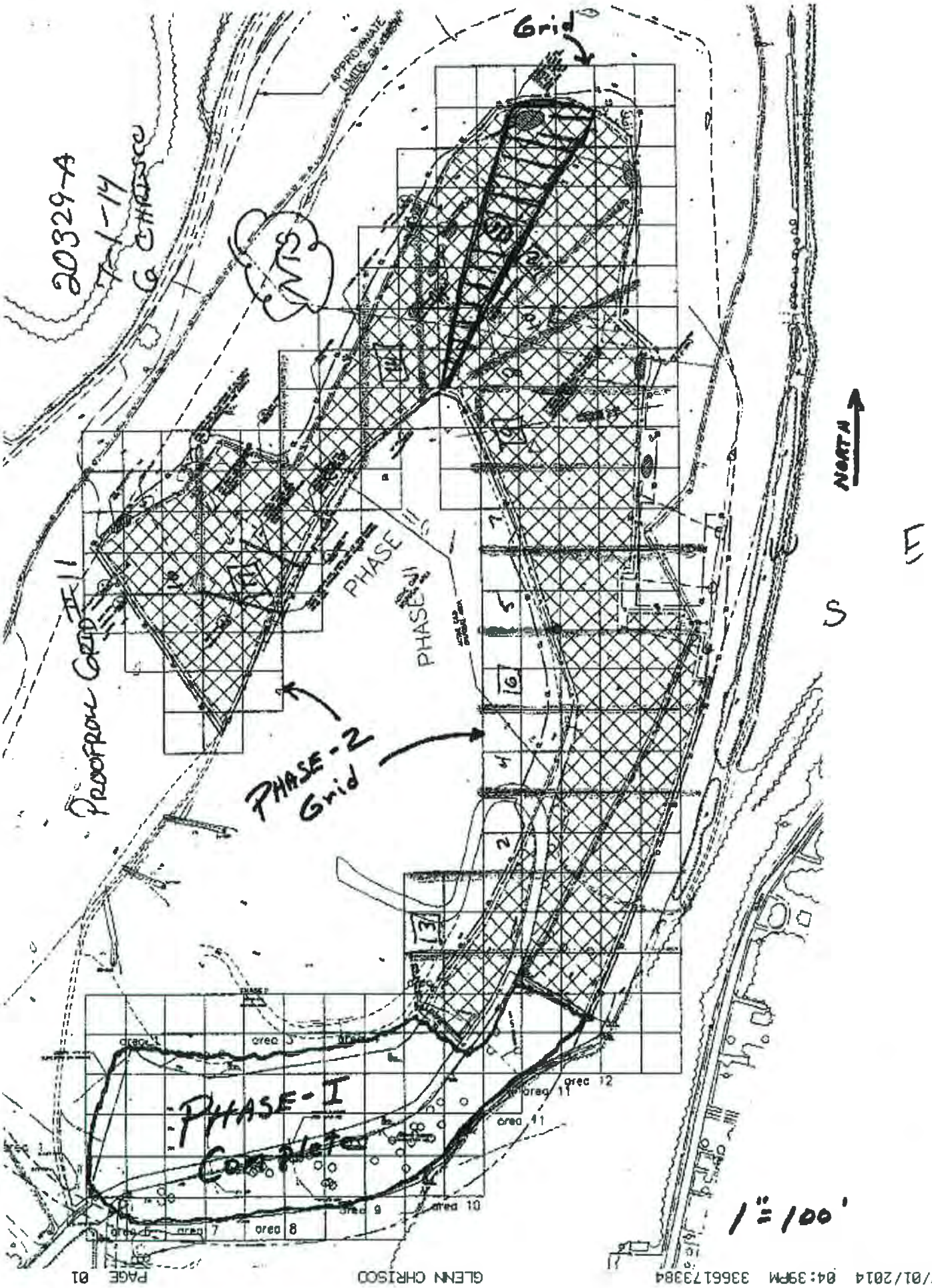
Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698. Locations and elevations of all tests are based on stakeout provided by others.

The undersigned also, as requested, observed proofrolling of grid #11. Please see the attached sketch.

Using a large rubber tired roller the identified area was proofrolled and no visible signs of pumping or rutting was observed.

By **Terry G. Chrisco, — Field Technician** 1800

680922


20329-A
7-1-14
G. Chasse
Grid
APPROXIMATE LIMITS OF SITE
NORTH
PHASE
PHASE II
PHASE-2 Grid
Proof Roll Grid II
PHASE-I Completed
area 1
area 3
area 4
area 5
area 6
area 7
area 8
area 9
area 10
area 11
area 12
1" = 100'

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/01/14 Tuesday
Weather / Temp: 81°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 61'S,28'W from NE cor of grid #12. lift 2.	-0.50	5.240	1.060	4.180	.0339	123.3	200.00	174.30	14.7	107.4	D4S-6	96.2	95	P
2	Tested 48'S,396' E from NW cor of grid #12, lift #3	0.00	5.350	1.060	4.290	.0339	126.6	200.00	178.50	12.0	112.9	D4S-6	101.1	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256662

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
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FIELD REPORT

Project No.	09:20329-A
Report No.	57
Day & Date	Wednesday 07/02/2014
Weather	75°/ Sunny
On-Site Time	6.25
Lab Time	0.00
Travel Time*	0.75
Total	7.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Densities**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:30A	01:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #12 lift #2.

Utilizing the drive tube test method, ASTM D-2937, to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others.

By **Terry G. Chrisco, — Field Technician** 1800

680961

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/02/14
Weather / Temp: 75°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 25'W, 17'S from NE cor of grid #12, lift #2.	-0.50	5.280	1.060	4.220	.0339	124.5	200.00	175.30	14.0	109.1	D4S-6	97.6	95	P

Sample: D4S-7 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Virginia Test Method (VTM-1) Uncorrected Max. Density: 125.10 pcf Uncorrected Opt. MC: 11.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 8'S, 187'W from NE cor of grid #12. lift #2.	-0.50	5.470	1.060	4.410	.0339	130.1	200.00	186.50	7.2	121.3	D4S-7	96.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256725

ECS Carolinas, LLP
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(336) 856-7150 [Phone]
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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 8, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 58 07/07/2014 Soils

Sun Breza, P.E.
Construction Services Manager

Alan L. Raulston
CMT Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	58
Day & Date	Monday 07/07/2014
Weather	63°/ Sunny
On-Site Time	2.75
Lab Time	0.00
Travel Time*	1.50
Total	4.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soils**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items

Times of	Arrival	Departure
	07:00A	09:30A
	01:00P	01:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement of soils for grid #12.

A test of the moisture prior to backfill showed the soils to be too dry. I notified Roger with Triangle of the dry soil. He went to the barrow pit, off site and had the operator dig deeper into the pit. Roger ask that I make another test to see if that helped. The moisture was within limits.

Note: When I returned to the job Roger came to me and told me that both of the dozers were down and that it would be tomorrow before his office would get him another dozer out to the job. I asked Roger if the area that they worked on this morning had been rolled, he said he did not think so and that all the guys were doing was stockpiling the soils until the dozer gets here tomorrow. I told him I would return for density testing.

By **Terry G. Chrisco, — Field Technician** 1800

ECS Carolinas, LLP
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Greensboro, NC 27407
(336) 856-7150 [Phone]
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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 9, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 59 07/08/2014 Site Observation

Sun Breza, P.E.
Construction Services Manager

Alan L. Raulston
CMT Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	59
Day & Date	Tuesday 07/08/2014
Weather	86°/ Sunny
On-Site Time	1.00
Lab Time	0.00
Travel Time*	0.75
Total	1.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Site Observation**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	12:30P	01:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement of soils on grid #12.

Upon arrival I talked with Roger the supervisor for Triangle, he said that the dozers have not been delivered as of 12:00. I checked the site to see if the soils placed on Monday had been rolled in on grid #12. The roller (sheepsfoot) operator said that they needed the dozer to level the soils out before he could roll the area. I talked with Roger to see if he had any ideal when the dozer would arrive. He did not know.

To keep from running back and forth to the job site, Roger said he would call when the dozer arrives.

By **Terry G. Chrisco, — Field Technician** 1800

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 10, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 60	07/09/2014	Soils Densities

Sun Breza, P.E.
Construction Services Manager

Alan L. Raulston
CMT Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
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FIELD REPORT

Project No.	09:20329-A
Report No.	60
Day & Date	Wednesday 07/09/2014
Weather	82°/ Cloudy
On-Site Time	6.00
Lab Time	0.00
Travel Time*	0.75
Total	6.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soils Densities**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	10:30A	04:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grid #11.

Utilizing the drive tube test method, ASTM D-2937, to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others.

By **Terry G. Chrisco, — Field Technician** 1800

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/09/14
Weather / Temp: 82°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-27 Description: Tan brown fine-medium sandy silt Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 97.70 pcf Uncorrected Opt. MC: 21.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 119'E, 10'S from NW cor of grid #11. lift #1	-1.00	5.150	1.060	4.090	.0339	120.7	200.00	161.00	24.2	97.1	D4S-27	99.4	95	P

Sample: D4S-2A Description: Red Orance Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 95.30 pcf Uncorrected Opt. MC: 22.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 406' E, 6'S from NW cor of grid #11. lift #1	-1.00	4.580	1.060	3.520	.0339	103.8	200.00	168.40	18.7	87.3	D4S-2	91.7	95	F
2	Retest of #1.	-1.00	4.980	1.060	3.920	.0339	115.6	200.00	166.90	19.8	96.4	D4S-2	101.2	95	P

*reobservation

Additional comments: Sample D4S-2A Test 1: Had area rolled more and retested.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256936

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/09/14
Weather / Temp: 82°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
4	Tested 156'E, 47'S from NW cor of grid #11, lift #2.	-0.50	5.260	1.060	4.200	.0339	123.9	200.00	176.00	13.6	109.0	D4S-6	97.6	95	P

*reobservation

Additional comments: Sample D4S-2A Test 1: Had area rolled more and retested.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256936

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 14, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 61	07/10/2014	Soil Denisty
Field Report # 62	07/11/2014	Soil Denisty

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	61
Day & Date	Thursday 07/10/2014
Weather	72°/ Rain
On-Site Time	4.50
Lab Time	0.00
Travel Time*	0.75
Total	5.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Denisty**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:00A	11:30A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement of soils at grid #11. The rain from the previous night caused the upper 2 inches of soil to become wet. The contractor pushed this material off prior to the start of fill placement.

With the threat of rain still present the contractor started stockpiling the backfill soils. At approximate 10:00 AM I called Roger and talked to him about placing the soils from the borrow pit, he agreed. At 11:00 AM the rain started again, Roger cut off all trucks from delivering soils from the offsite borrow pit. I departed shortly thereafter. No tests were perfomed on this date.

By **Terry G. Chrisco, — Field Technician** 1800

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	62
Day & Date	Friday 07/11/2014
Weather	71°/ Cloudy
On-Site Time	6.50
Lab Time	0.00
Travel Time*	1.50
Total	8.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Denisty**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	07:00A	12:00P
	02:45P	04:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #11.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible stakeout errors causing uncontrolled fill to be placed in structural areas.

The undersigned arrived back on site at 2:45, and noticed that the soils coming from the borrow pit had a lot of boulders mixed with the soil. I called Roger with Triangle Grading and informed him that the operator of the trackhoe needed to move to another location in the pit due to the soils having too many large boulders.

By **Terry G. Chrisco, — Field Technician** 1800

681895

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/11/14 Friday
Weather / Temp: 71°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-1A Description: Red Orance Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 95.30 pcf Uncorrected Opt. MC: 23.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 74;S, 275'W from NE corner of grid #11, lift #3	0.00	5.140	1.060	4.080	.0341	119.7	200.00	158.30	26.3	94.7	D4S-1	99.4	95	P

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 18'S, 266'W from NE corner of grid #11, lift #2	-0.50	5.290	1.060	4.230	.0341	124.1	200.00	162.90	22.7	101.0	D4S-26	97.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:256938

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4811 Koger Boulevard
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(336) 856-7150 [Phone]
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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 15, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 63	07/14/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	63
Day & Date	Monday 07/14/2014
Weather	86°/ Sunny
On-Site Time	3.75
Lab Time	0.00
Travel Time*	0.75
Total	4.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	08:00A	11:45A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #11.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

682358

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/14/14 Monday
Weather / Temp: 86°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 35'S, 109' W from NE corner of grid #11. lift #2.	-0.50	5.100	1.060	4.040	.0339	119.2	200.00	172.00	16.2	102.5	D4S-17	97.5	95	P

Sample: D4S-27 Description: Tan brown fine to medium sandy silt. Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 97.70 pcf Uncorrected Opt. MC: 21.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 40'S, 61'W from NE corner of grid #11 lift 1.	-1.00	5.010	1.060	3.950	.0339	116.5	200.00	165.80	20.6	96.5	D4S-27	98.8	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257347

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 17, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 64	07/15/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	64
Day & Date	Tuesday 07/15/2014
Weather	83°/ Sunny
On-Site Time	7.50
Lab Time	0.00
Travel Time*	0.75
Total	8.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:30A	03:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 13 and 14 prior to the placement of fill.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Note: The contractor requested the technician to stay onsite to observe the installation of fill due to the amount of rock that could possible get placed in the fill material.

By **Terry G. Chrisco, — Field Technician** 1800

682491

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/15/14 Tuesday
Weather / Temp: 83°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-1A Description: Red Orance Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 95.30 pcf Uncorrected Opt. MC: 23.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 55'N, 116'E from NW corner of grid #13. prior to fill.	-1.50	4.750	1.060	3.690	.0341	108.2	200.00	169.50	17.9	91.6	D4S-1	96.2	95	P
3	Tested 40'N, 240'E from SW corner of grid #14. prior to fill.	-1.50	4.690	1.060	3.630	.0341	106.5	200.00	170.20	17.5	90.6	D4S-1	95.1	95	P
4	Tested 25'S, 27'E from NW corner of grid #14. prior to fill	-1.50	4.680	1.060	3.620	.0341	106.2	200.00	170.00	17.6	90.2	D4S-1	94.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257348

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/15/14 Tuesday
Weather / Temp: 83°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-26 Description: Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 103.40 pcf Uncorrected Opt. MC: 19.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 28'N,81'W from SE corner of grid #13. prior to fill.	-1.50	4.980	1.060	3.920	.0341	115.0	200.00	173.00	15.6	99.4	D4S-26	96.2	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257348

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Greensboro, NC 27407
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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 17, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 65 07/16/2014 Proofroll

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	65
Day & Date	Wednesday 07/16/2014
Weather	83°/ Sunny
On-Site Time	1.00
Lab Time	0.00
Travel Time*	0.75
Total	1.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Proofroll**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	12:45P	01:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe a proof roll of grids 13 and 14.

Due to the heavy rain the night before made the area too wet to proofroll. The contractor wanted to wait until after lunch to see if the area would be dry enough to perform a proofroll. At 12:45 the area still was not dry enough to perform a proofroll. Roger decided to wait until tomorrow to proofroll. ECS was not notified of the cancellation of the proofroll.

By **Terry G. Chrisco, — Field Technician** 1800

682641

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 18, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 66 07/17/2014 Proofroll

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	66
Day & Date	Thursday 07/17/2014
Weather	61°/ Sunny
On-Site Time	3.00
Lab Time	0.00
Travel Time*	0.75
Total	3.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Proofroll**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:00A	10:00A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

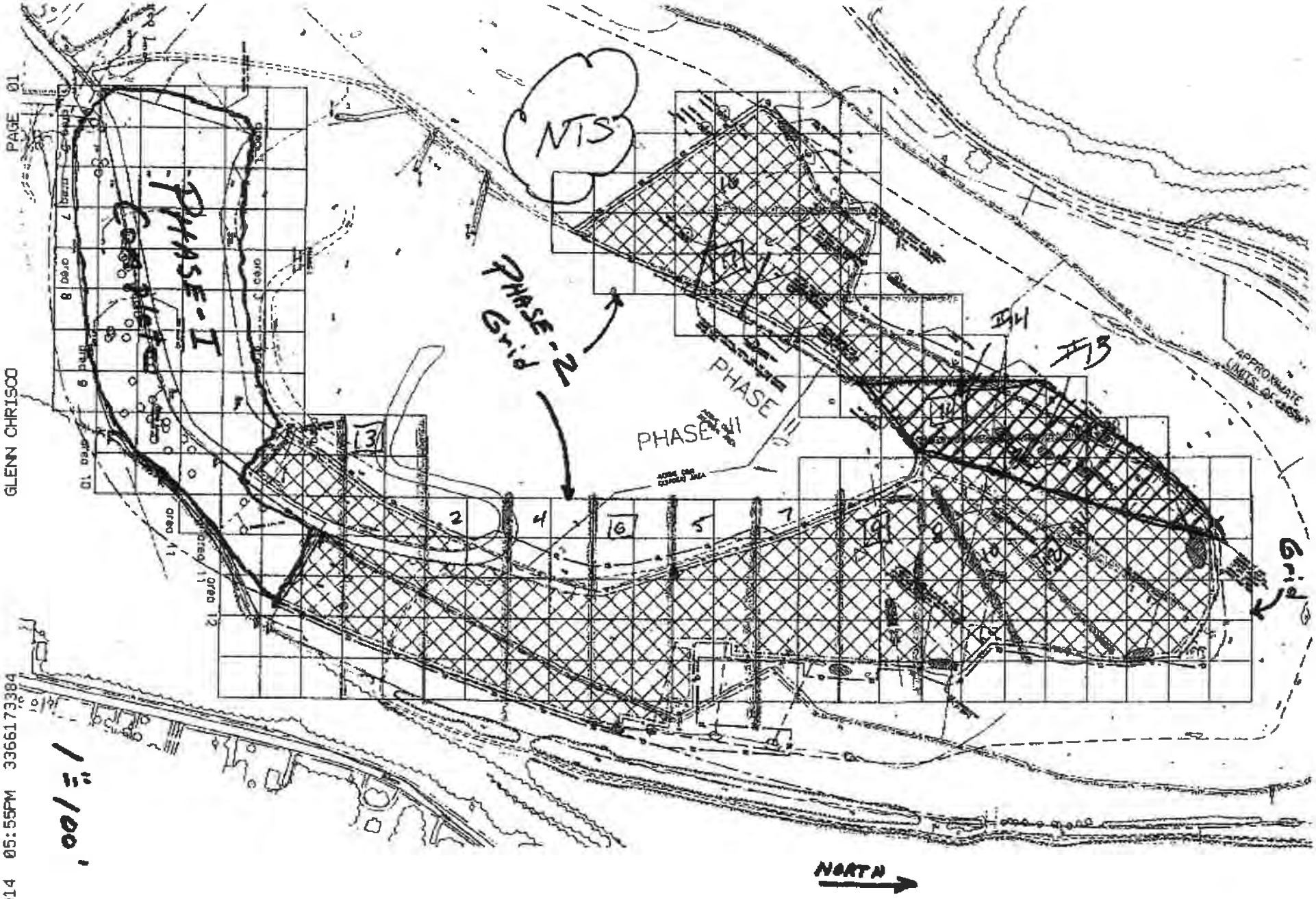
The undersigned arrived on-site, as requested, to observe the proofrolling of Grids 13 and 14. Please see the attached sketch.

Using a loaded rubber vehicle the identified area was proofrolled and no visible signs of pumping or rutting was observed.

Note: The areas were being staked while being proofrolled.

By **Terry G. Chrisco, — Field Technician** 1800

682847



20329-A
G. CHRISCO
PARKROW AT WHITE ST.

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 20, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 67 07/18/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	67
Day & Date	Friday 07/18/2014
Weather	80°/ Cloudy
On-Site Time	2.00
Lab Time	0.00
Travel Time*	0.75
Total	2.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	11:00A	01:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for Grids 13 and 14.

Utilizing the drive tube test method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

682998

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/18/14 Friday
Weather / Temp: 80°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-19 Description: Tan Brown Silty Fine to Medium SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.40 pcf Uncorrected Opt. MC: 14.50 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested in grid #14. 19'N, 40'E from SW cor of grid 14, 1st lift.	-1.00	5.250	1.060	4.190	.0339	123.6	200.00	173.20	15.4	107.0	D4S-19	96.0	95	P
2	Tested in grid #13, Tested 56'N,58'E from SW cor of grid #13. 1st lift.	-1.00	5.280	1.060	4.220	.0339	124.5	200.00	177.60	12.6	110.5	D4S-19	99.2	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257351

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 21, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 68	07/19/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	68
Day & Date	Saturday 07/19/2014
Weather	63°/ Cloudy
On-Site Time	0.50
Lab Time	0.00
Travel Time*	0.75
Total	1.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	08:00A	08:30A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement of soils on grids 13 and 14.

Upon arrival Roger met me and stated they were taking the day off due to his help did not show up. ECS will be schedule for testing and observations at a later date.

By **Terry G. Chrisco, — Field Technician** 1800

683152

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 22, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 69 07/21/2014 Cancellation

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	69
Day & Date	Monday 07/21/2014
Weather	68°/ Cloudy
On-Site Time	0.25
Lab Time	0.00
Travel Time*	0.75
Total	1.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Cancellation**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:30A	07:45A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe placement of soils for grids 13 and 14.

Upon arrival the technician observed that no grading crew was onsite. Roger was contacted and he inform me that no work would be performed due to the areas were too wet. The technician informed Roger to please call and cancell testing if they are not going to be working.

By **Terry G. Chrisco, — Field Technician** 1800

683425

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 24, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 70	07/22/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	70
Day & Date	Tuesday 07/22/2014
Weather	70°/ Cloudy
On-Site Time	0.75
Lab Time	0.00
Travel Time*	0.75
Total	1.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:30A	08:15A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement of soils on grids 13 and 14.

Upon arrival the technician observed the areas that need to have fill placed. The areas were too wet to place new fill on. Roger was informed that the areas were too wet to place fill on.

Roger then asked me to look at areas were they removed 1-2 inches of wet soils. These areas are also too wet to place fill on. ECS will be scheduled for testing at a later date.

By **Terry G. Chrisco, — Field Technician** 1800

683563

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 25, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 71 07/23/2014 Soil Density/PR

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	71
Day & Date	Wednesday 07/23/2014
Weather	80°/ Sunny
On-Site Time	4.75
Lab Time	0.00
Travel Time*	0.75
Total	5.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/PR**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	09:30A	02:15P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 13 and 14.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

The undersigned also observed the proofrolling of grid #15. Using a loaded rubber tire vehicle the identified area was proofrolled and no visible signs of pumping or rutting were observed. Please see the attached sketch.

By **Terry G. Chrisco, — Field Technician** 1800

683722

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/23/14
Weather / Temp: 80°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 190'W, 34'N from SE corner of grid #13, lift 1	-1.00	5.160	1.060	4.100	.0341	120.2	200.00	172.10	16.2	103.4	D4S-17	98.4	95	P
2	Tested 220'W, 60' N from SE corner of grid #14. lift 1.	-1.00	5.110	1.060	4.050	.0341	118.8	200.00	170.40	17.3	101.2	D4S-17	96.3	95	P

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

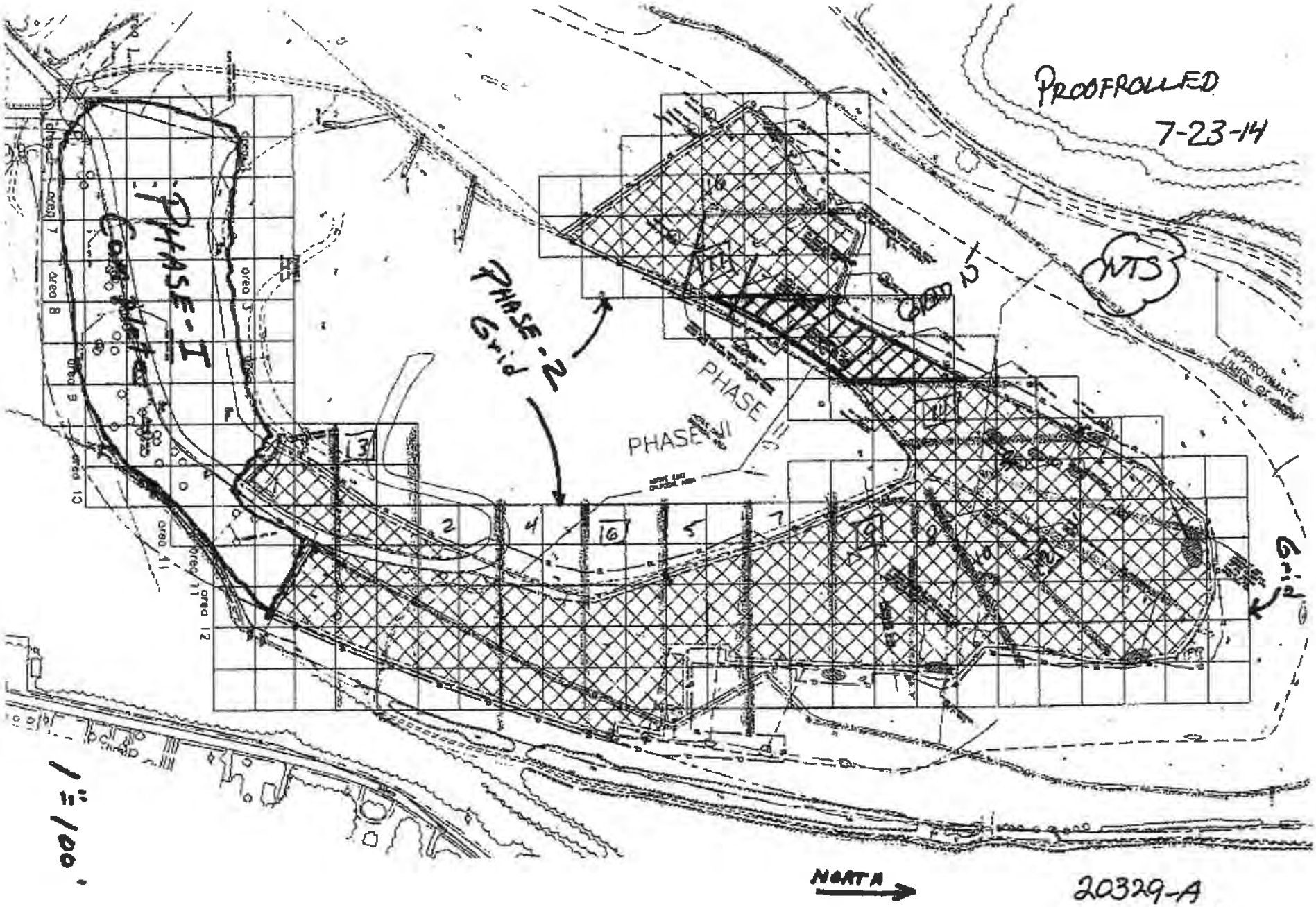
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 74'S, 38'E from NW corner of grid #13. lift 2.	-0.50	5.340	1.060	4.280	.0341	125.5	200.00	181.00	10.4	113.5	D4S-3	98.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257845



20329-A
G. CHRISCO
GRID #15
PROOFROLL

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 28, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 73	07/25/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	73
Day & Date	Friday 07/25/2014
Weather	72°/ Sunny
On-Site Time	4.50
Lab Time	0.00
Travel Time*	0.75
Total	5.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:30A	12:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 16 and 17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D-698 07 method A standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

684118

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/25/14 Friday
Weather / Temp: 72°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-17 Description: Tan Brown Fine to Medium Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 105.10 pcf Uncorrected Opt. MC: 16.10 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 190'W, 114'N from SE corner of grid #1, prior to backfill.	-1.50	4.920	1.060	3.860	.0341	113.2	200.00	178.00	12.3	100.7	D4S-17	95.8	95	P

Sample: D4S-5 Description: Red Fine Sandy SILT Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 94.70 pcf Uncorrected Opt. MC: 20.40 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
3	Tested 38'E, 158'S from NW corner of grid #16, prior to backfill.	-1.50	4.520	1.060	3.460	.0341	101.5	200.00	170.50	17.3	86.5	D4S-5	91.3	95	F

*reobservation

Additional comments: Sample D4S-5 Test 3: area will be proofrolled

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257838

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/25/14 Friday
Weather / Temp: 72°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 80'N,187'E from SW corner of grid #17, Prior to backfill	-1.50	5.120	1.060	4.060	.0341	119.1	200.00	180.00	11.1	107.1	D4S-6	95.9	95	P
4	Tested 50' S, 101'W from NE corner of grid #16, Prior to backfill.	-1.50	5.310	1.060	4.250	.0341	124.6	200.00	178.90	11.7	111.4	D4S-6	99.7	95	P

*reobservation

Additional comments: Sample D4S-5 Test 3: area will be proofrolled

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:257838

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 30, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 74	07/28/2014	Soil Density
Field Report # 75	07/29/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	74
Day & Date	Monday 07/28/2014
Weather	71°/ Sunny
On-Site Time	7.25
Lab Time	0.00
Travel Time*	0.75
Total	8.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:45A	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 16 and 17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Standard A Method.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Also while onsite the undersigned observed the proofrolling of grids 16 and 17. Using a loaded rubber tire vehicle, the identified area was proofrolled and no visible signs of pumping or rutting were observed. Please see the attached sketch for locations.

By **Terry G. Chrisco, — Field Technician** 1800

684503

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/28/14 Monday
Weather / Temp: 71°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 81'E, 33' N from SW corner of grid 13. lift 3.	0.00	5.240	1.060	4.180	.0341	122.6	200.00	185.60	7.7	113.7	D4S-3	98.5	95	P

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

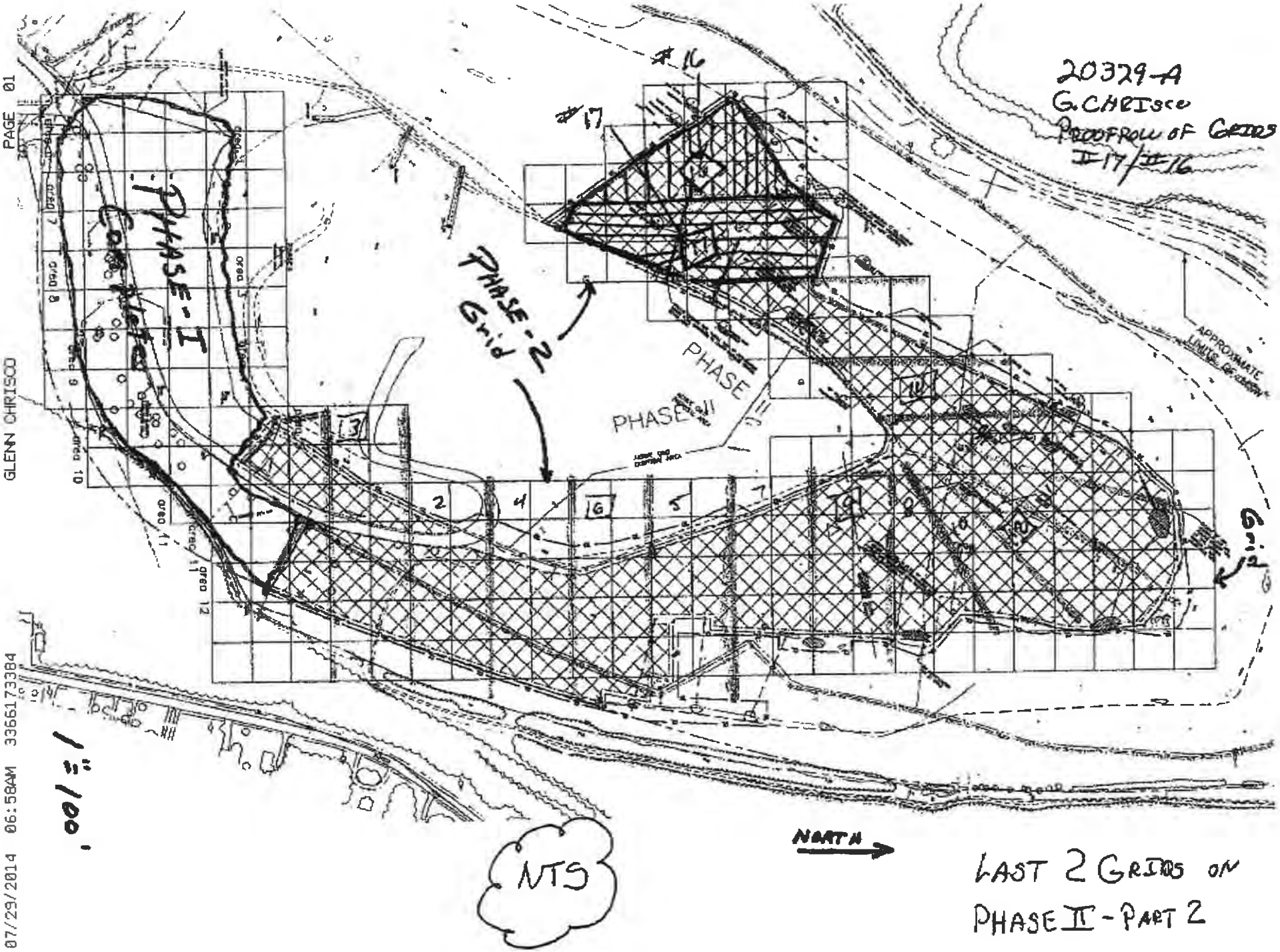
Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 46'N,95'E from SW corner of grid #14, lift #3.	0.00	5.200	1.060	4.140	.0341	121.4	200.00	172.60	15.8	104.7	D4S-6	93.7	95	F
3	Retest of #2.	0.00	5.380	1.060	4.320	.0341	126.7	200.00	176.00	13.6	111.4	D4S-6	99.8	95	P

*reobservation

Additional comments: Sample D4S-6 Test 2: Had area rolled more and retested.

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258264


20329-A
G. CHRISCO
PROOFROLL OF GRIDS
II-17/II-16
#16
#17
PHASE-2 Grid
PHASE-I
PHASE
PHASE II
APPROXIMATE LIMITS OF GRADING
Grid 2
NORTH
NTS
1" = 100'
LAST 2 GRIDS ON
PHASE II - PART 2

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	75
Day & Date	Tuesday 07/29/2014
Weather	66°/ Sunny
On-Site Time	5.25
Lab Time	0.00
Travel Time*	1.50
Total	6.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items

Times of	Arrival	Departure
	09:30A	11:00A
	12:15P	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grids 13, 14 and 15.

Utilizing the drive method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the ASTM D 698-07 Method A Standard.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

684633

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/29/14 Tuesday
Weather / Temp: 66°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 18'S, 94' W from NE corner of grid #14.	0.00	5.550	1.460	4.090	.0330	123.9	200.00	177.30	12.8	109.8	D4S-6	98.3	95	P
3	Tested 44'S, 53W form NE corner of grid #15. lift 1.	-1.50	5.430	1.460	3.970	.0330	120.3	200.00	180.40	10.8	108.5	D4S-6	97.1	95	P
4	Tested 75'W, 45'N from SE corner of grid #13.	0.00	5.120	1.060	4.060	.0341	119.1	200.00	183.40	9.0	109.2	D4S-6	97.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258265

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

July 31, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
	Location: **2503 White Street** **Greensboro, NC**
ATTN: Mr. Steve Martin	

We are enclosing:

_X_ Materials Engineering Division Reports
_X_ For your use
_X_ As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 76	07/30/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	76
Day & Date	Wednesday 07/30/2014
Weather	59°/ Sunny
On-Site Time	5.25
Lab Time	0.00
Travel Time*	1.50
Total	6.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	08:15A	12:15P
	02:45P	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #15.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

684813

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/30/14
Weather / Temp: 59°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 61'S, 118'W from NE corner of grid #15. lift 1.	-1.00	5.700	1.460	4.240	.0330	128.5	200.00	173.20	15.4	111.2	D4S-6	99.6	95	P

Sample: D4S-7 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 125.10 pcf Uncorrected Opt. MC: 11.00 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 21'N, 139'E from SW corner of grid #15.lift #2.	-0.50	5.830	1.460	4.370	.0330	132.4	200.00	180.40	10.8	119.4	D4S-7	95.4	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258266

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 1, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 77 07/31/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	77
Day & Date	Thursday 07/31/2014
Weather	63°/ Sunny
On-Site Time	6.75
Lab Time	0.00
Travel Time*	0.75
Total	7.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:45A	02:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #15.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

684990

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 07/31/14 Thursday
Weather / Temp: 63°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 31'S, 61'W from NE corner of grid #15, lift #2.	-0.50	5.720	1.460	4.260	.0330	129.1	200.00	177.70	12.5	114.7	D4S-3	99.3	95	P
2	Tested 23'S,85'W from NE corner of grid #15, lift 3	0.00	5.490	1.460	4.030	.0330	122.1	200.00	183.10	9.2	111.7	D4S-3	96.7	95	P
3	Tested 32'N, 274'W from SE corner of grid #15, lift #3.	0.00	5.540	1.460	4.080	.0330	123.6	200.00	181.10	10.4	111.9	D4S-3	96.9	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258267

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 4, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 78	08/04/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	78
Day & Date	Monday 08/04/2014
Weather	77°/ Sunny
On-Site Time	2.25
Lab Time	0.00
Travel Time*	0.75
Total	3.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	11:15A	01:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid 17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

685267

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/04/14 Monday
Weather / Temp: 77°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 139'E, 87'N from SW corner of grid #17, lift 1	-1.00	5.090	1.060	4.030	.0339	118.9	200.00	178.60	11.9	106.1	D4S-6	95.0	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258652

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Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 6, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 79	08/05/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	79
Day & Date	Tuesday 08/05/2014
Weather	67°/ Sunny
On-Site Time	5.75
Lab Time	0.00
Travel Time*	0.75
Total	6.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	01:45P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

685364

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/05/14 Tuesday
Weather / Temp: 67°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 212'E, 20'N from SW corner of grid #17, lift #1.	-1.00	5.180	1.060	4.120	.0339	121.5	200.00	178.10	12.2	108.1	D4S-6	96.8	95	P
2	Tested 235'W, 31'S from NE corner of grid #17, lift #1.	-1.00	5.220	1.060	4.160	.0339	122.7	200.00	175.00	14.2	107.3	D4S-6	96.1	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258653

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 8, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 80	08/06/2014	Soil Density
Field Report # 81	08/07/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	80
Day & Date	Wednesday 08/06/2014
Weather	67°/ Sunny
On-Site Time	1.00
Lab Time	0.00
Travel Time*	0.75
Total	1.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	08:00A	09:00A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

685450

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/06/14
Weather / Temp: 67°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 43'S, 166'W from NE corner of grid #17, lift #1.	-1.00	5.150	1.060	4.090	.0339	120.7	200.00	180.20	10.9	108.7	D4S-6	97.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258654

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	81
Day & Date	Thursday 08/07/2014
Weather	85°/ Sunny
On-Site Time	1.75
Lab Time	0.00
Travel Time*	0.75
Total	2.50
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	11:45A	01:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

685549

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/07/14 Thursday
Weather / Temp: 85°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 33'S, 84'W from NE corner of grid #17 loft #2	-0.50	5.100	1.060	4.040	.0339	119.2	200.00	179.20	11.6	106.8	D4S-6	95.6	95	P
2	Tested, 224'W, 99'S fron NE corner of grid #17 lift #2.	-0.50	5.230	1.060	4.170	.0339	123.0	200.00	178.70	11.9	109.9	D4S-6	98.3	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258655

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 12, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 82 08/08/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	82
Day & Date	Friday 08/08/2014
Weather	66°/ Cloudy
On-Site Time	2.00
Lab Time	0.00
Travel Time*	0.75
Total	2.75
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	07:30A	09:30A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #17.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the standard Proctor method (ASTM D-698).

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

685652

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/08/14 Friday
Weather / Temp: 66°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 88.N,343'E from SW cor of grid #17, lift #3	0.00	5.360	1.060	4.300	.0339	126.8	200.00	180.20	10.9	114.2	D4S-3	98.9	95	P
2	Tested 83'S, 137'W fron NE cor of grid #17	0.00	5.420	1.060	4.360	.0339	128.6	200.00	175.50	13.9	112.8	D4S-3	97.7	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:258656

ECS Carolinas, LLP
4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]
NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 20, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 84 08/19/2014 Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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Greensboro, NC 27407
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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	84
Day & Date	Tuesday 08/19/2014
Weather	78°/ Cloudy
On-Site Time	5.25
Lab Time	0.00
Travel Time*	2.00
Total	7.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **80**

Chargeable Items **1 - Basic Equipment**

Times of	Arrival	Departure
	09:15A	11:30A
	12:30P	03:30P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #16.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1800

686951

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/19/14 Tuesday
Weather / Temp: 78°F Cloudy

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	tested 137'N, 279'W from SE corner of grid #16. lift #1.	-1.00	5.270	1.060	4.210	.0339	124.2	200.00	168.00	19.0	104.3	D4S-6	93.4	95	F
2	tested 137'N, 279'W from SE corner of grid #16. lift #1	-1.00	5.250	1.060	4.190	.0339	123.6	200.00	177.50	12.6	109.6	D4S-6	98.2	95	P
3	Tested 50'N, 76'E from SW corner of grid #16, lift #1.	-1.00	5.120	1.060	4.060	.0339	119.8	200.00	180.10	11.0	107.8	D4S-6	96.5	95	P

*reobservation

Additional comments: Sample D4S-6 Test 2: Retest of #1

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:259399

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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 21, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 85	08/20/2014	Soil Density/Tubes

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	85
Day & Date	Wednesday 08/20/2014
Weather	82°/ Sunny
On-Site Time	6.75
Lab Time	0.00
Travel Time*	1.50
Total	8.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density/Tubes**

Trip Charges* Tolls/Parking* Mileage* **56**

Chargeable Items

Times of	Arrival	Departure
	07:30A	12:30P
	02:15P	04:00P

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #16.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

Grid #16 each lift had a Shelby tube inserted for a perm test. These tubes were delivered to the ECS laboratory for testing. Lifts 2/3 are in the same tube.

By **Terry G. Chrisco, — Field Technician** 1700

687153

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/20/14
Weather / Temp: 82°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer, Field data, locations, and depths are estimates.

Sample: D4S-3 Description: Tan Brown Silty Fine to Coarse SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 115.50 pcf Uncorrected Opt. MC: 12.80 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 28'S, 180'W from NE cor of grid #16. lift #2.	-0.50	5.500	1.060	4.440	.0339	131.0	200.00	175.80	13.7	115.1	D4S-3	99.6	95	P

Sample: D4S-8 Description: Green Tan Fine Silty SAND Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 109.50 pcf Uncorrected Opt. MC: 15.90 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
2	Tested 27'E, 157'S from NW cor of grid #16, lift #2.	-0.50	5.330	1.060	4.270	.0339	126.0	200.00	170.60	17.2	107.4	D4S-8	98.1	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:259518

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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 25, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
ATTN: Mr. Steve Martin	Permits: Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 86	08/22/2014	Soil Density

Sun Breza, P.E.
Construction Services Manager

Adrian L. Gaylord
Project Manager

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4811 Koger Boulevard
Greensboro, NC 27407
(336) 856-7150 [Phone]
(336) 856-7160 [Fax]

FIELD REPORT

Project No.	09:20329-A
Report No.	86
Day & Date	Friday 08/22/2014
Weather	73°/ Sunny
On-Site Time	1.25
Lab Time	0.00
Travel Time*	0.75
Total	2.00
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Soil Density**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items **1 - Basic Equipment**

Time of	Arrival	Departure
	09:30A	10:45A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested, to observe the placement and compaction of soils for grid #16.

Utilizing the drive tube method to check the compaction of soils; test results indicated that the compacted material, at the areas and elevations tested, met or exceeded the project requirements of 95% of the maximum dry density as obtained in our laboratory using the Standard Proctor Method ASTM D-698.

Locations and elevations of all tests are based on stakeout provided by others. We cannot be responsible for stakeout errors causing uncontrolled fill to be placed in structural areas.

By **Terry G. Chrisco, — Field Technician** 1700

687452

ECS CAROLINAS, LLP

Drive Tube Method
Field Density Report

Project: White Street Landfilll Phase II Part 2
Location: Greensboro
Client: Triangle Grading and Paving, Inc.
Permits:

Project No. 20329-A
Day/Date: 08/22/14 Friday
Weather / Temp: 73°F Sunny

The undersigned arrived on site, as requested, to perform compaction testing on soils utilizing the Drive Tube Method (ASTM D-2937). The locations and results of the tests performed on this date are as follows:

These results are preliminary until signed by an ECS Engineer. Field data, locations, and depths are estimates.

Sample: D4S-6 Description: Tan Brown Fine Silty SAND with CLAY Proctor Method: Standard Proctor Method (ASTM D-698) Uncorrected Max. Density: 111.70 pcf Uncorrected Opt. MC: 14.70 %

Test No.	Test Location	Depth from Subgrade	Tube & Soil Weight	Tube Weight	Soil Weight	Tube Volume	Wet Unit Weight	Wet Weight	Dry Weight	Moisture	Dry Unit Weight	Proctor Number	Actual %	Spec. %	Pass or Fail
1	Tested 32'S, 33'W from NE corner of grid #16. lift #3.	0.00	5.600	1.410	4.190	.0339	123.6	200.00	174.50	14.6	107.8	D4S-6	96.5	95	P

*reobservation

Additional comments:

Print Name: Terry G. Chrisco
ECS CAROLINAS, LLP

WO:259667

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NC Registered Engineering Firm # F-1078

LETTER OF TRANSMITTAL

August 29, 2014	RE: **White Street Landfilll Phase II Part 2**
Triangle Grading and Paving, Inc. PO Box 2570 Burlington, NC 27216-2570	ECS Job # **09:20329-A**
	Permits:
ATTN: Mr. Steve Martin	Location: **2503 White Street** **Greensboro, NC**

We are enclosing:

X Materials Engineering Division Reports
X For your use
X As requested

CC: **Triangle Grading and Paving, Inc. - Travis Sharpe**

ENCL:

Field Report # 87	08/28/2014	Site obs.

Sun Breza, P.E.
Construction Services Manager

Harry Slater, Jr., Lab Manager
Project Manager

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FIELD REPORT

Project No.	09:20329-A
Report No.	87
Day & Date	Thursday 08/28/2014
Weather	74°/ Sunny
On-Site Time	1.50
Lab Time	0.00
Travel Time*	0.75
Total	2.25
Re Obs.Time	0.00

Project	White Street Landfilll Phase II Part 2
Location	Greensboro, NC
Client	Triangle Grading and Paving, Inc. - Steve Martin
Contractor	Triangle Grading and Paving, Inc. - Steve Martin

Remarks **Site obs.**

Trip Charges* Tolls/Parking* Mileage* **28**

Chargeable Items

Time of	Arrival	Departure
	07:45A	09:15A

* Travel time and mileage will be billed in accordance with the contract.

Summary of Services Performed (field test data, locations, elevations & depths are estimates) & Individuals Contacted.

The undersigned arrived on site, as requested by HDR from Raleigh, to observe the placement of the drain pipe on grid #17.

The undersigned spoke with Roger with Triangle about doing a density test on top of the pipeline. He declined the test stating that compaction could not be performed with satisfactory results due to the spring effect of the pipe used.

By **Terry G. Chrisco, — Field Technician** 1700

688446

A2

Borrow Source Characterization Study

(On-Site Soil)

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Laboratory Testing Summary

Sample Source	Sample Number	Depth (inches)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Permeability
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
On Site #13												
	D4S-3	30.00 - 30.00		MH	69	46	23	90.6	82.1	35.5		1.6E-07
On Site #7												
	D4S-2	30.00 - 30.00		MH	63	41	22	78.2	88.8	29.0		7.2E-07
On Site #2												
	D4S-1	30.00 - 30.00		MH	60	39	21	85.9	87.9	30.4		8.7E-08
On Site #16												
	D4S-4	30.00 - 30.00		MH	75	42	33	83.8	87.2	31.6		1.2E-07
On Site #11												
	D4S-10	30.00 - 30.00		CH	68	31	37	84.6	88.1	29.8		2.3E-07
On Site #6												
	D4S-7	36.00 - 36.00		MH	69	41	28	77.4	83.9	30.6		2.3E-07
On Site #1												
	D4S-5	24.00 - 24.00		MH	68	43	25	96.2	82.5	33.3		7.2E-08
On Site #9												
	D4S-8	36.00 - 36.00		CH	50	27	23	64.4	103.4	19.9		2.1E-07
On Site #3												
	D4S-6	30.00 - 30.00		MH	66	34	32	77.2	91.5	25.9		2.2E-06
On Site #15												
	D4S-12	0.00 - 0.00		MH	70	38	32	86.4	91.3	28.0		8.9E-07
On Site #10												
	D4S-9	30.00 - 30.00		MH	66	35	31	83.8	88.4	29.5		6.7E-07
On Site												

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No.	**21579**
Project Name:	**White Street Landfill Phase II 12.040**
PM:	**Terry Pope**
PE:	**Sun Breza**
Printed On:	**Tuesday, October 02, 2012**

ECS Carolinas, LLP

Greensboro, NC

Laboratory Testing Summary

Sample Source	Sample Number	Depth (inches)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Permeability
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
#14												
	D4S-11	0.00 - 0.00		MH	64	34	30	75.1	91.5	27.5		2.5E-07

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No.	**21579**
Project Name:	**White Street Landfill Phase II 12.040**
PM:	**Terry Pope**
PE:	**Sun Breza**
Printed On:	**Tuesday, October 02, 2012**

ECS Carolinas, LLP

Greensboro, NC

A3

Borrow Source Characterization Study

(Off-Site Soil)

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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BORROW PIT #2												
	D4S-2	0.00 - 0.00	23.7	SM	43	29	14	37.7	102.1	18.3		1.200E-5
BORROW PIT #3												
	D4S-3	0.00 - 0.00	28.5	MH	59	35	24	91.7	87.0	27.4		4.600E-8
BORROW PIT #10												
	D4S-10	0.00 - 0.00	19.9	ML	37	30	7	64.7	112.6	15.1		2.600E-6
BORROW PIT #7												
	D4S-7	0.00 - 0.00	14.3	SC	24	15	9	42.7	125.1	11.0		4.800E-8
BORROW PIT #11												
	D4S-11	0.00 - 0.00	34.0	ML	46	32	14	77.5	93.9	21.9		8.00E-6
BORROW PIT #4												
	D4S-4	0.00 - 0.00	16.1	SC	31	17	14	48.2	119.3	12.2		4.500E-8
BORROW PIT #5												
	D4S-5	0.00 - 0.00	30.0	ML	42	31	11	63.9	97.7	21.7		4.500E-8
BORROW PIT #9												
	D4S-9	0.00 - 0.00	16.3	SM	30	27	3	28.1	114.6	12.7		7.800E-7
BORROW PIT #1												
	D4S-1	0.00 - 0.00	32.7	MH	55	33	22	64.9	95.3	23.9		6.900E-07
BORROW PIT #8												
	D4S-8	0.00 - 0.00	20.9	SM	36	29	7	48.6	109.5	15.9		3.00E-6
BORROW PIT #12												
	D4S-12	0.00 - 0.00	18.4	SC	40	25	15	31.9	108.8	15.8		4.200E-5
BORROW PIT #6												
	D4S-6	0.00 - 0.00	20.5	SC	38	25	13	44.0	111.7	14.7		1.400E-7

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 20329-B
Project Name: White Street - Landfill
PM: Adrian L. Gaylord
PE: Sun Breza
Printed On: Tuesday, April 22, 2014

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Red Orange Fine Sandy SILT
NUMBER	09-20329-B	**NUMBER**	D4S-1
DATE	3/27/2014	**Location**	Borrow Pit #1
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	96.00%
Height (in)	5.621	95.3	91.5	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	23.90%	25.90%	2.55

Confining Pressure (psi)	47.90
Top Burette Pressure (psi)	44.80
Base Burette Pressure (psi)	39.80

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	6.900E-07

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Yellow Brown Fine Silty Clayey SAND
NUMBER	09-20329-B	**NUMBER**	D4S-2
DATE	3/27/2014	**Location**	Borrow Pit #2
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.70%
Height (in)	5.621	102.1	97.7	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	18.30%	20.30%	2.5

Confining Pressure (psi)	52.87
Top Burette Pressure (psi)	49.87
Base Burette Pressure (psi)	40.10

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	1.200E-05

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

ECS Carolinas, LLP
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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Yellow Brown Fine Sandy Clayey SILT
NUMBER	09-20329-B	**NUMBER**	D4S-3
DATE	3/27/2014	**Location**	Borrow Pit #3
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	96.00%
Height (in)	5.621	87	83.5	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	27.40%	29.40%	2.55

Confining Pressure (psi)	54.30
Top Burette Pressure (psi)	51.27
Base Burette Pressure (psi)	41.32

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	4.600E-08

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Yellow Brown Fine Silty Clayey SAND
NUMBER	09-20329-B	**NUMBER**	D4S-4
DATE	3/27/2014	**Location**	Borrow Pit #4
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.80%
Height (in)	5.621	119.3	114.3	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	12.20%	14.20%	2.6

Confining Pressure (psi)	53.38
Top Burette Pressure (psi)	49.96
Base Burette Pressure (psi)	39.57

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	4.500E-08

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Tan Brown Fine SILT with Clay
NUMBER	09-20329-B	**NUMBER**	D4S-5
DATE	3/27/2014	**Location**	Borrow Pit #5
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	94.60%
Height (in)	5.621	97.7	92.4	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	21.70%	23.70%	2.65

Confining Pressure (psi)	54.10
Top Burette Pressure (psi)	51.05
Base Burette Pressure (psi)	41.89

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	4.500E-08

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Tan Brown Fine Silty SAND with Clay
NUMBER	09-20329-B	**NUMBER**	D4S-6
DATE	3/27/2014	**Location**	Borrow Pit #6
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.60%
Height (in)	5.621	111.7	106.7	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	14.70%	16.70%	2.55

Confining Pressure (psi)	43.56
Top Burette Pressure (psi)	40.11
Base Burette Pressure (psi)	35.08

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	1.400E-07

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Tan Brown Fine Silty SAND with Clay
NUMBER	09-20329-B	**NUMBER**	D4S-7
DATE	3/27/2014	**Location**	Borrow Pit #7
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.80%
Height (in)	5.621	125.1	119.9	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	11.00%	13.00%	2.65

Confining Pressure (psi)	53.55
Top Burette Pressure (psi)	49.99
Base Burette Pressure (psi)	39.76

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	4.800E-08

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Green Tan Fine Silty SAND
NUMBER	09-20329-B	**NUMBER**	D4S-8
DATE	3/27/2014	**Location**	Borrow Pit #8
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.20%
Height (in)	5.621	109.5	104.3	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	15.90%	17.90%	2.6

Confining Pressure (psi)	40.59
Top Burette Pressure (psi)	35.03
Base Burette Pressure (psi)	30.09

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	3.000E-06

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	White Tan Brown Fine Silty SAND
NUMBER	09-20329-B	**NUMBER**	D4S-9
DATE	3/27/2014	**Location**	Borrow Pit #9
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.30%
Height (in)	5.621	114.6	109.3	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	12.70%	14.70%	2.55

Confining Pressure (psi)	42.98
Top Burette Pressure (psi)	40.04
Base Burette Pressure (psi)	35.04

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	7.800E-07

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Tan Brown Fine Sandy SILT
NUMBER	09-20329-B	**NUMBER**	D4S-10
DATE	3/27/2014	**Location**	Borrow Pit #10
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	94.70%
Height (in)	5.621	112.6	106.7	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	15.10%	17.10%	2.65

Confining Pressure (psi)	53.20
Top Burette Pressure (psi)	49.72
Base Burette Pressure (psi)	40.23

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	2.600E-06

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Green Tan Fine Sandy SILT with Clay
NUMBER	09-20329-B	**NUMBER**	D4S-11
DATE	3/27/2014	**Location**	Borrow Pit #11
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	95.00%
Height (in)	5.621	93.9	89.2	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	21.90%	23.90%	2.55

Confining Pressure (psi)	55.02
Top Burette Pressure (psi)	50.08
Base Burette Pressure (psi)	40.21

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	8.000E-06

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

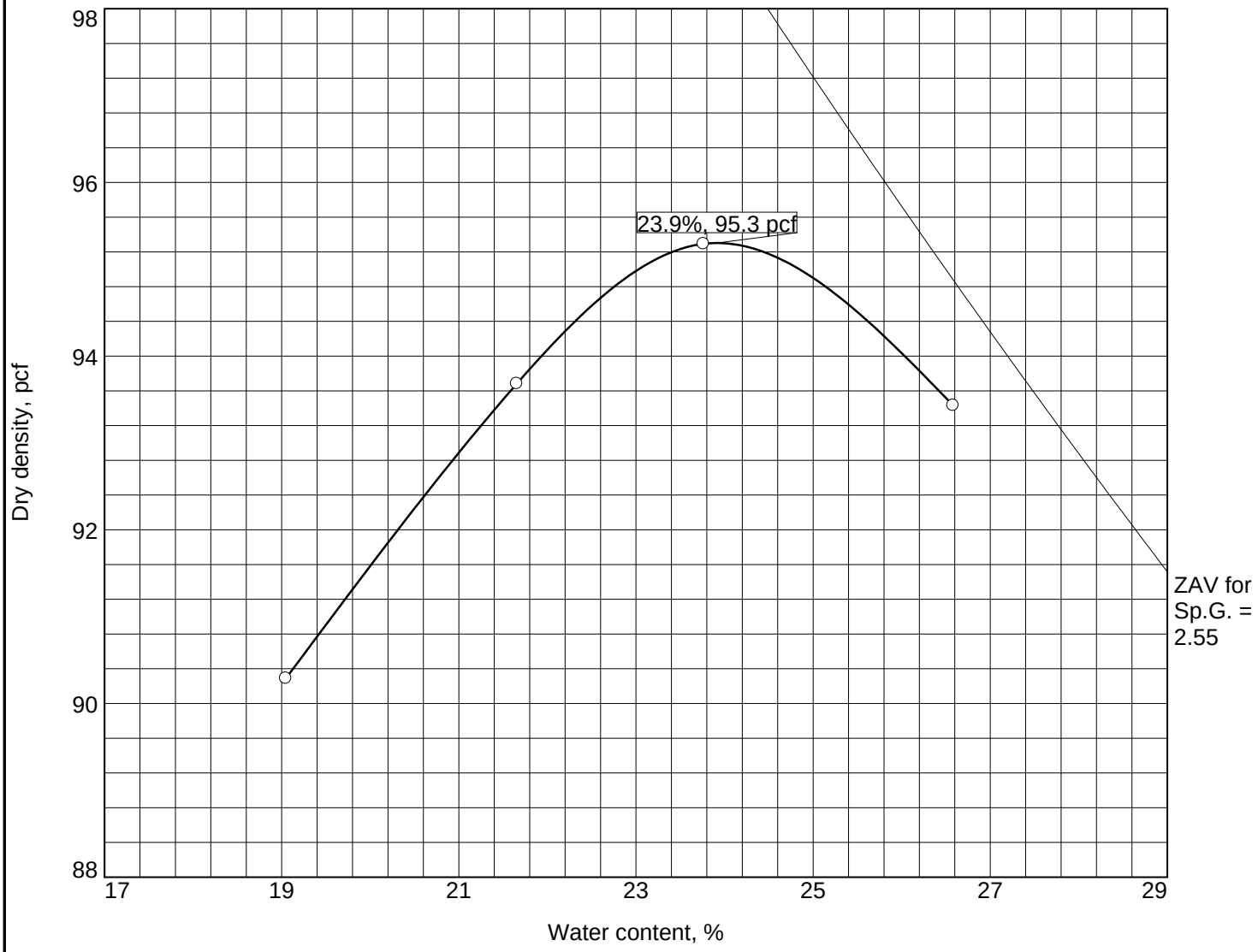
JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Light Tan Brown Fine Clayey SAND with Silt
NUMBER	09-20329-B	**NUMBER**	D4S-12
DATE	3/27/2014	**Location**	Borrow Pit #12
ENGINEER	A Gaylord	**DEPTH**	1.0' - 4.0'

Sample Dimensions		Proctor Values	Remolded Values	Percent Compaction
Diameter (in)	2.817	Max Dry ρ (lb/ft³)	Dry ρ (lb/ft³)	96.20%
Height (in)	5.621	108.8	104.6	**Specific Gravity**
Area (in²)	6.233	Optimum Moisture %	Optimum Moisture %	
Volume (ft³)	0.020	15.80%	17.80%	2.55

Confining Pressure (psi)	52.90
Top Burette Pressure (psi)	49.87
Base Burette Pressure (psi)	39.94

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	4.200E-05

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	MH	A-7-5(14)	32.7	2.55	55	22	0.0	64.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 95.3 pcf Optimum moisture = 23.9 %	Red Orange Fine Sandy SILT

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #1 **Sample Number:** D4S-1

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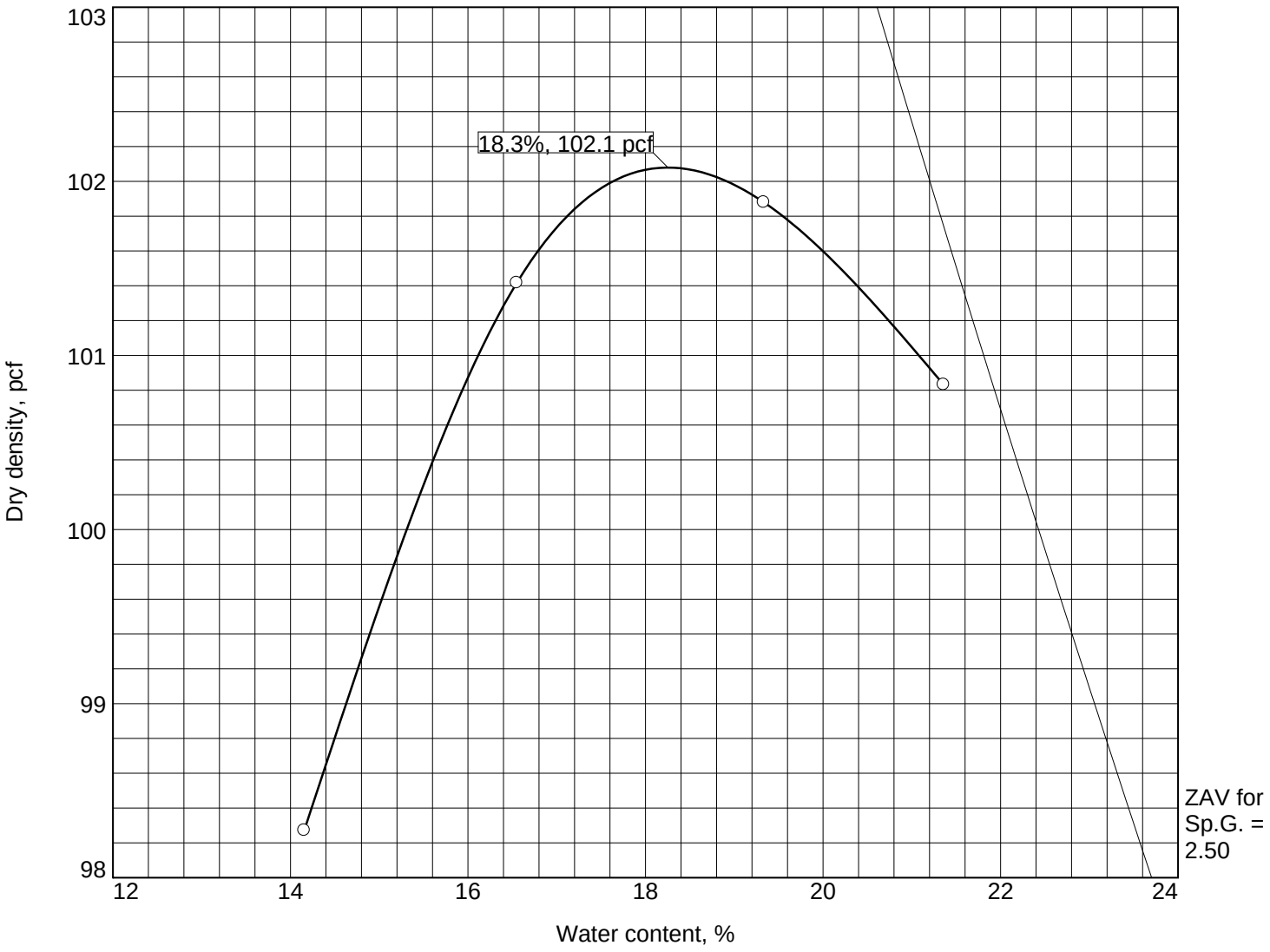

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--5.00	SM	A-7-6(2)	23.7	2.50	43	14	13.7	37.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 102.1 pcf Optimum moisture = 18.3 %	Yellow Brown Fine Silty Clayey SAND

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #2 **Sample Number:** D4S-2

Remarks:

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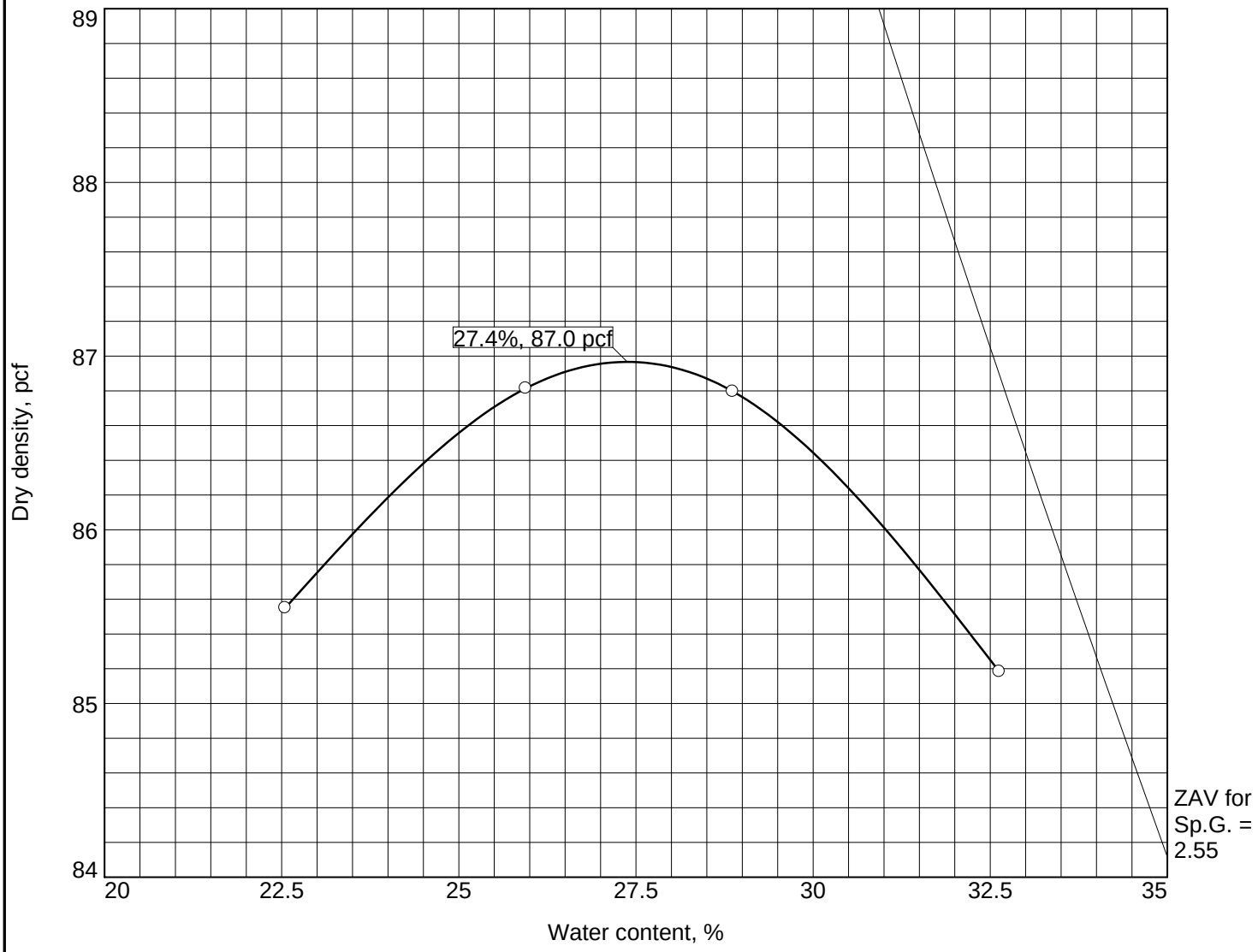

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	MH	A-7-5(28)	28.5	2.55	59	24	0.0	91.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 87.0 pcf Optimum moisture = 27.4 %	Yellow Brown Fine Sandy Clayey SILT

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #3 **Sample Number:** D4S-3

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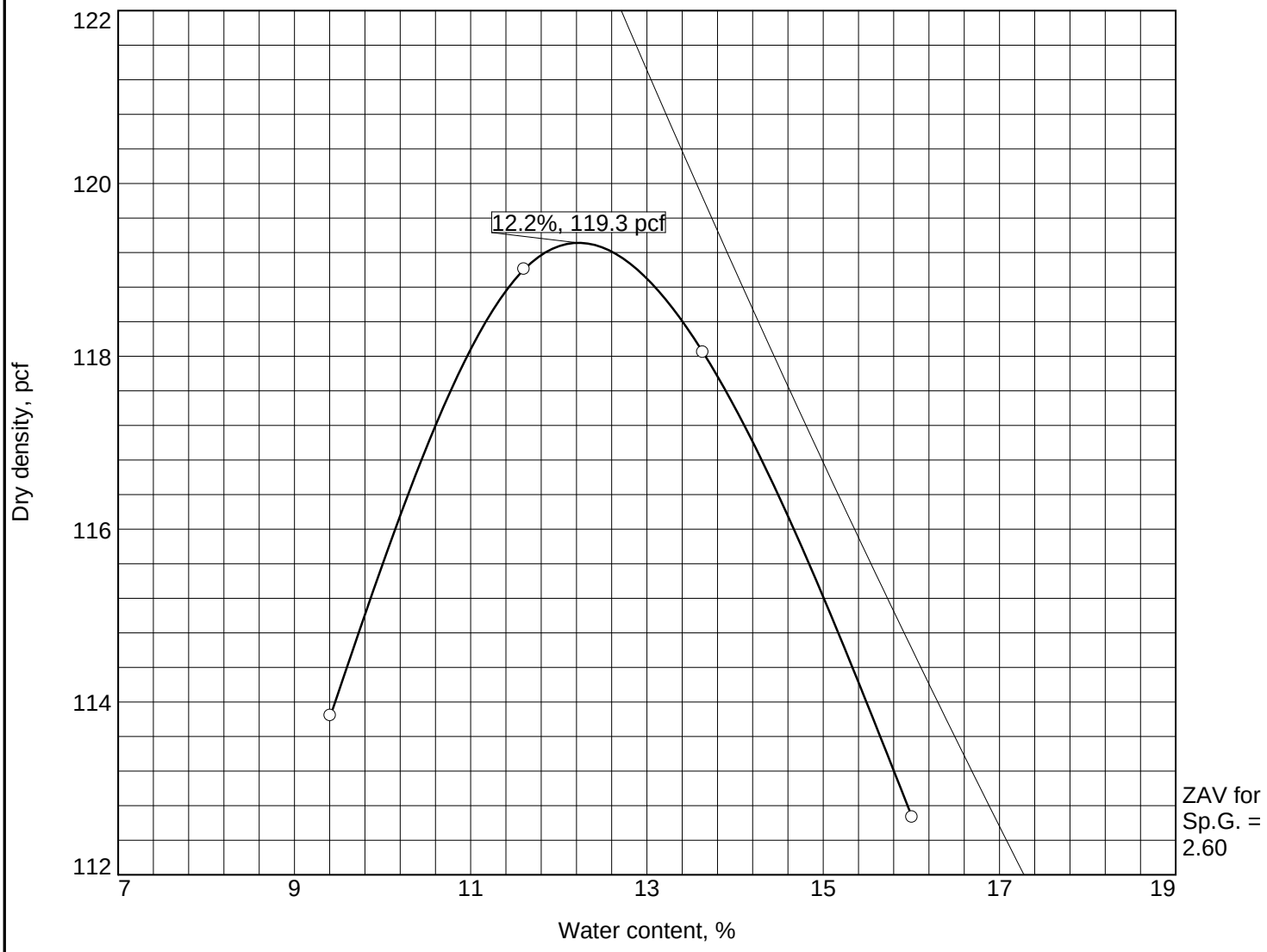

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	SC	A-6(3)	16.1	2.60	31	14	0.4	48.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 119.3 pcf Optimum moisture = 12.2 %	Yellow Brown Fine Silty Clayey SAND

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #4 **Sample Number:** D4S-4

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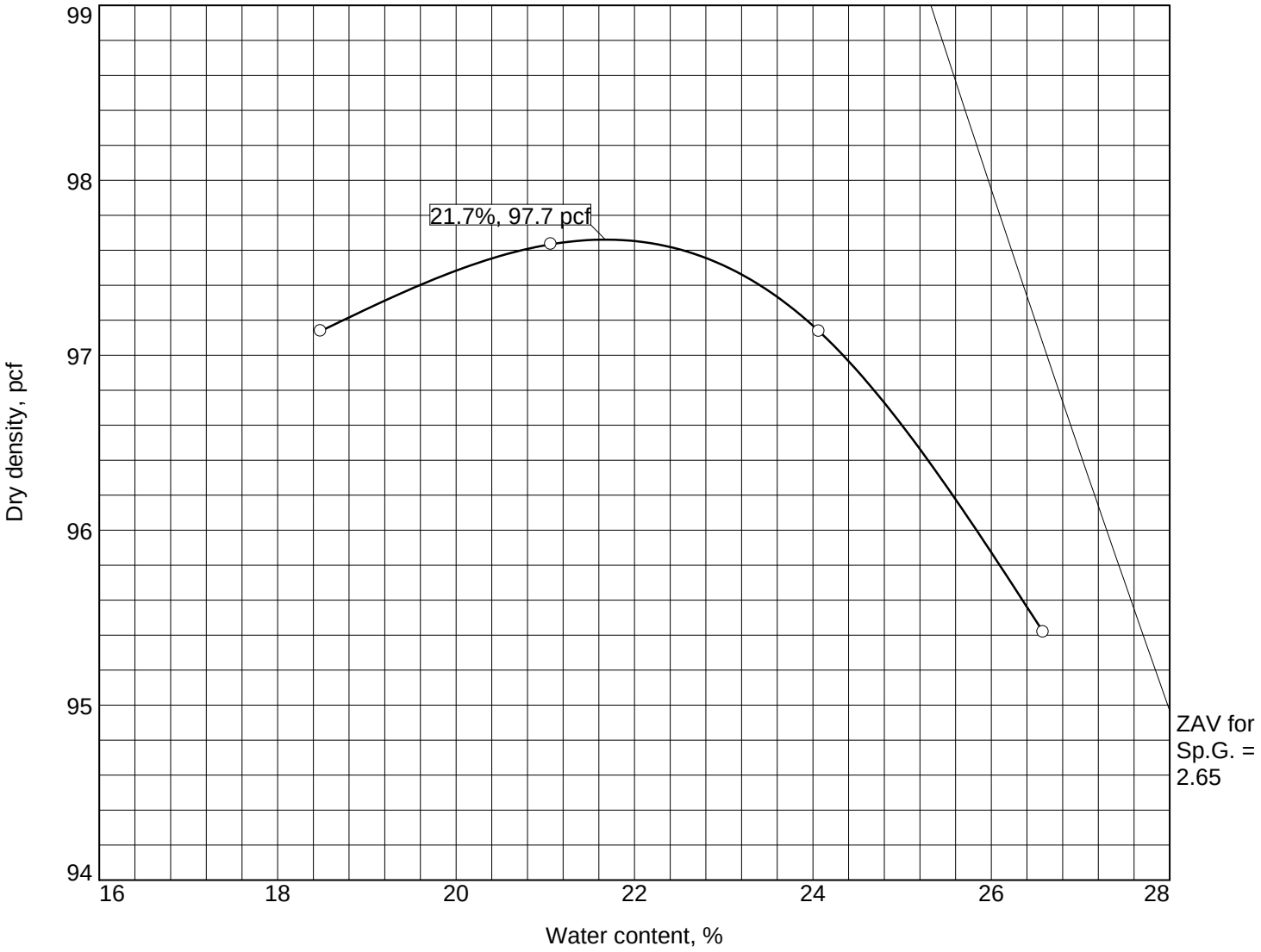

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	ML	A-7-5(7)	30.0	2.65	42	11	3.5	63.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 97.7 pcf Optimum moisture = 21.7 %	Tan Brown Fine Sandy SILT with Clay

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #5 **Sample Number:** D4S-5

Remarks:

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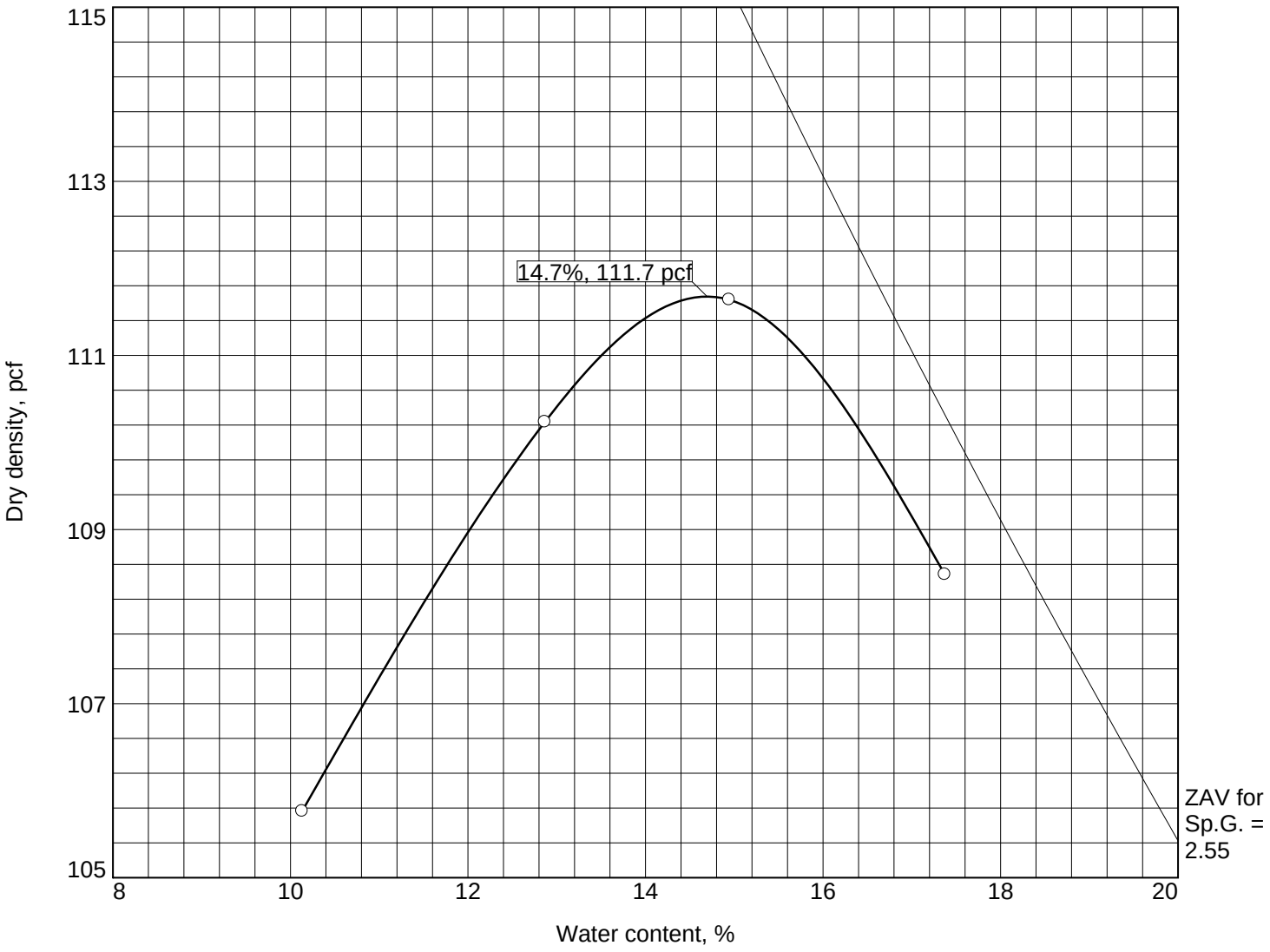

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	SC	A-6(3)	20.5	2.55	38	13	0.1	44.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111.7 pcf Optimum moisture = 14.7 %	Tan Brown Fine Silty SAND with CLAY

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #6 **Sample Number:** D4S-6

Remarks:

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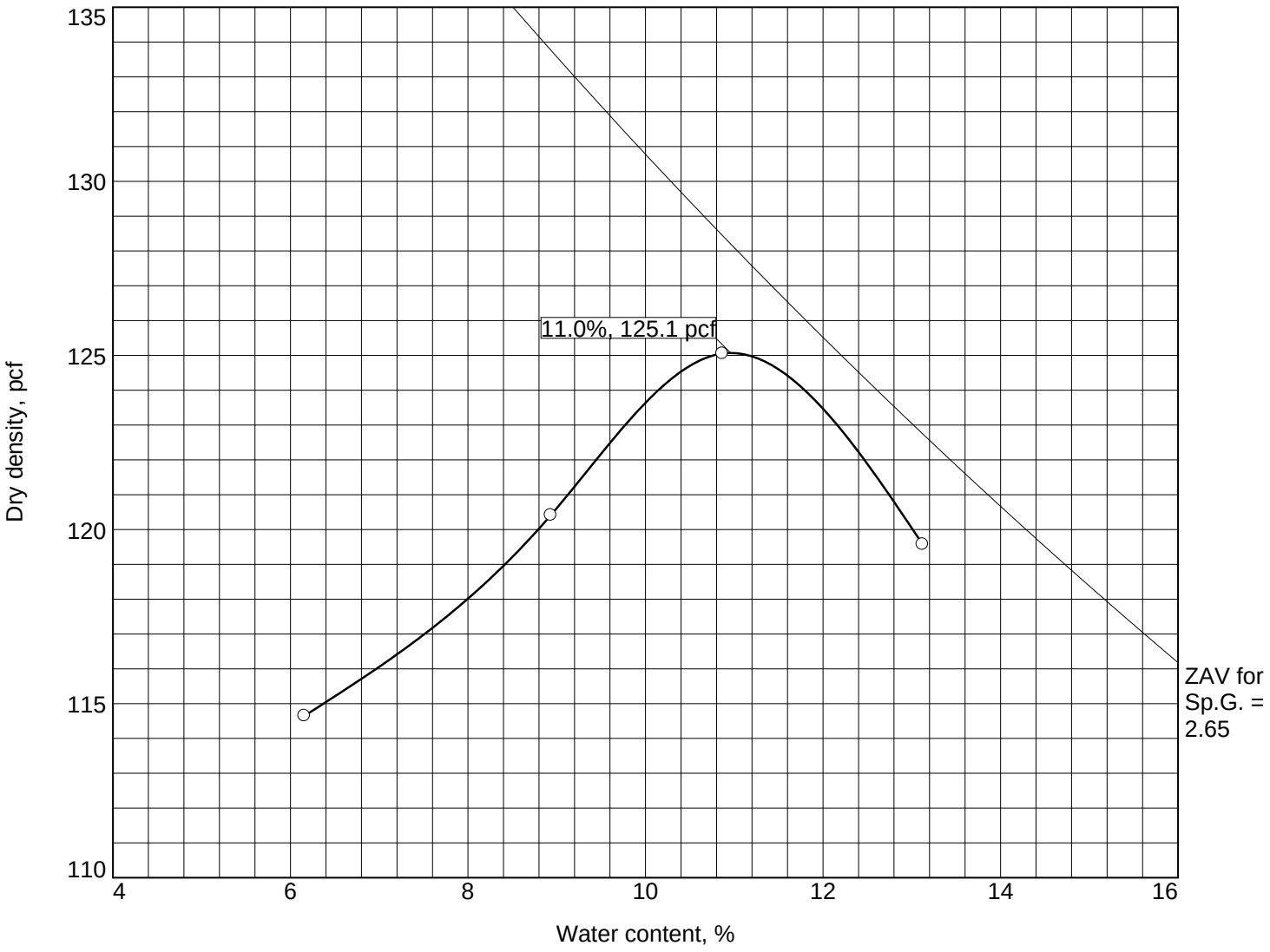

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	SC	A-4(1)	14.3	2.65	24	9	1.9	42.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 125.1 pcf Optimum moisture = 11.0 %	Tan Brown Fine Silty SAND with CLAY

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #7 **Sample Number:** D4S-7

Remarks:

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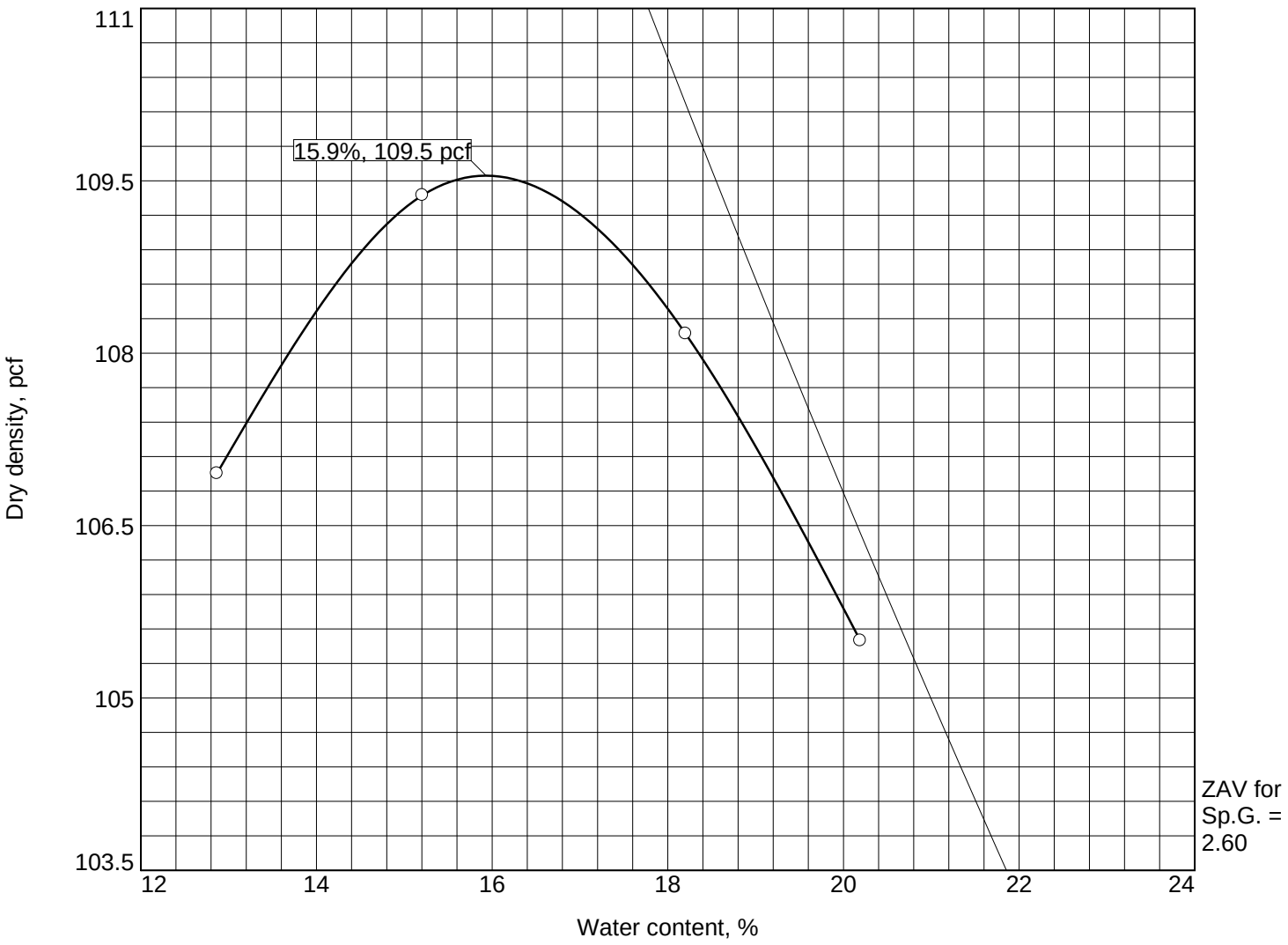

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	SM	A-4(2)	20.9	2.60	36	7	0.6	48.6

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 109.5 pcf Optimum moisture = 15.9 %	Green Tan Fine Silty SAND

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #8 **Sample Number:** D4S-8

Remarks:

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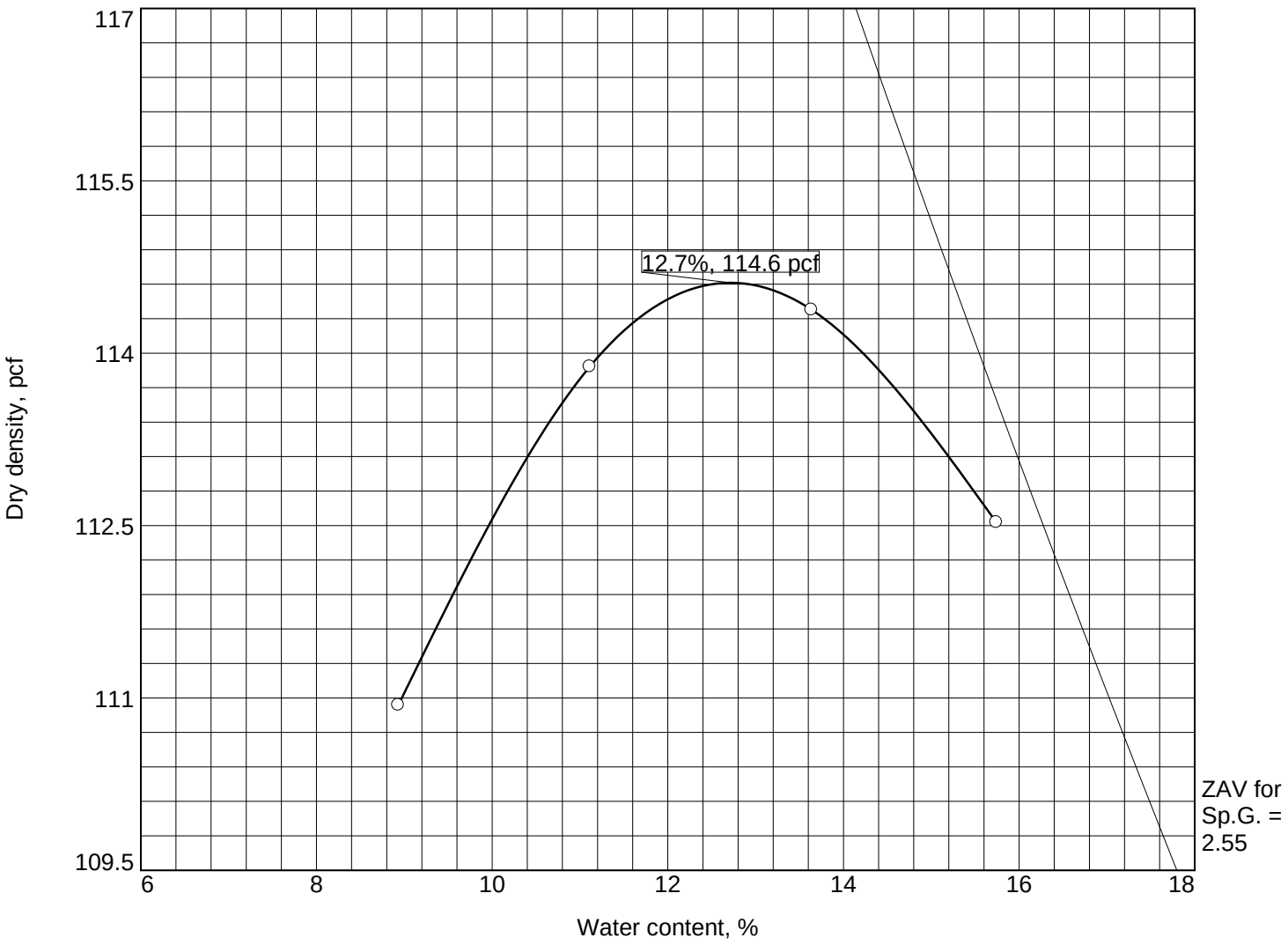

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	SM	A-2-4(0)	16.3	2.55	30	3	0.0	28.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 114.6 pcf Optimum moisture = 12.7 %	White Tan Brown Fine Silty SAND

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #9 **Sample Number:** D4S-9

Remarks:

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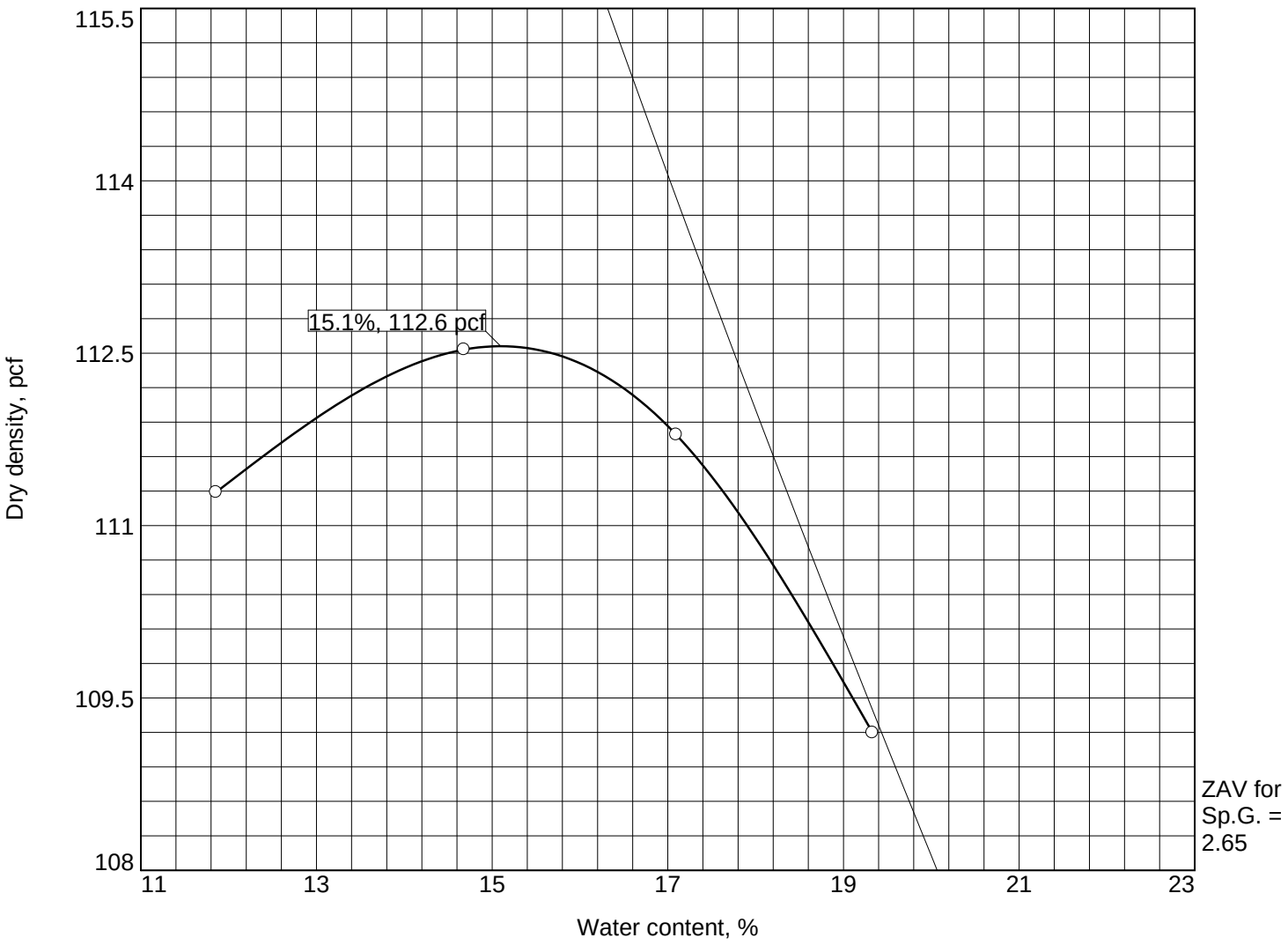

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--5.00	ML	A-4(4)	19.9	2.65	37	7	0.2	64.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112.6 pcf Optimum moisture = 15.1 %	Tan Brown Fine Sandy SILT

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #10 **Sample Number:** D4S-10

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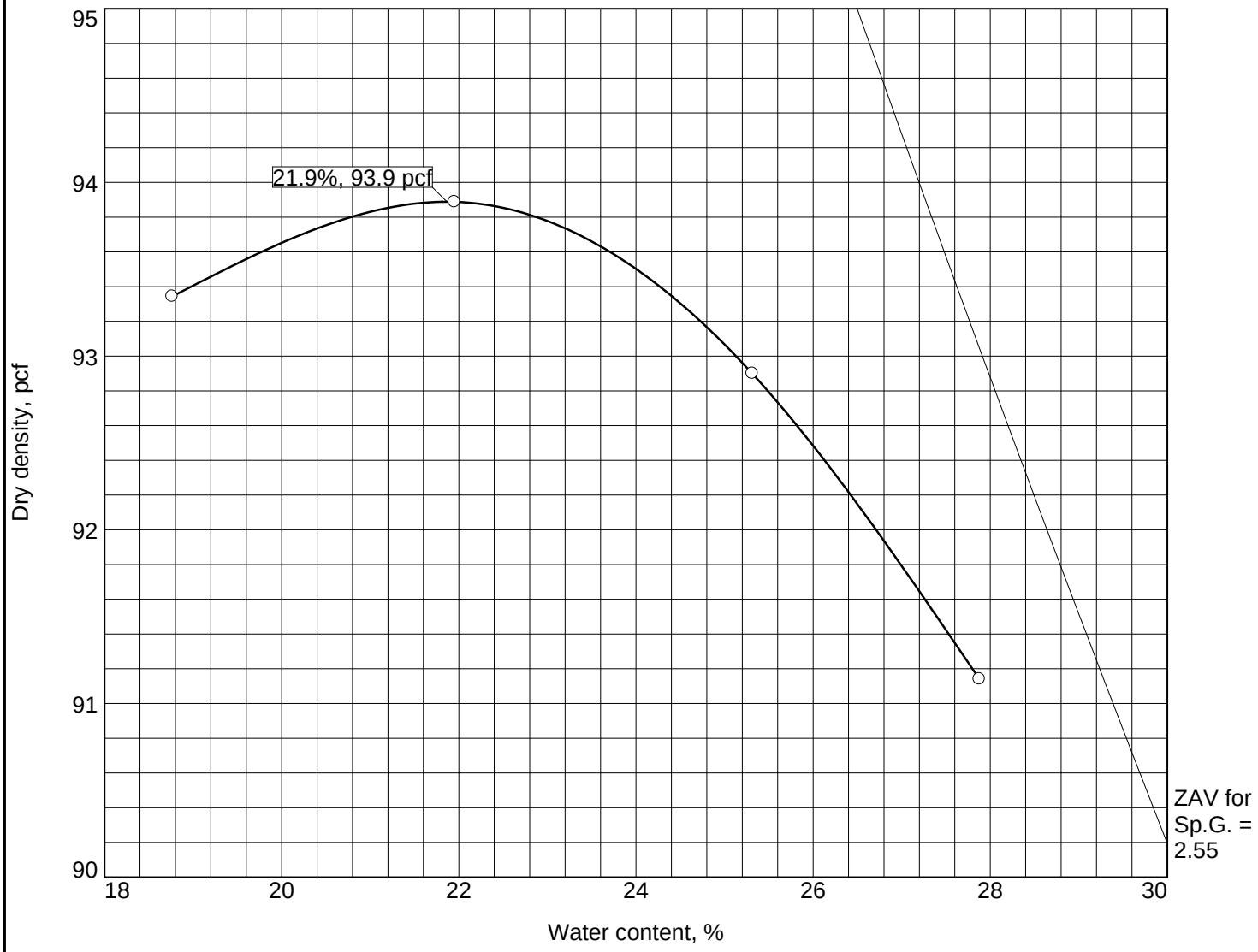
Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--4.00	ML	A-7-5(12)	34.0	2.55	46	14	0.6	77.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 93.9 pcf Optimum moisture = 21.9 %	Green Tan Fine Sandy SILT with CLAY

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #11 **Sample Number:** D4S-11

Remarks:

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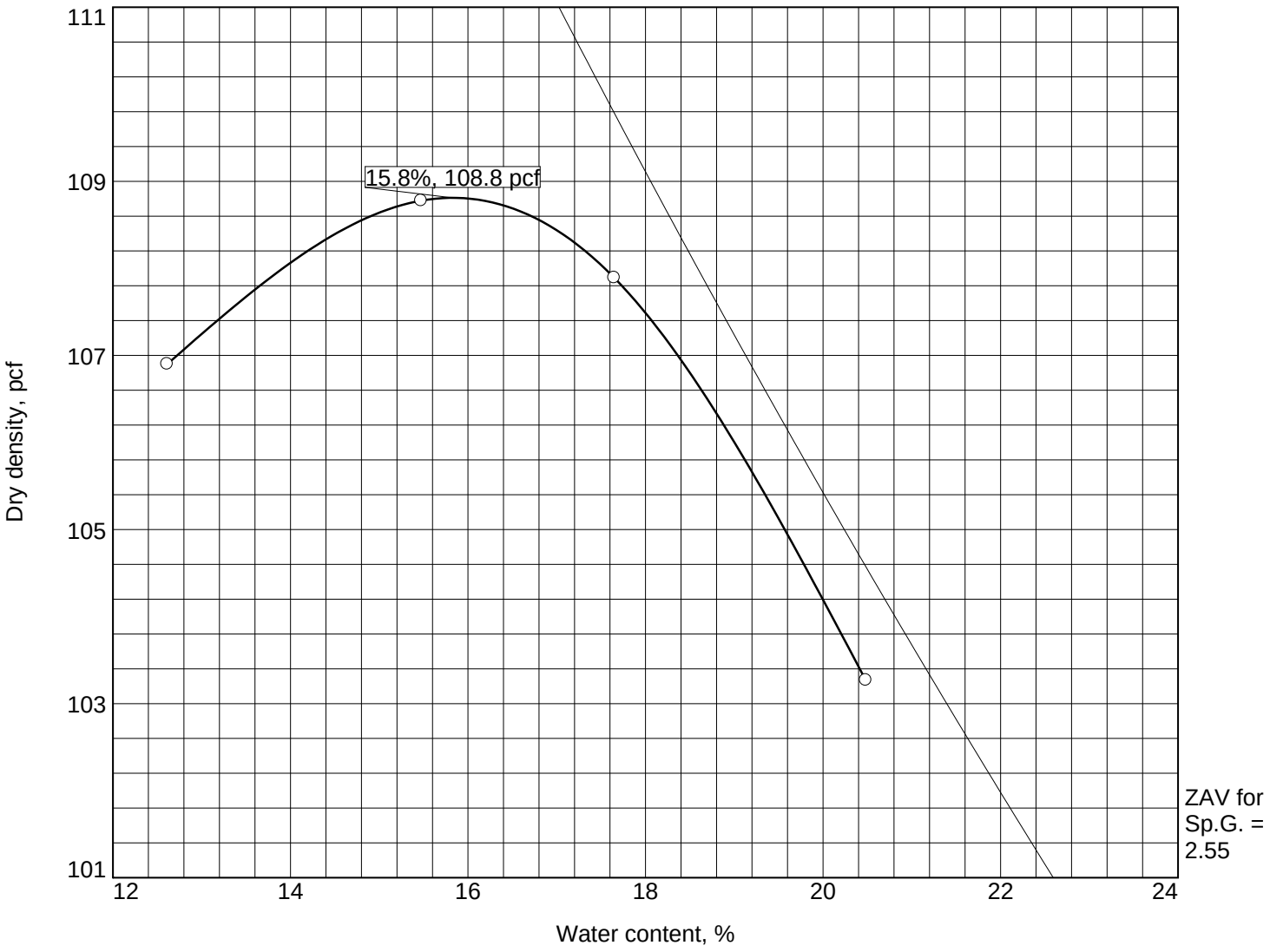
Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00--5.00	SC	A-2-6(1)	18.4	2.55	40	15	0.3	31.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.8 pcf Optimum moisture = 15.8 %	Light Tan Brown Fine Clayey SAND with Silt

Project No. 20329-B **Client:** Triangle Grading and Paving, Inc.

Project: White Street - Landfill

Date:

○ **Source of Sample:** BORROW PIT #12 **Sample Number:** D4S-12

Remarks:

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Figure

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A4

Hydraulic Conductivity

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Off-Site Borrow
Test Pad

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill Phase II	**DESCRIPTION**	Tan Brown Medium Sandy Silty CLAY
NUMBER	09.20329-A	**NUMBER**	1
DATE	6/7/2014	**BORING**	Shelby Tube
ENGINEER	S Breza	**DEPTH**	Lift 1

Sample Dimensions		Shelby Tube Values	Shelby Tube Values
Diameter (in)	2.833	Wet (lb/ft³)	Dry (lb/ft³)
Height (in)	4.258	126.9	104.0
Area (in²)	6.304	Moisture %	Specific Gravity
Volume (ft³)	0.016	17.20%	2.60

Confining Pressure (psi)	52.00
Top Burette Pressure (psi)	44.80
Base Burette Pressure (psi)	49.80

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	1.100E-07

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill Phase II	**DESCRIPTION**	Tan Brown Medium Sandy Silty CLAY
NUMBER	09.20329-A	**NUMBER**	2
DATE	6/7/2014	**BORING**	Shelby Tube
ENGINEER	S Breza	**DEPTH**	Lift 2

Sample Dimensions		Shelby Tube Values	Shelby Tube Values
Diameter (in)	2.855	Wet (lb/ft³)	Dry (lb/ft³)
Height (in)	3.735	131.3	114.4
Area (in²)	6.402	Moisture %	Specific Gravity
Volume (ft³)	0.014	14.80%	2.60

Confining Pressure (psi)	51.54
Top Burette Pressure (psi)	44.82
Base Burette Pressure (psi)	49.83

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	2.700E-08

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill Phase II	**DESCRIPTION**	Tan Brown Medium Sandy Silty CLAY
NUMBER	09.20329-A	**NUMBER**	3
DATE	6/7/2014	**BORING**	Shelby Tube
ENGINEER	S Breza	**DEPTH**	Lift 3

Sample Dimensions		Shelby Tube Values	Shelby Tube Values
Diameter (in)	2.860	Wet (lb/ft³)	Dry (lb/ft³)
Height (in)	4.288	126.9	109.5
Area (in²)	6.424	Moisture %	Specific Gravity
Volume (ft³)	0.016	15.80%	2.60

Confining Pressure (psi)	51.40
Top Burette Pressure (psi)	44.93
Base Burette Pressure (psi)	49.92

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	3.300E-08

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Brown Tan Clayey Sandy SILT
NUMBER	09-20329-A	**NUMBER**	1
DATE	7/29/2014	**Boring**	Shelby Tube
ENGINEER	D Cutter	**Lift**	Lift 1 Grid #13

Sample Dimensions

Diameter (in)	2.384
Height (in)	4.738
Area (in²)	4.464
Volume (ft³)	0.012

Confining Pressure (psi)	58.36
Top Burette Pressure (psi)	50.00
Base Burette Pressure (psi)	55.29

Permeant Liquid	Gradient Range (psi)	draulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	3.900E-07

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Brown Tan Clayey Sandy SILT
NUMBER	09-20329-A	**NUMBER**	2
DATE	7/29/2014	**Boring**	Shelby Tube
ENGINEER	D Cutter	**Lift**	Lift 2 Grid #13

Sample Dimensions

Diameter (in)	2.386
Height (in)	4.967
Area (in²)	4.471
Volume (ft³)	0.013

Confining Pressure (psi)	58.16
Top Burette Pressure (psi)	49.97
Base Burette Pressure (psi)	55.08

Permeant Liquid	Gradient Range (psi)	draulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	1.000E-06

k formula belongs to ASTM 5084 Method C, when the cross area of the burette where the flow is coming from, is the same area than the burette that is receiving the flow

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Brown Tan Clayey Sandy SILT
NUMBER	09-20329-A	**NUMBER**	3
DATE	8/7/2014	**Boring**	Shelby Tube
ENGINEER	D Cutter	**Lift**	Lift 3 Grid #13

Sample Dimensions

Diameter (in)	2.390	**Confining Pressure (psi)**	58.14
Height (in)	4.940	**Top Burette Pressure (psi)**	50.08
Area (in²)	4.486	**Base Burette Pressure (psi)**	55.10
Volume (ft³)	0.013		

Permeant Liquid	Gradient Range (psi)	draulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	1.400E-06

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Brown Tan Clayey Sandy SILT
NUMBER	09-20329-A	**NUMBER**	1
DATE	8/25/2014	**Boring**	Shelby Tube
ENGINEER	D Cutter	**Lift**	Lift 1 Grid #16

Sample Dimensions

Diameter (in)	2.384
Height (in)	4.821
Area (in²)	4.464
Volume (ft³)	0.012

Confining Pressure (psi)	58.10
Top Burette Pressure (psi)	50.06
Base Burette Pressure (psi)	55.12

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	5.900E-06

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Brown Tan Clayey Sandy SILT
NUMBER	09-20329-A	**NUMBER**	1
DATE	8/25/2014	**Boring**	Shelby Tube
ENGINEER	D Cutter	**Lift**	Lift 2 Grid #16

Sample Dimensions

Diameter (in)	2.384
Height (in)	4.850
Area (in²)	4.464
Volume (ft³)	0.013

Confining Pressure (psi)	58.00
Top Burette Pressure (psi)	50.00
Base Burette Pressure (psi)	55.00

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	4.300E-06

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Measurement of Hydraulic Conductivity ASTM D 5084

JOB INFORMATION		SAMPLE INFORMATION	
NAME	White Street Landfill	**DESCRIPTION**	Brown Tan Clayey Sandy SILT
NUMBER	09-20329-A	**NUMBER**	1
DATE	8/25/2014	**Boring**	Shelby Tube
ENGINEER	D Cutter	**Lift**	Lift 3 Grid #16

Sample Dimensions

Diameter (in)	2.384	**Confining Pressure (psi)**	59.00
Height (in)	4.850	**Top Burette Pressure (psi)**	51.00
Area (in²)	4.464	**Base Burette Pressure (psi)**	56.00
Volume (ft³)	0.013		

Permeant Liquid	Gradient Range (psi)	Average Hydraulic Conductivity (cm/sec)
Distilled Water	1.0 - 3.0	5.100E-06

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A5

Atterberg Limits and Fines Content

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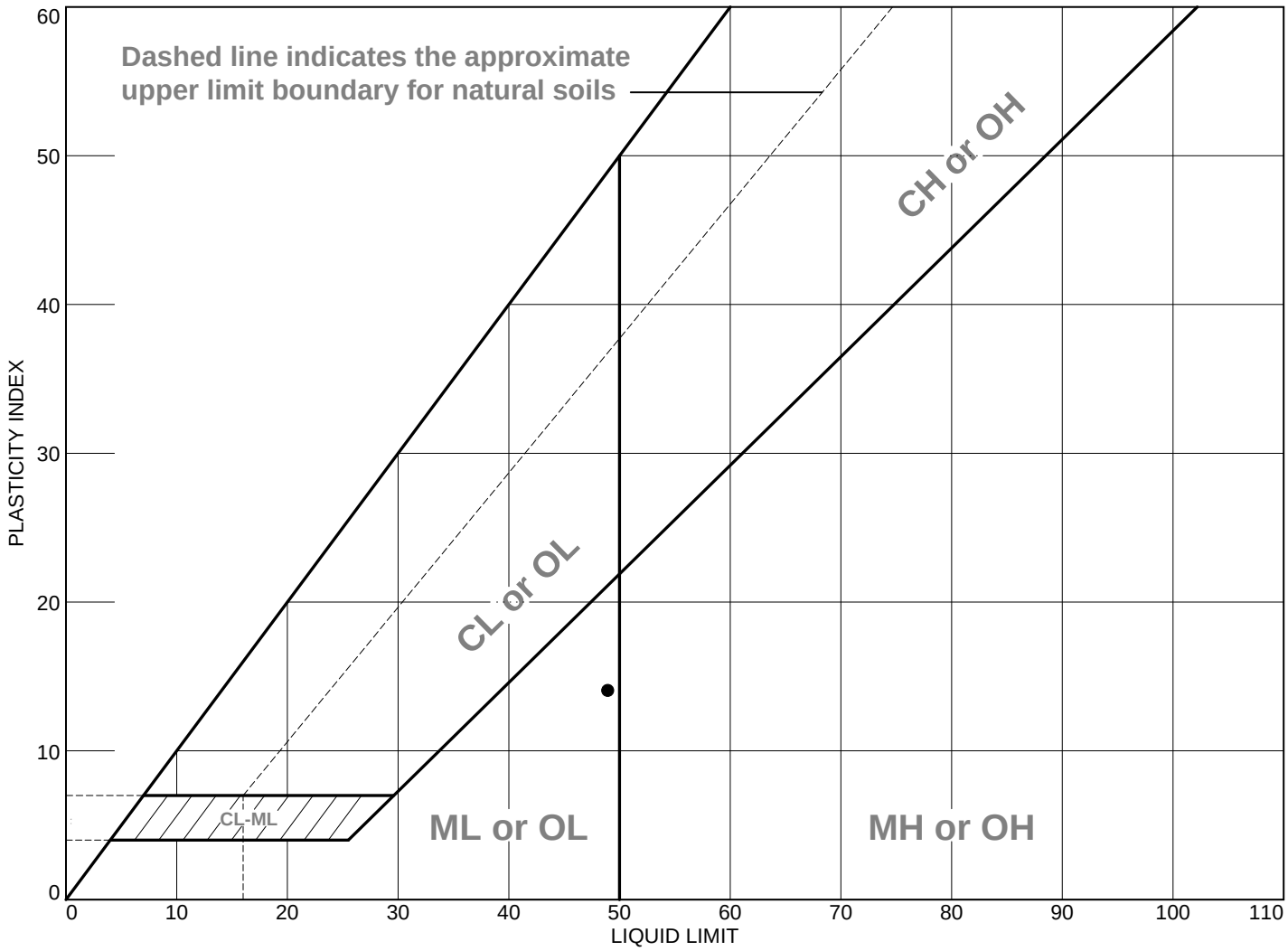
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Red Brown Fine Sandy SILT	49	35	14		68.6	ML

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#4 lift 1 **Depth:** 0.00-0.00 **Sample No.:** D4S-6

Remarks:

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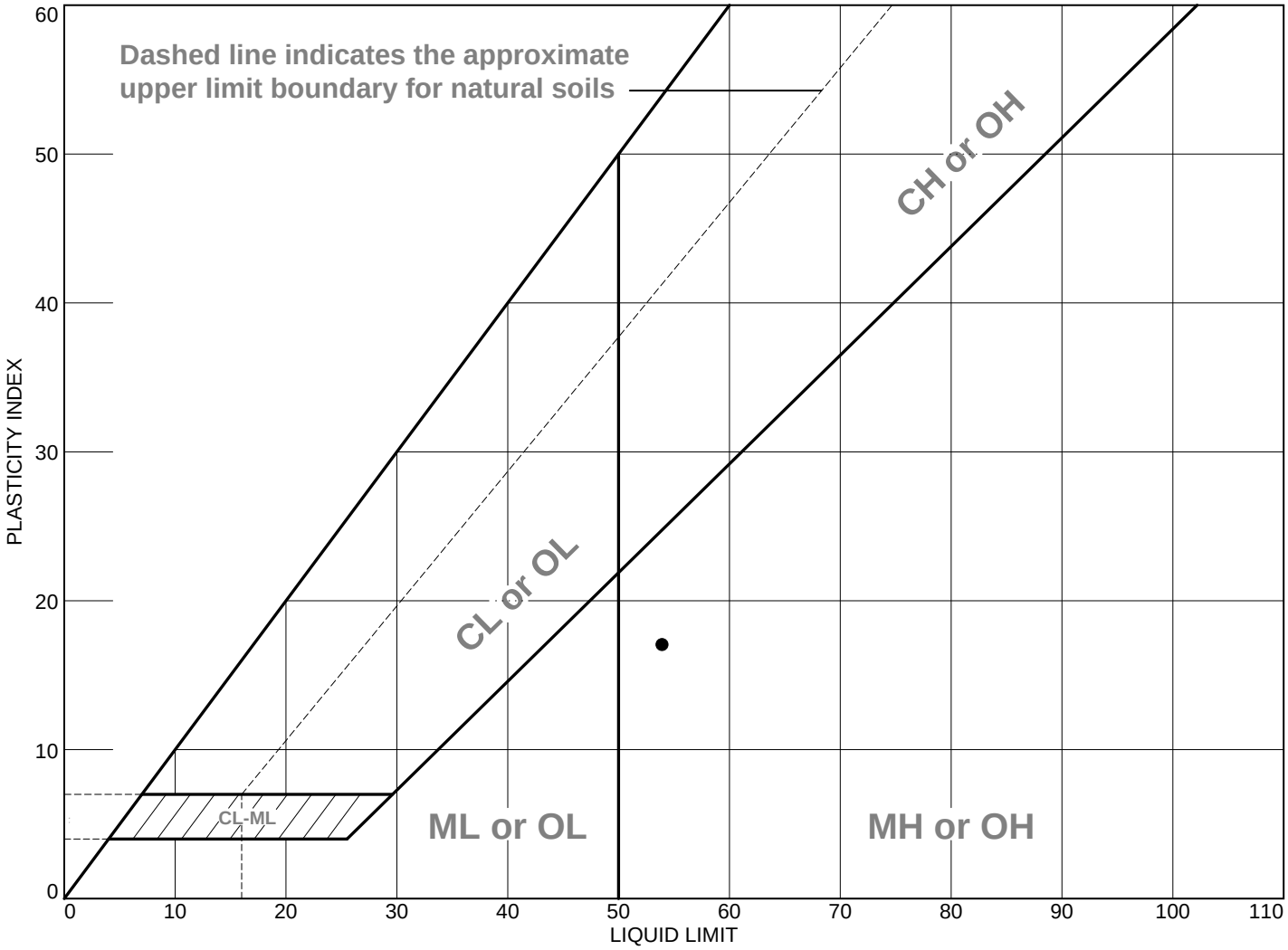
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Red Brown Fine Sandy SILT	54	37	17		77.6	MH

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#4 lift 2 **Depth:** 0.00-0.00 **Sample No.:** D4S-7

Remarks:

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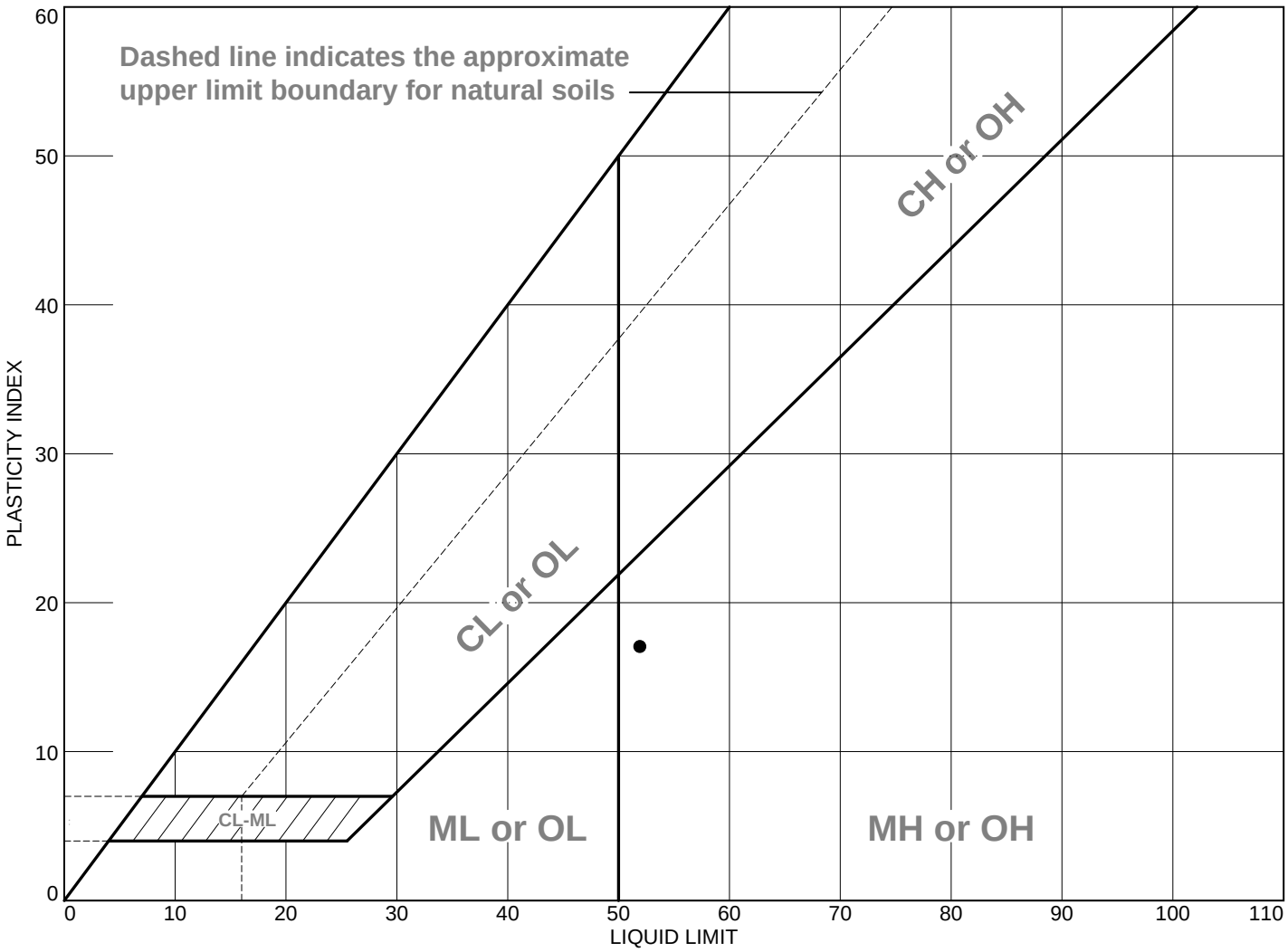
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Red Brown Fine Sandy SILT	52	35	17		76.8	MH

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#4 lift 3 **Depth:** 0.00-0.00 **Sample No.:** D4S-8

Remarks:

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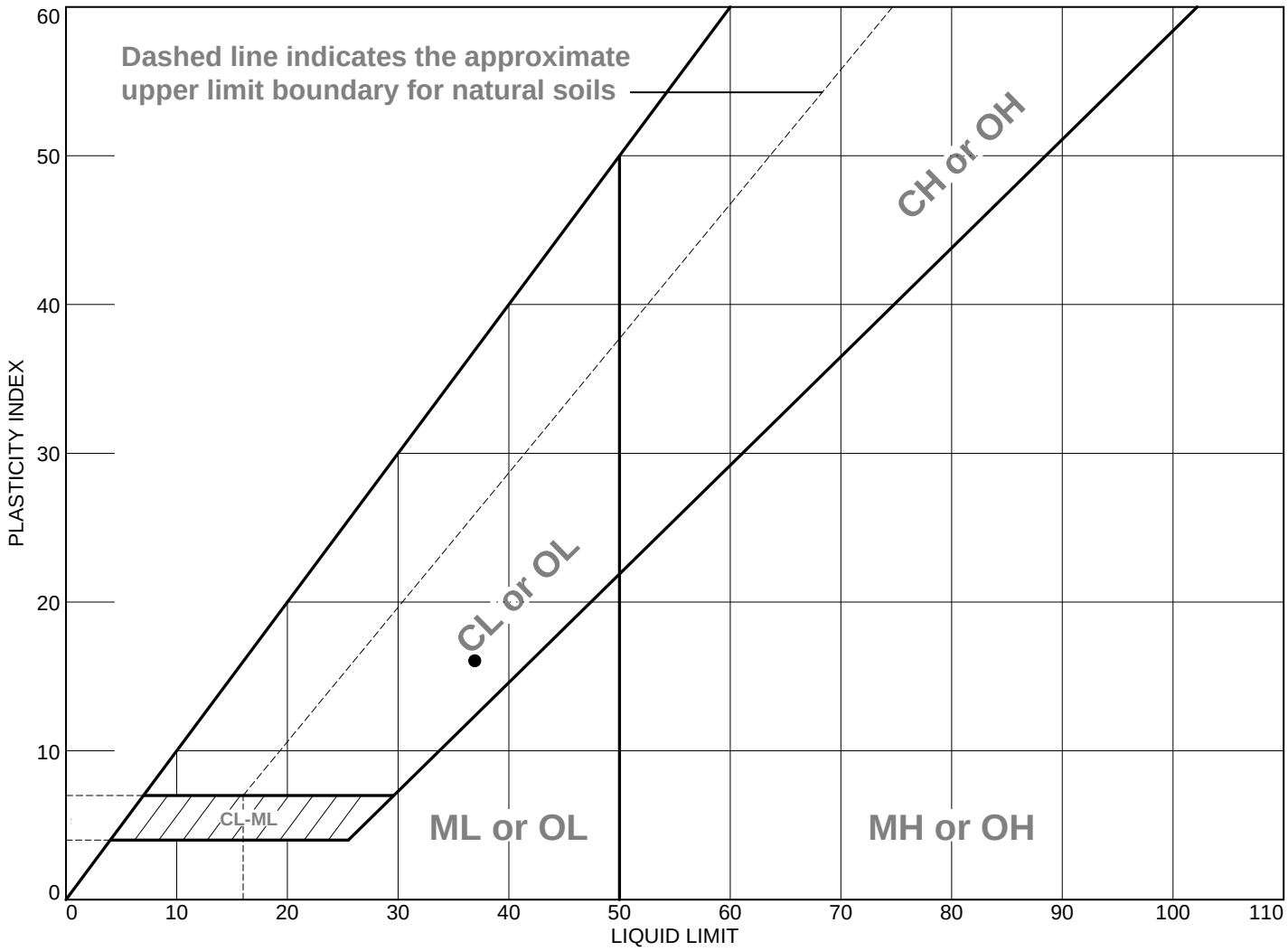
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Silty Fine to Medium Sandy CLAY	37	21	16		52.4	CL

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#5 lift 1 **Depth:** 0.00-0.00 **Sample No.:** D4S-9

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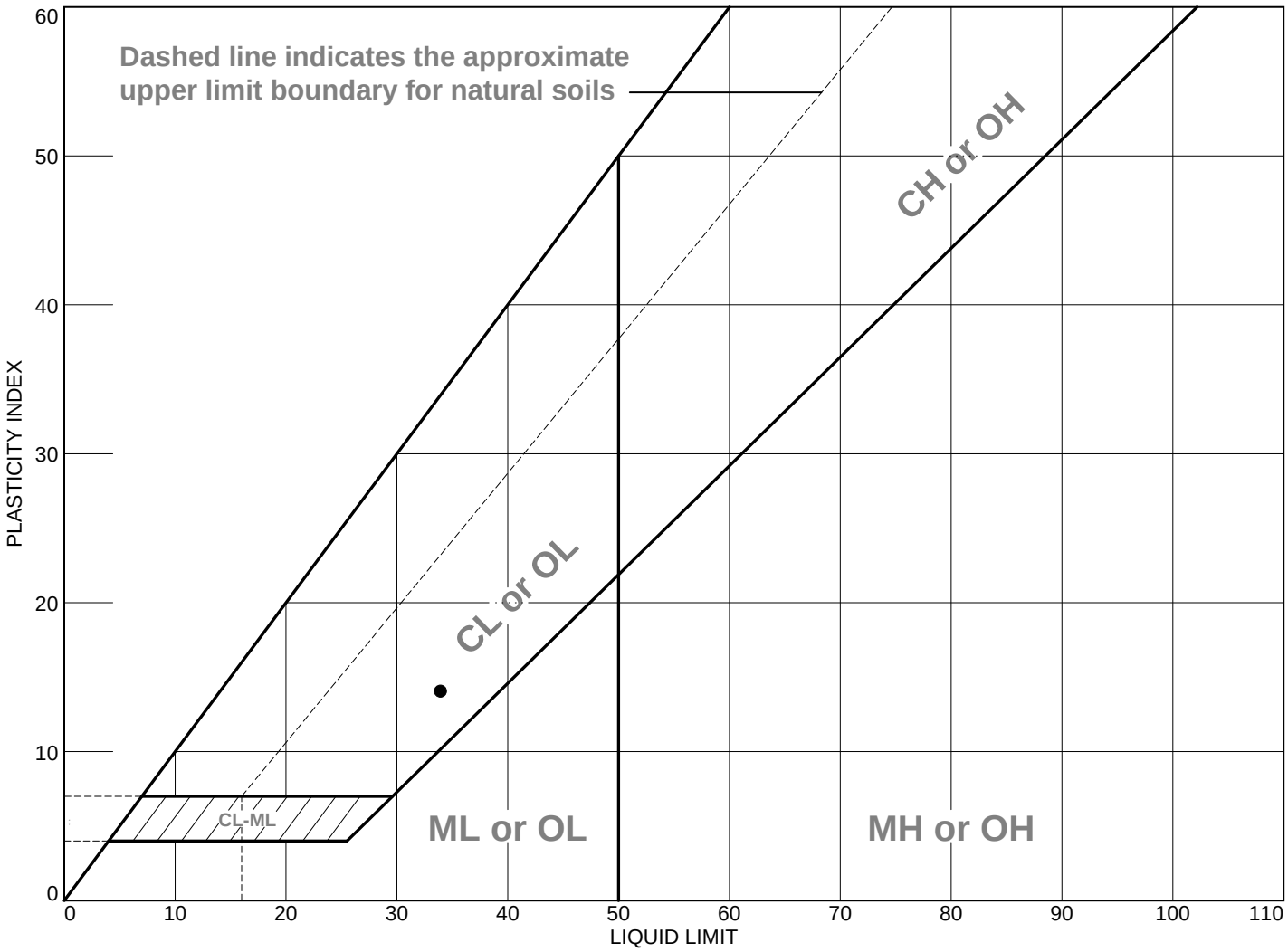
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Fine to Medium Silty Sandy CLAY	34	20	14		48.3	CL

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#5 lift 2 **Depth:** 0.00-0.00 **Sample No.:** D4S-10

Remarks:

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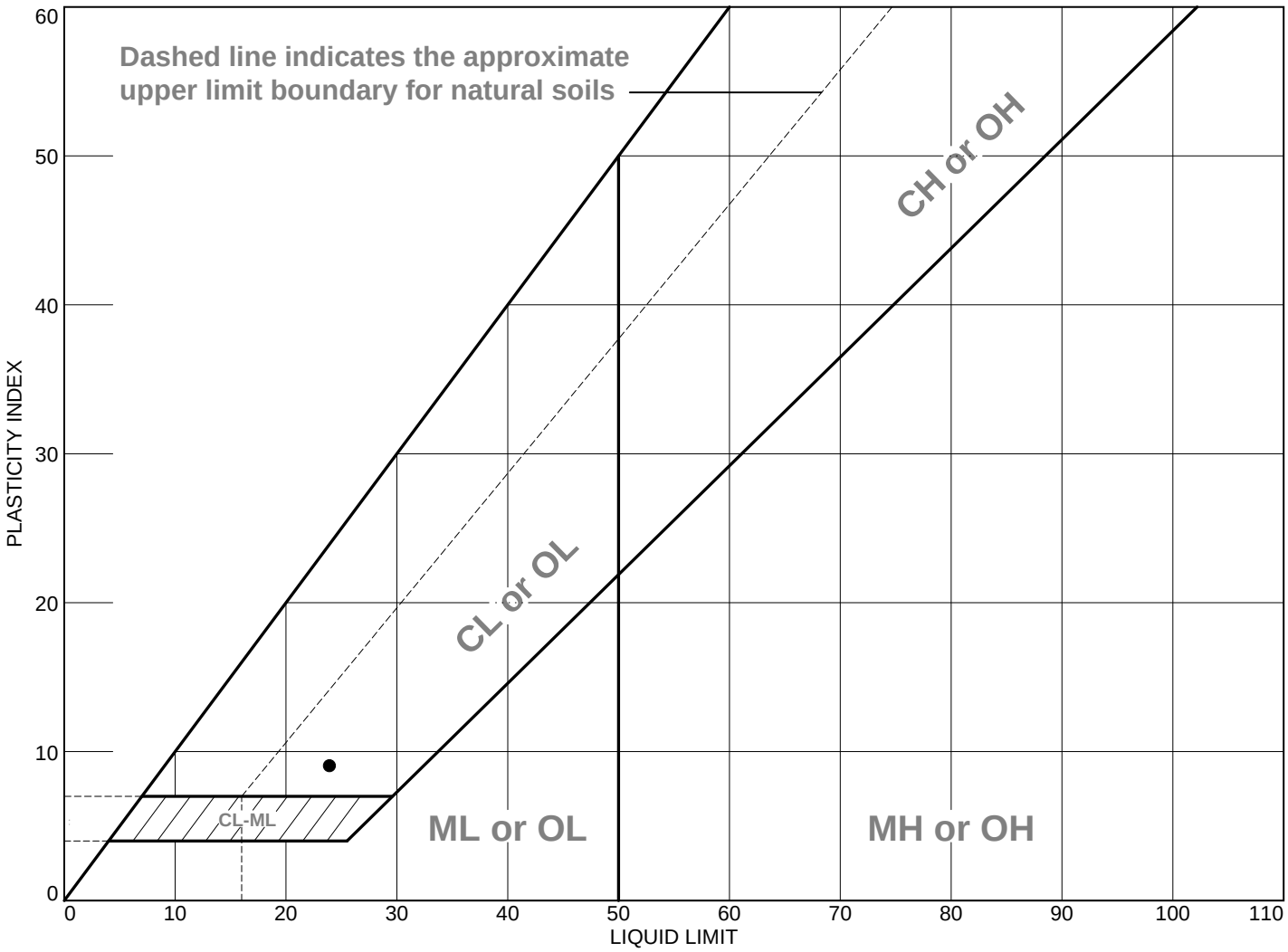
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Silty Fine to Coarse Sandy CLAY	24	15	9		41.7	CL

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#5 lift 3 **Depth:** 0.00-0.00 **Sample No.:** D4S-11

Remarks:

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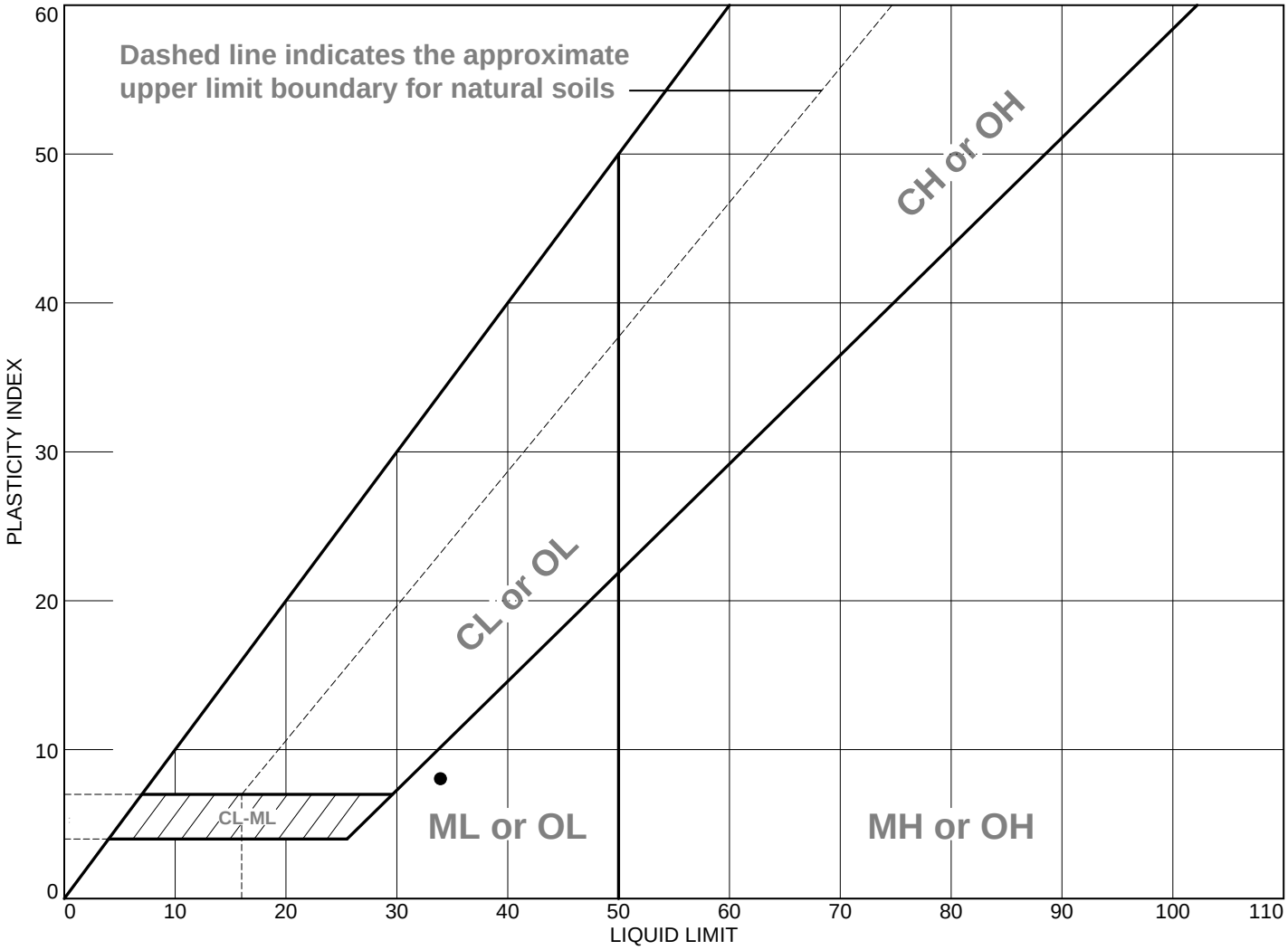
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Brown Silty Fine to Medium SAND	34	26	8		32.8	SM

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#13 lift 1 **Depth:** 0.00-0.00 **Sample No.:** D4S-12

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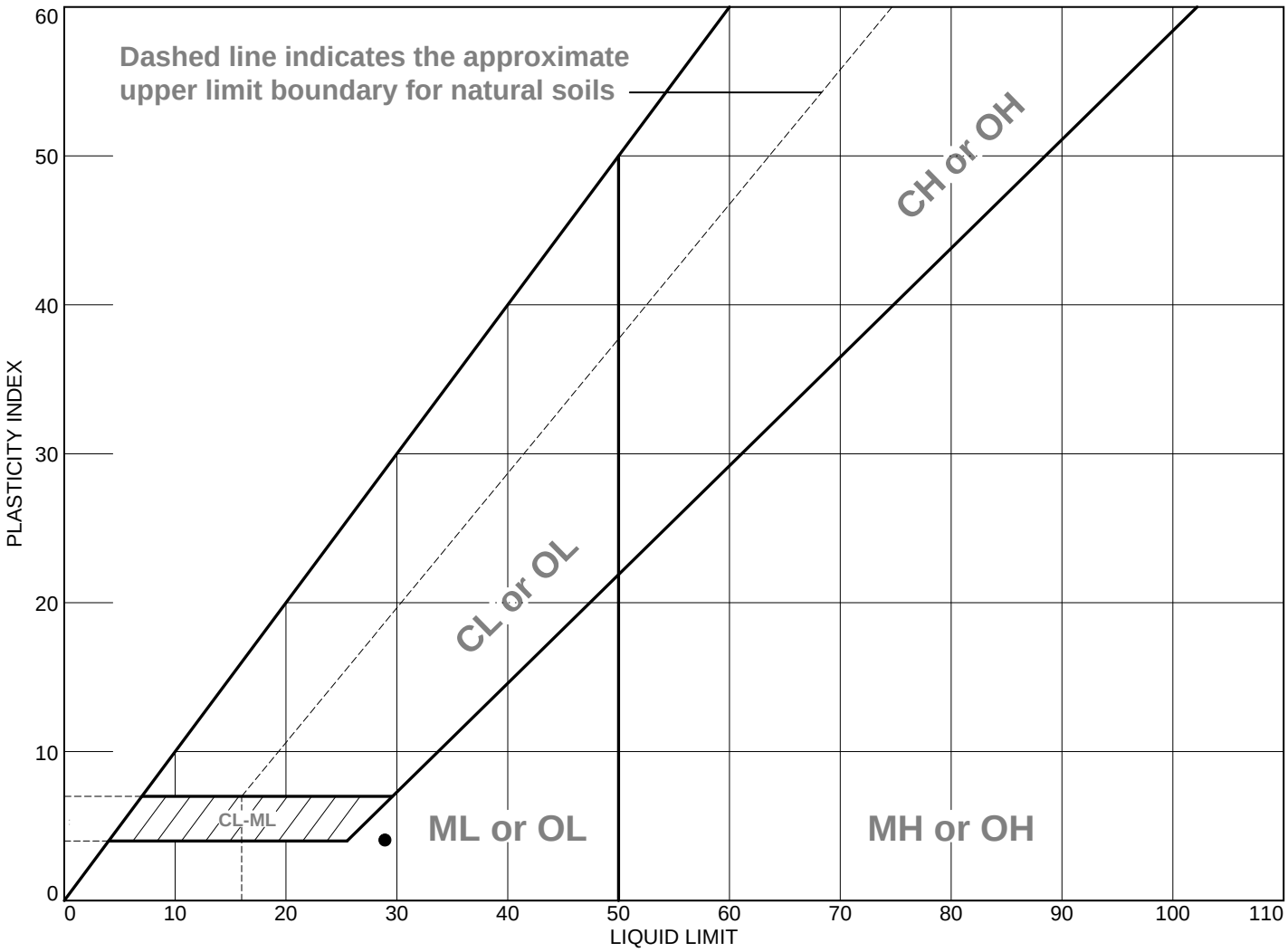
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Silty Fine to Coarse SAND	29	25	4		41.4	SM

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#13 lift 2 **Depth:** 0.00-0.00 **Sample No.:** D4S-13

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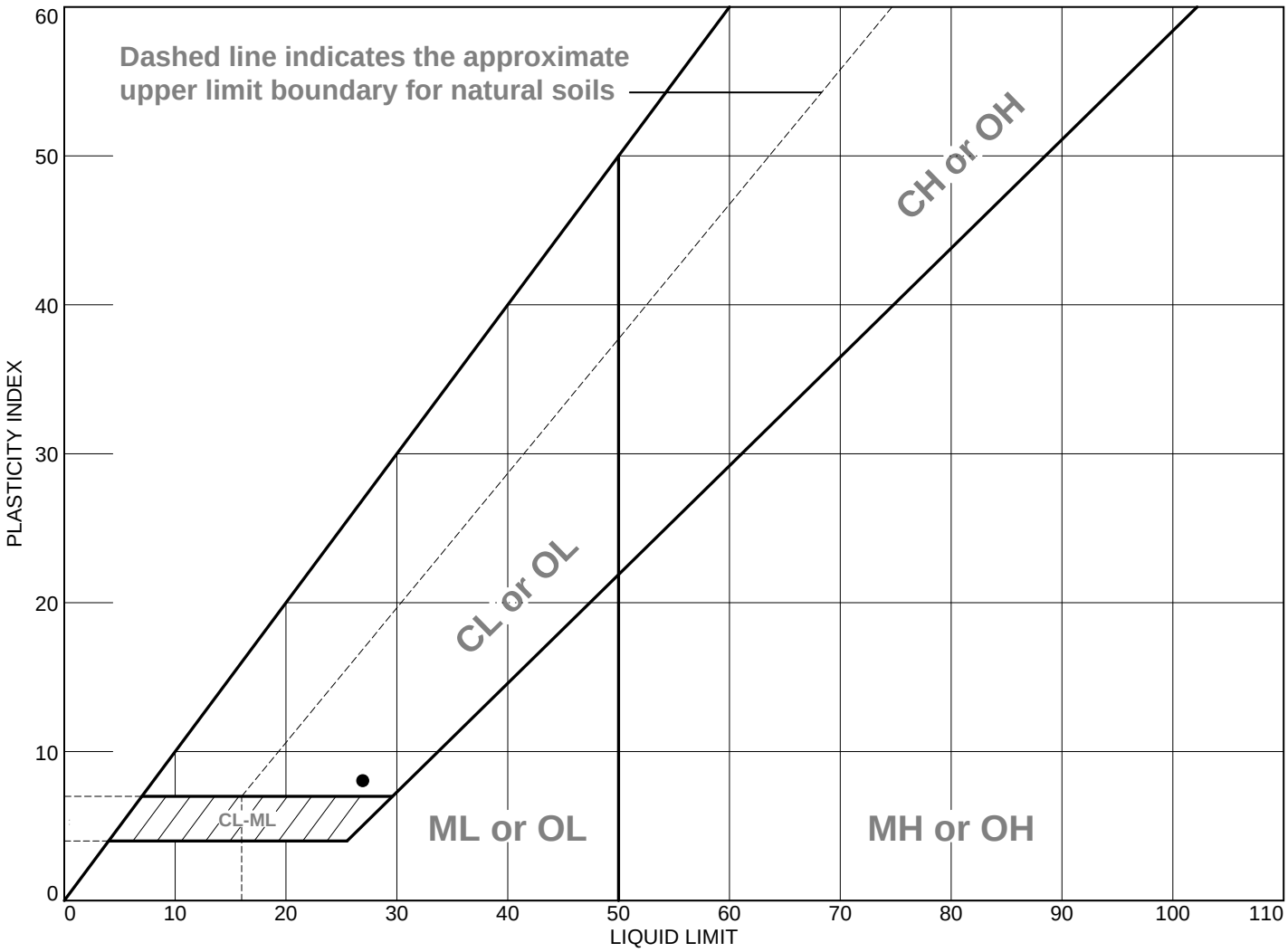
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Silty Clayey Fine to Coarse SAND	27	19	8		31.0	SC

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#13 lift 3 **Depth:** 0.00-0.00 **Sample No.:** D4S-14

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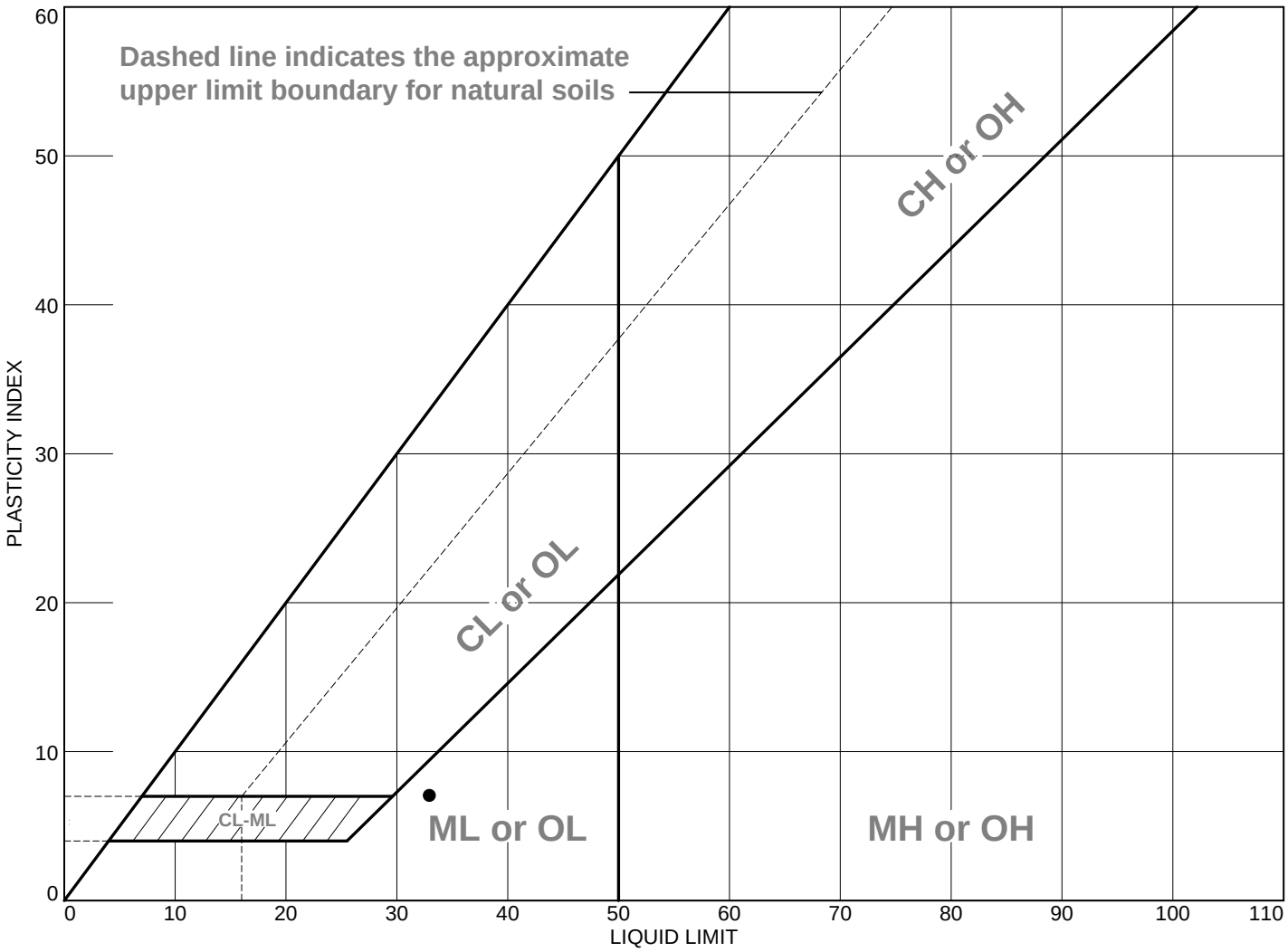
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Silty Fine to Coarse SAND	33	26	7		38.5	SM

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#16 lift 1 **Depth:** 0.00-0.00 **Sample No.:** D4S-15

Remarks:

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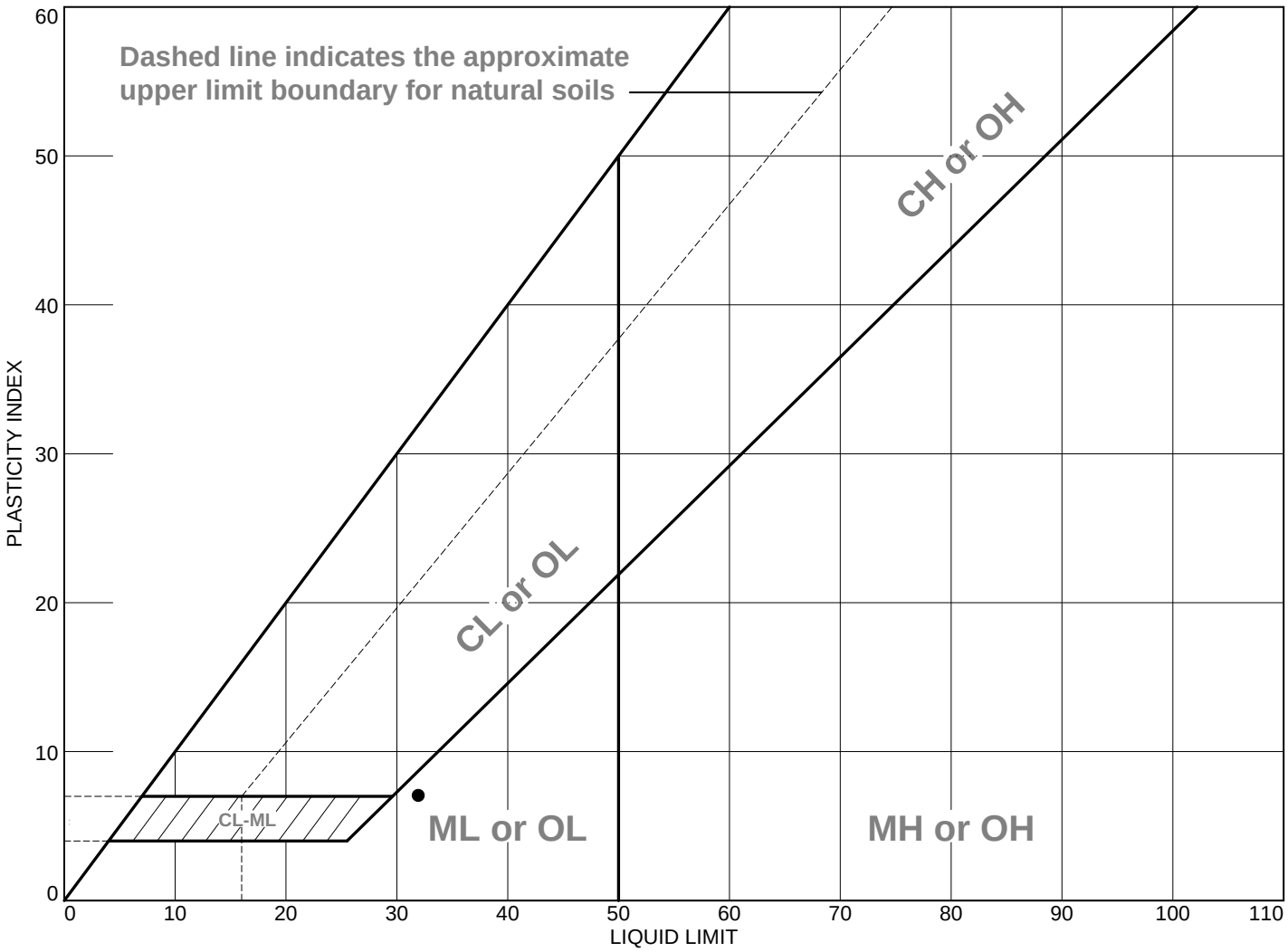
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Brown SILTY Fine to Medium SAND	32	25	7		36.0	SM

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#16 lift 2 **Depth:** 0.00-0.00 **Sample No.:** D4S-16

Remarks:

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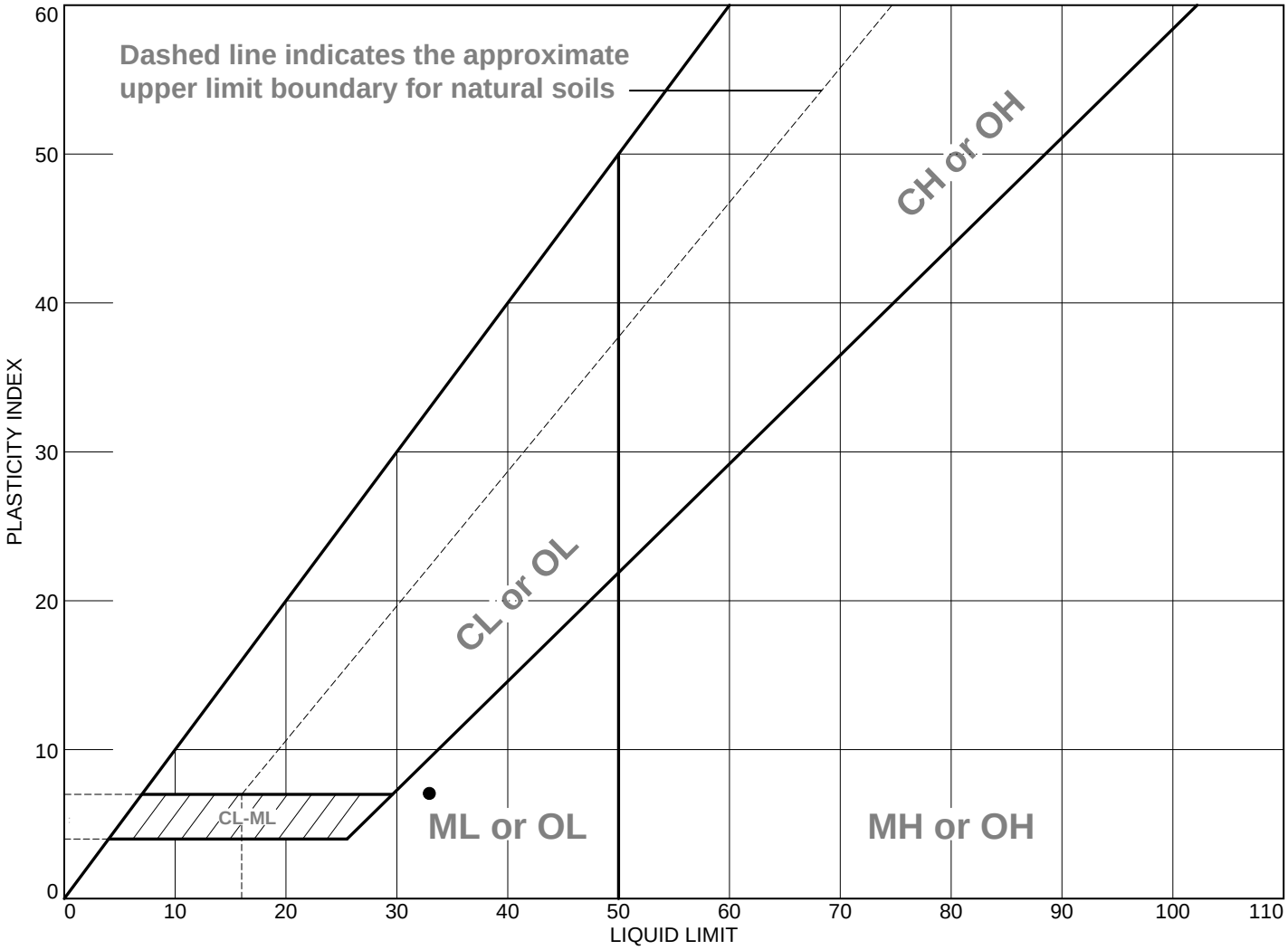
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Tan Brown Silty Fine to Coarse SAND	33	26	7		39.7	SM

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

●**Source:** Grid#16 lift 3 **Depth:** 0.00-0.00 **Sample No.:** D4S-17

Remarks:

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Figure

A6

Moisture-Density Testing

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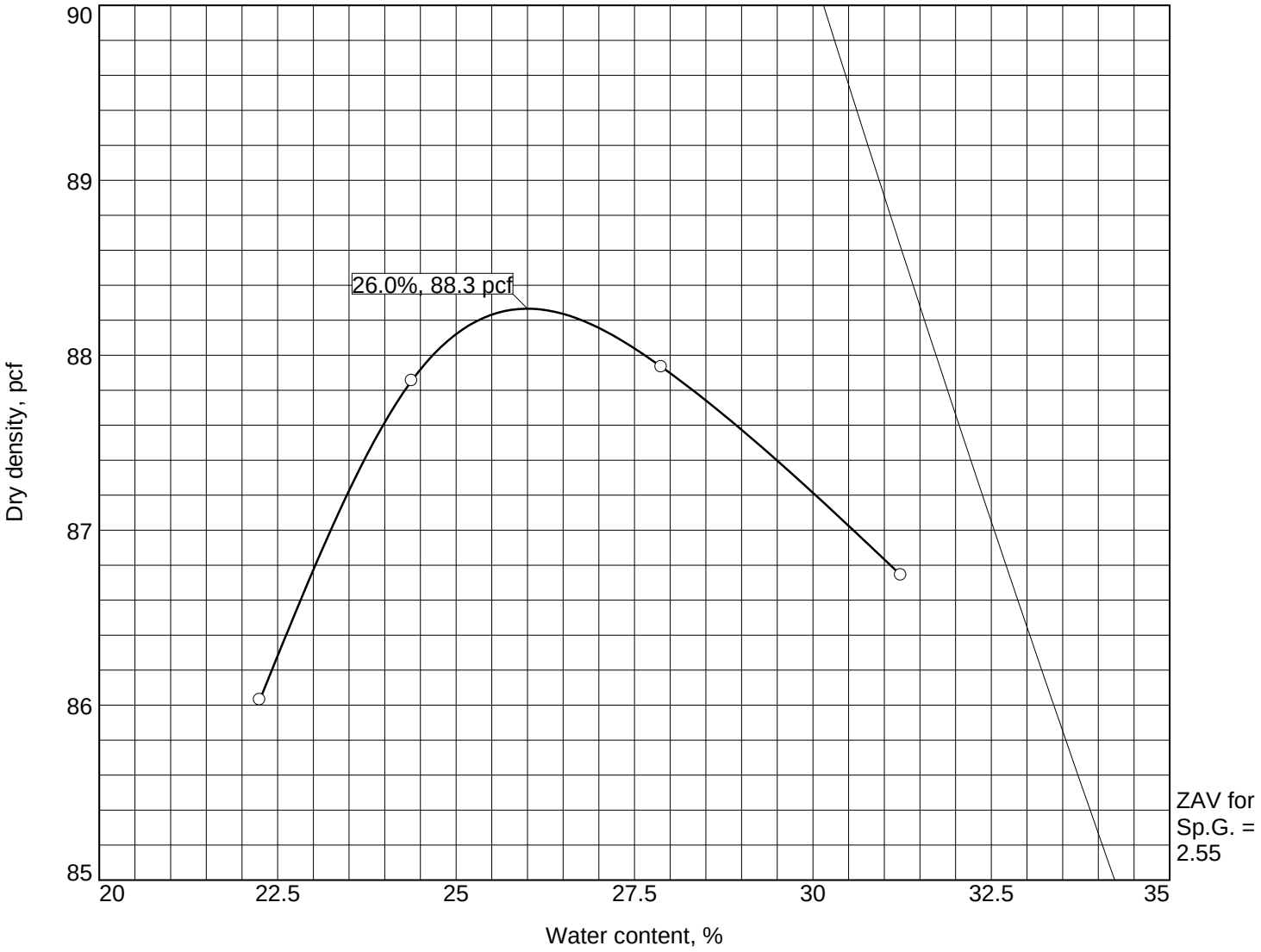

Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00-0.00	ML			2.55				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 88.3 pcf Optimum moisture = 26.0 %	Tan Brown Fine to Medium Sandy SILT

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

Date:

○ **Source of Sample:** PIT #2 **Sample Number:** D4S-4

Remarks:

ECS CAROLINAS, LLP
4811 Koger Boulevard
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Phone: (336) 856-7150
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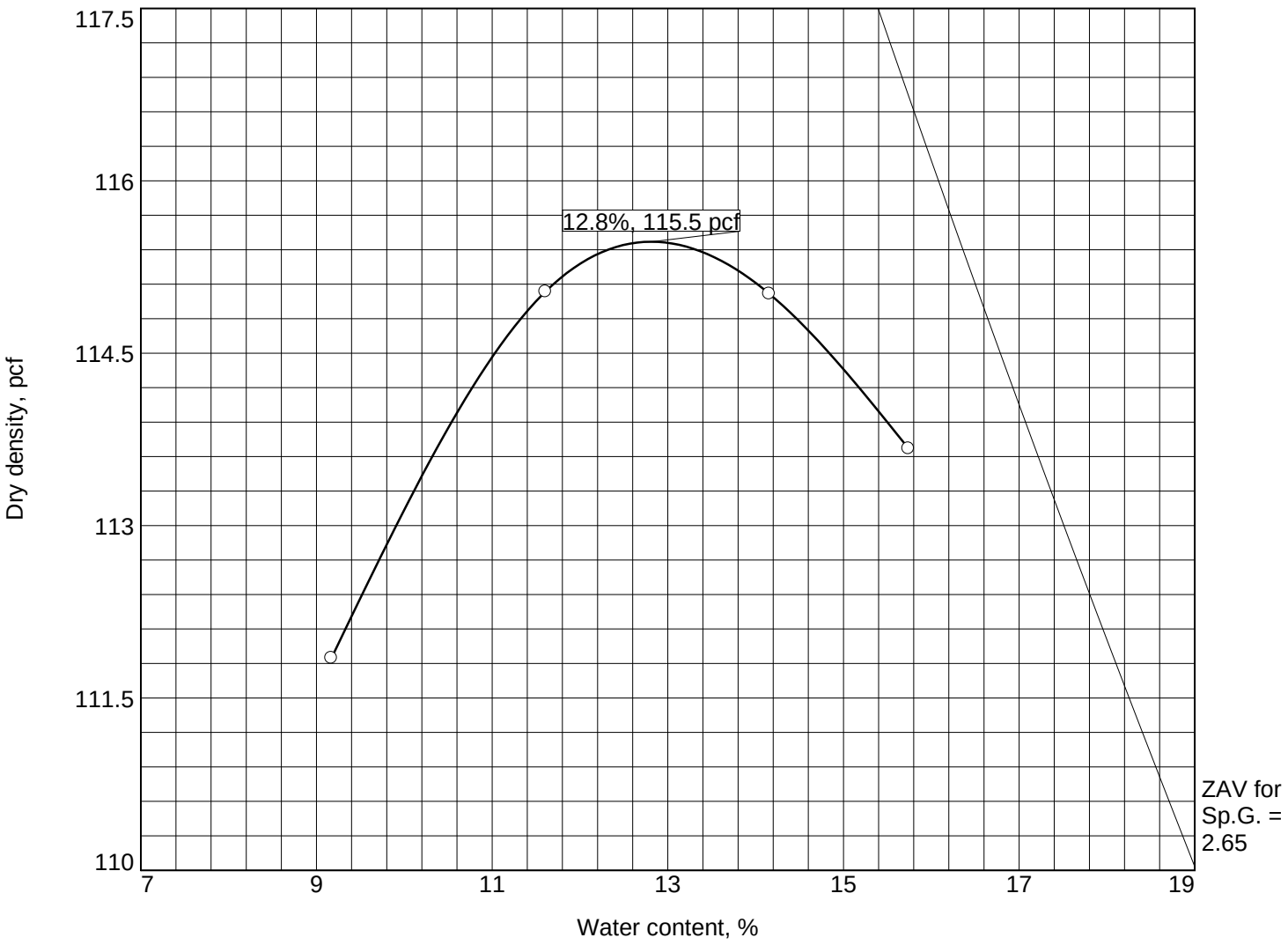
Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00-0.00	SM			2.65				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115.5 pcf Optimum moisture = 12.8 %	Tan Brown Silty Fine to Coarse SAND

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

Date:

○ **Source of Sample:** PIT #4 **Sample Number:** D4S-3

Remarks:

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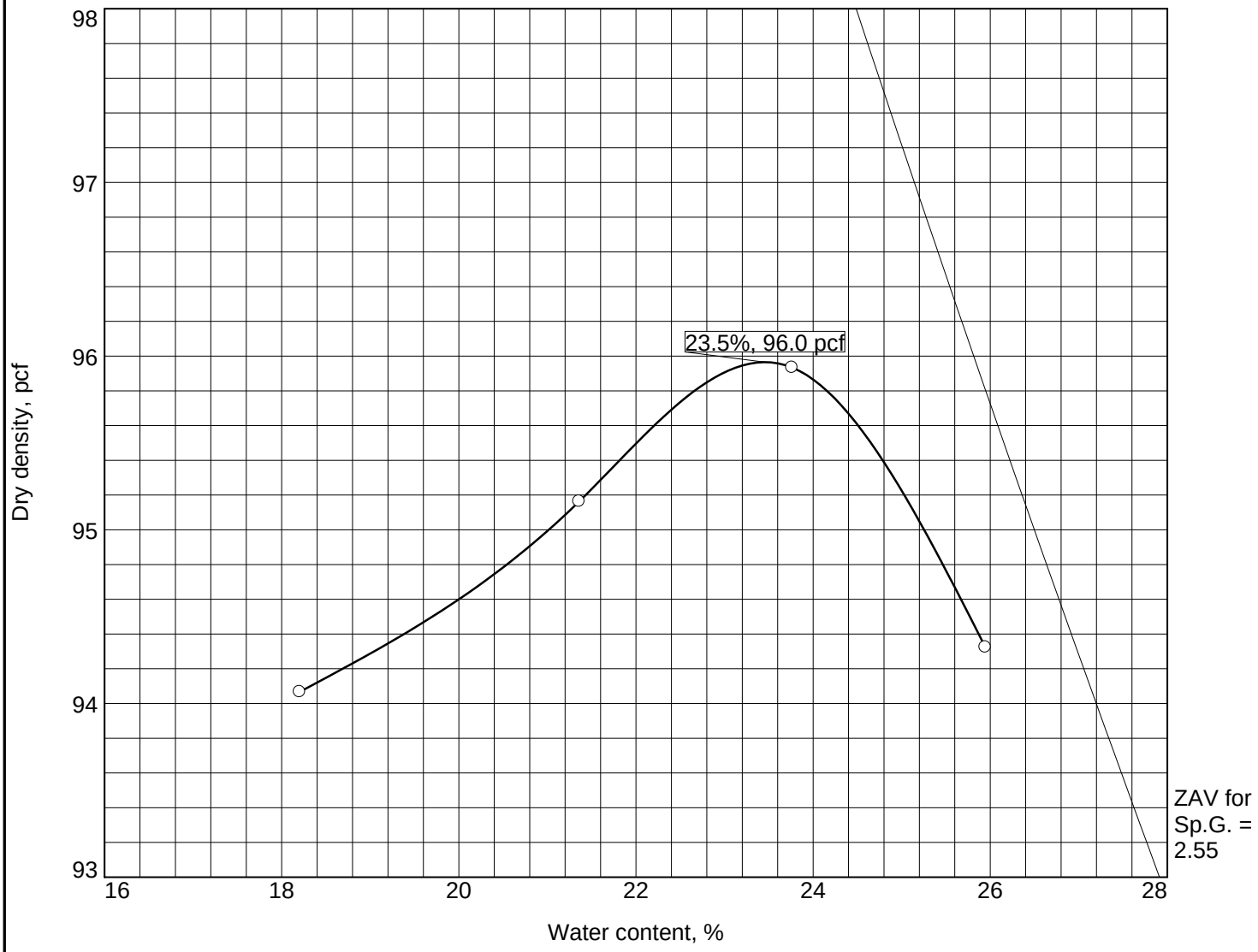
Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00-0.00	ML			2.55				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 96.0 pcf Optimum moisture = 23.5 %	Tan Brown Fine to Medium Sandy SILT

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

Date:

○ **Source of Sample:** PIT #6 **Sample Number:** D4S-1

Remarks:

ECS CAROLINAS, LLP
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Phone: (336) 856-7150
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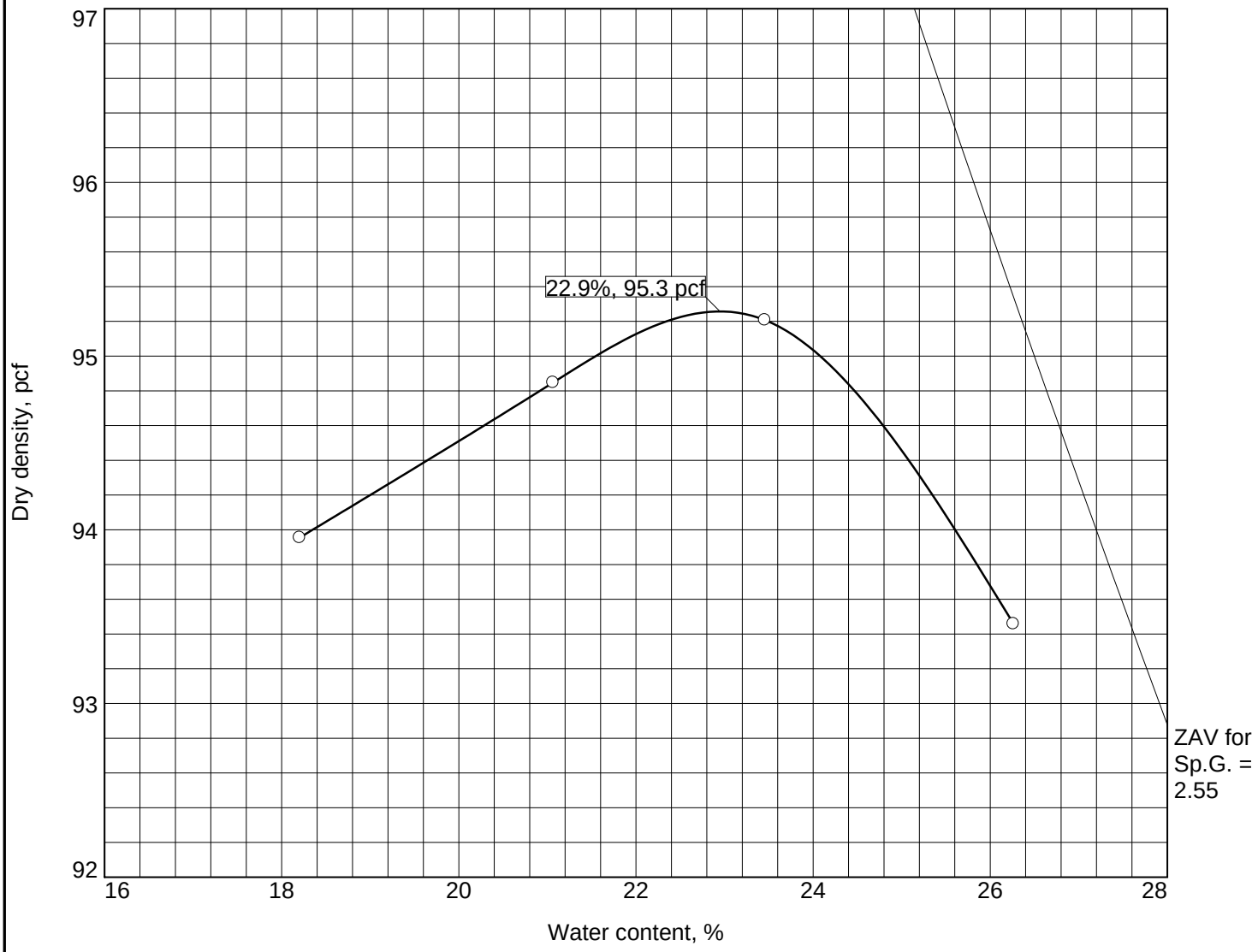
Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00-0.00	ML			2.55				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 95.3 pcf Optimum moisture = 22.9 %	Red Orange Brown Fine to Medium Sandy SILT

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

Date:

○ **Source of Sample:** PIT #7 **Sample Number:** D4S-2

Remarks:

ECS CAROLINAS, LLP
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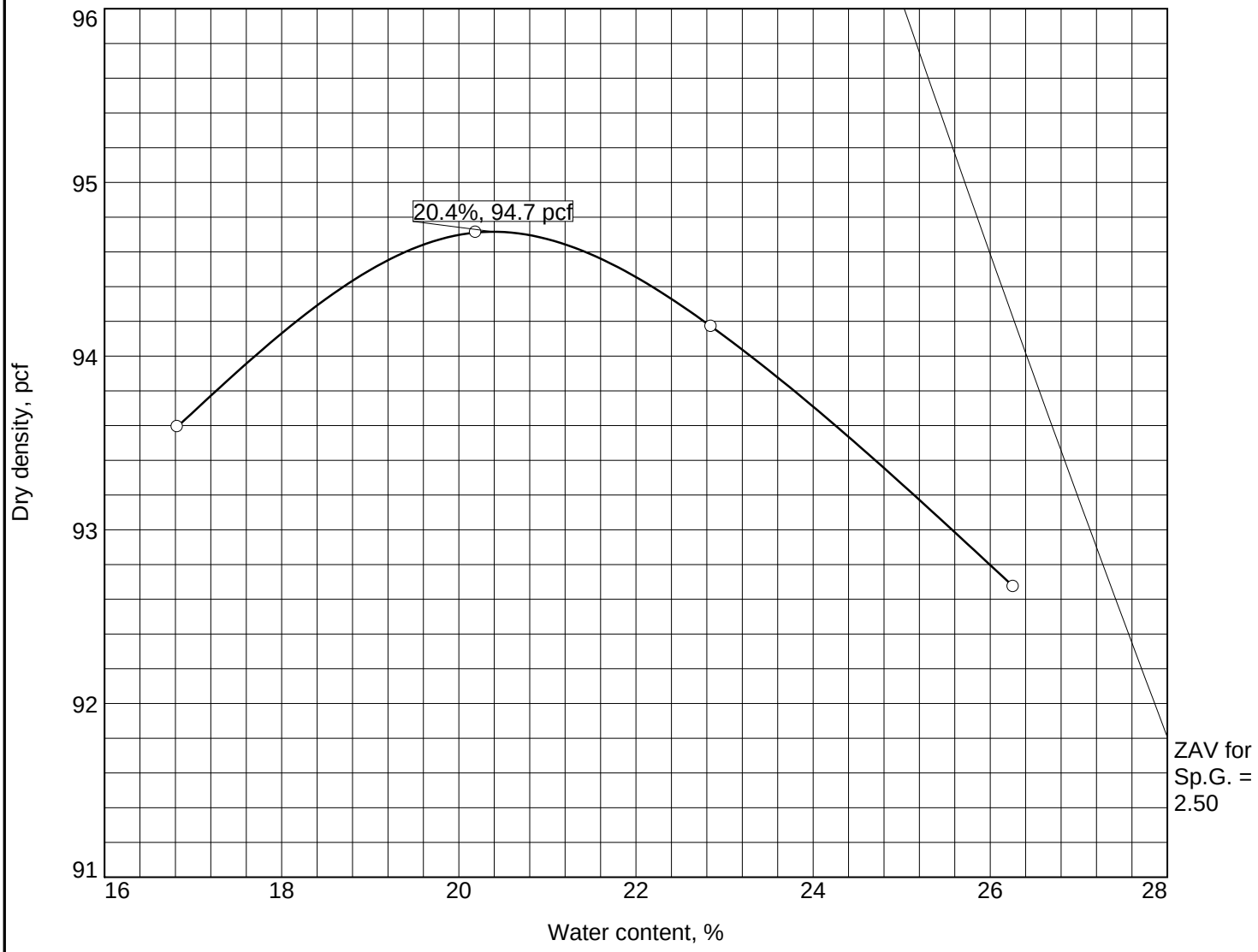
Figure



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.00-0.00	ML		30.2	2.5				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 94.7 pcf Optimum moisture = 20.4 %	Red Fine Sandy SILT

Project No. 20329-A **Client:** Triangle Grading and Paving, Inc.

Project: White Street Landfilll Phase II Part 2

Date:

○ **Source of Sample:** On site barrow pit **Sample Number:** D4S-5

Remarks:

ECS CAROLINAS, LLP
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Greensboro, NC 27407
Phone: (336) 856-7150
Fax: (336) 856-7160

Figure

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B

Appendix B – CQA Testing (HDR / Geotechnics)

B1 Field Reports
B2 Atterberg Limits and Fines Contents
B3 Sieve Analyses
B4 Hydraulic Conductivity

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B1

Field Reports

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Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: March 27, 2014	Day: Thursday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 60°F	Min. 32°F	Clear	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
5	Equipment Operators			
			Grand Total	7

Work Being Done

Work Observed: Observed test pad construction for low permeability soil cap using on-site soils which was being constructed in Section 1 above the access road. Arrived at 0800 and test pad had already been stripped and proofrolled. Both dump trucks broke down after delivering first load of soil. Test pad did not begin again until 1430. By 1630, first lift was in-place and compacted, but ECS determined it did not meet the 95% compaction criterion. HDR obtained bulk sample of soil for testing but no permeability test tubes. Contractor left site at 1700 after smooth rolling test pad because of anticipated rain on Friday.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over)

HDR agreed to waive 95% compaction criterion for subgrade as long as proofrolling passed.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

HDR requested that at least 2' of additional topsoil be stripped where new closure areas abut against old closure area or where new closure sections abut against each other. Approximately half of the clay should be removed from this overlap to allow a key-in of the new clay over the old clay.

Remarks (over)

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: April 2, 2014	Day: Wednesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 80F	Min. 59F	Clear	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
7	Equipment Operators			
			Grand Total	9

Work Being Done

Work Observed: Arrived at 0830 and Test Pad lifts 1 and 2 had been placed. ECS indicated the lifts had met 95% compaction and that an incorrect Proctor curve had been used before. Triangle was placing clay in Sections 2 and 3 above the access road before returning to the test pad to place lift 3. Obtained drive tube for perm tests for lifts 1 and 2 at 0900. Obtained drive tube for lift 3 at 1130. ECS indicated lift 3 did not meet compaction criterion and was only at 92%. HDR left site at 1145 and delivered drive tubes collected today and bulk sample collected last Thursday to Geotechnics in Raleigh for testing.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over)

HDR was asked about the number of field densities required for the clay after the test pad was completed. HDR showed the specs to ECS and Triangle showing a minimum of 2 tests per acre but said the contractor may consider additional tests to make sure the cover is meeting specs.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day None.

Remarks (over) None

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: April 15, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 67F	Min. 35F	Overcast	Other	Light

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor			
1	Laborer			
			Grand Total	2

Work Being Done

Work Observed: Arrived on site at 0830. No work is being performed today due to heavy rains overnight. The perimeter of the disturbed areas was walked in order to see status of erosion controls. Washouts in the clay were observed. Silt has collected on the silt fence on the lower slope and is close to overflowing in areas. The silt fence was breached in Area 1 where the existing slope drain discharges. Some flow beneath the fence was observed. Per discussions with the superintendent, Roger Jackson, an additional line of Silt fence in overflow and breached areas, will be installed. He will also install silt fence in slope drain inlets.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over)

Roger Jackson asked if the full thickness of topsoil had to be placed before beginning work on the next five acres.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day None.

Remarks (over) None

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: April 29, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 56F	Min. 50F	Overcast	Other	Light Rain

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	3	Surveyors	
6	Equipment Operators			
			Grand Total	10

Work Being Done

Work Observed: Arrived on site at 0845. The Contractor is placing clay in Area 2 above the access road. Roger Jackson indicated the full thickness of clay in all other areas. There is clay in Area1, upper Area 2, and Areas 3 and 4. There are some washouts in Area 1 above the access road. The existing slope drain in Area 3 has been extended beyong the silt fence as requested. The Contractor still needs to cover the pipe and replace the riprap.

Work Not Observed, But in Progress: Borrow Area Operations.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day None.

Remarks (over) None

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: May 6, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 85F	Min. 51F	Overcast	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
6	Equipment Operators			
			Grand Total	8

Work Being Done

Work Observed: Arrived on site at 0900. Topsoil is being placed in Areas 1, 2 and 3 above the access road. Clay is being placed in Area 2 below the access road. Topsoil is partially placed in Areas 3 and 4 below the access road.

Work Not Observed, But in Progress: Borrow Area Operations.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

Requested the Contractor to spread thicker layer of topsoil over clay to cover it more completely. Topsoil should be spread without clumps to allow water to sheet flow. Washouts in clay should be repaired prior to spreading topsoil. The Contractor was asked to remove large rocks and roots from topsoil as it is being spread. Requested all vegetation to be removed prior to placing clay.

Remarks (over)

Observed lower portion of Area 6 where unsuitable soil was backfilled and excavated. Triangle and ECS confirmed that the first 6" of excavation is considered site prep and should not be included in measured quantity.

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Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: May 22, 2014	Day: Thursday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 88F	Min. 67F	Overcast	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
2	Supervisors			
4	Equipment Operators			
			Grand Total	6

Work Being Done

Work Observed: The City is fixing a damaged landfill gas pipe in Area 6. Triangle is placing screened topsoil in Area 1. There is partial topsoil placement in all areas except lower 2 and 6. The Contractor is screening topsoil and mixing with leaf compost in the borrow area.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over)

Washouts are occurring in Area 2. Runoff from the access road collects inthis area and cannot be directed to the existing culvert. The Contractor recommends installation of additional slope drains in this area. HDR will address this with the City.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

The City indicated the Contractor had filled in washouts in clay with topsoil instead of clay. The Contractor indicated area (upper Area 1) was Repaired properly (i.e., topsoil was removed and replaced with compacted clay).

Remarks (over) None.

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: May 29, 2014	Day: Thursday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 81F	Min. 66F	Overcast	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
8	Equipment Operators			
			Grand Total	10

Work Being Done

Work Observed: Arrived on site at 1200. The Contractor is placing the first lift of offsite clay on test pad (TP-2). The material appears to be suitable with minimal oversize rocks and roots. Material appears to be a uniform light gray, brown, plastic silt (mH). Screening operation is working with blended topsoil being placed in Area 6. TP-2 is located in Area 5.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day None.

Remarks (over) Obtained drive tube samples for all 3 lifts of TP-2 as well as bulk sample for testing at Geotechnics.

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: June 5, 2014	Day: Thursday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 88F	Min. 68F	Clear	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
8	Equipment Operators			
3	Laborers			
			Grand Total	13

Work Being Done

Work Observed: Placing clay in Area 7. Placing topsoil in Area 5.

Work Not Observed, But in Progress: Processing of topsoil in the borrow area.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

1. Deficient erosion control matting in Area 2 above access road.
2. The berm in Area 2 above the acess road needs to be increased in height for containment.
3. The swale in the closure area above the access road does not appear to be draining.
4. There are grass clumps beneath the erosion control mat in Area 6.

Remarks (over) None.

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Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: June 19, 2014	Day: Thursday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 94F	Min. 70F	Clear	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor			
4	Equipment Operators			
6	Haulers			
			Grand Total	11

Work Being Done

Work Observed: Clay is being placed in Sections 8 and 10. Section 9 has final clay thickness. Drive tube and bulk samples were taken in Section 9. Additional slope drains in Section 2 have been installed, but the area needs to be graded.

Work Not Observed, But in Progress: Screening of topsoil.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

Silt needs to be removed and silt fence repaired in low area near existing slope drain inlets. Riprap inlet protection needs to be installed. The Contractor needs to do a better job of stripping to remove soil ridges.

Remarks (over) None.

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Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: July 8, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 94F	Min. 71F	Partly Cloudy	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
8	Equipment Operators			
			Grand Total	10

Work Being Done

Work Observed: Offsite clay is being stockpiled in Area 8. The bulldozers are broken down so no soil is being spread. The Contractor is hoping to have them repaired and running after lunch.

Work Not Observed, But in Progress: Screening and mixing of topsoil in the borrow area.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day None.

Remarks (over) Sampled 2 duplicated drive tube samples in clay in Area 8 (Section 8, Samples 1A and 1B). Only one tube will be tested for hydraulic conductivity. Bulk samples were also obtained in the vicinity of the drive tubes and at the clay stockpile for classification testing.

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Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: July 29, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 82F	Min. 62F	Partly Cloudy	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
10	Equipment Operators	2	Bateman Civil	Survey
			Grand Total	14

Work Being Done

Work Observed: Clay is being placed in Areas 13 and 14. Topsoil is being place in Areas 11 and 12.

Work Not Observed, But in Progress: Off-site borrow area operations.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

HDR requested the Contractor repair silt fence in the low areas.

Remarks (over) None.

Distribution: ☒ File ☐ Project Manager ☐ Resident

Date:

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: August 19, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 81F	Min. 75F	Partly Cloudy	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor	1	ECS	CQC
4	Equipment Operators			
			Grand Total	6

Work Being Done

Work Observed: Final lift of clay is being placed in Area 16.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day

The silt fence areound several inlets on the North and West sides need s to be repaired. The low area in Areas 11 and 13 need to be Filled and graded and drained.

Remarks (over) Duplicated drive tube samples were taken in Areas 14 and 17 for permeability testing. Bag samples at both locations for sieve analysis and Atterberg limits were also collected.

Distribution: ☒ File ☐ Project Manager ☐ Resident

Daily Field Report

Project Name: White Street Landfilll Phase II Partial Closure, Part 2	Date: September 16, 2014	Day: Tuesday
Project Owner: City of Greensboro	Contractor: Triangle Grading and Paving	
HDR Project No. 00018 109019 006	Address: 2503 White Street, Greensboro, NC	

Weather Conditions:

Temperature		Phenomena		Precipitation
Max. 83F	Min. 67F	Partly Cloudy	Other	None

Contractor's Employees: Triangle Grading		**Subcontractor's Employees:**		
No.	Craft	No.	Name	Craft
1	Supervisor			
4	Equipment Operators			
			Grand Total	5

Work Being Done

Work Observed: Topsoil is being spread in Area 14. Topsoil is also being screened in the borrow area.

Work Not Observed, But in Progress: None.

Requested Revisions and/or Interpretations (over) None.

Construction Deficiencies Reported to Gen. Contractor This Day and/or Corrected This Day None.

Remarks (over) None.

Distribution: ☒ File ☐ Project Manager ☐ Resident

B2

Atterberg Limits and Fines Contents

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Test Pad for On-Site Material Area 1

Client:	HDR ENGINEERING	Boring No.:	TEST PAD
Client Reference:	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft):	BULK
Project No.:	2014-660-01	Sample No.:	1
Lab ID:	2014-660-01-04	Soil Description:	**RED ELASTIC SILT**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

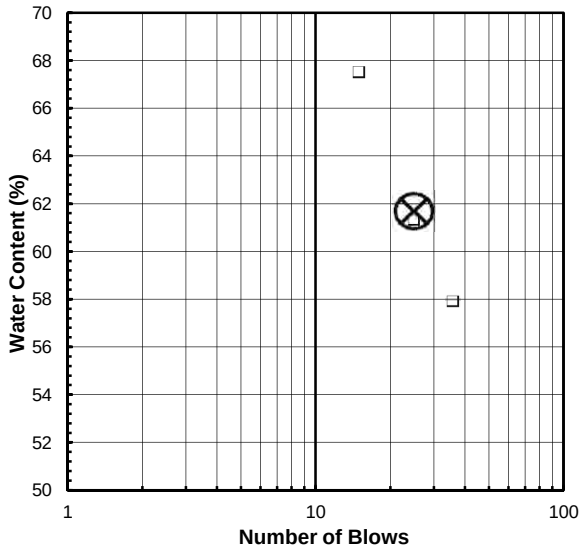
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	K-P	X-9	A-O	**MULTIPOINT**
Wt. of Tare & Wet Sample (g)	28.52	27.68	27.22	
Wt. of Tare & Dry Sample (g)	23.75	23.15	22.47	
Wt. of Tare (g)	15.51	15.76	15.43	
Wt. of Water (g)	4.8	4.5	4.8	
Wt. of Dry Sample (g)	8.2	7.4	7.0	
Moisture Content (%)	**57.9**	**61.3**	**67.5**	
Number of Blows	**36**	**25**	**15**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	Q	A-B	
Wt. of Tare & Wet Sample (g)	27.29	24.28	
Wt. of Tare & Dry Sample (g)	24.29	22.06	
Wt. of Tare (g)	15.17	15.58	
Wt. of Water (g)	3.0	2.2	
Wt. of Dry Sample (g)	9.1	6.5	
Moisture Content (%)	**32.9**	**34.3**	**-1.4**

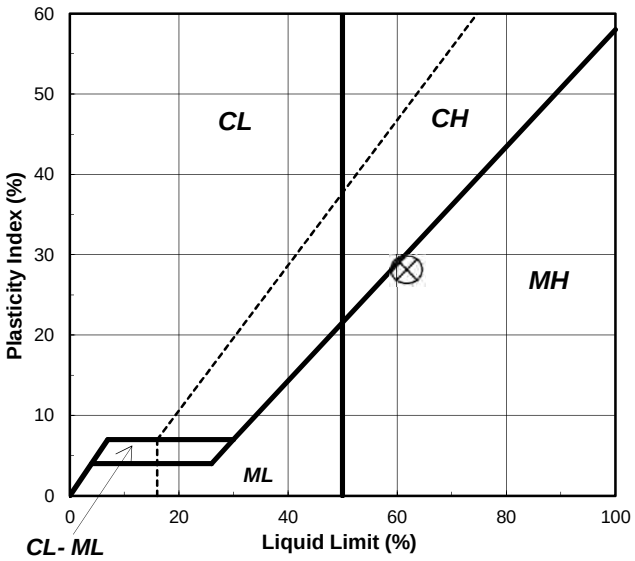
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**62**
Plastic Limit (%)	**34**
Plasticity Index (%)	**28**
USCS Symbol	**MH**

Flow Curve



Plasticity Chart



Tested By	*SS*	*Date*	*4/7/14*	*Checked By*	*GEM*	*Date*	*4/9/14*

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Test Pad
Off-Site Material
Area 5

Client:	HDR ENGINEERING, INC.	Boring No.:	NA
Client Reference:	GREENSBORO PH II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-02	Sample No.:	TP-2
Lab ID:	2014-660-02-01	Soil Description:	**BROWN LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

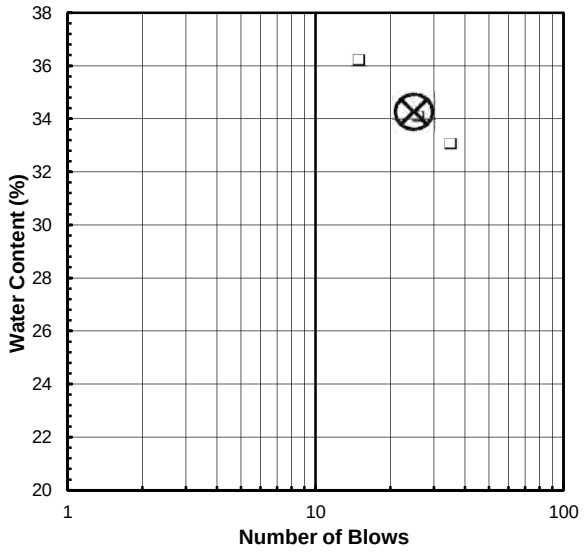
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	D-1	Y	BB	**MULTIPOINT**
Wt. of Tare & Wet Sample (g)	28.26	29.63	31.51	
Wt. of Tare & Dry Sample (g)	25.04	26.08	27.27	
Wt. of Tare (g)	15.29	15.66	15.55	
Wt. of Water (g)	3.2	3.6	4.2	
Wt. of Dry Sample (g)	9.8	10.4	11.7	
Moisture Content (%)	**33.0**	**34.1**	**36.2**	
Number of Blows	**35**	**26**	**15**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	4M	T	
Wt. of Tare & Wet Sample (g)	23.88	23.25	
Wt. of Tare & Dry Sample (g)	22.60	22.05	
Wt. of Tare (g)	15.66	15.22	
Wt. of Water (g)	1.3	1.2	
Wt. of Dry Sample (g)	6.9	6.8	
Moisture Content (%)	**18.4**	**17.6**	**0.9**

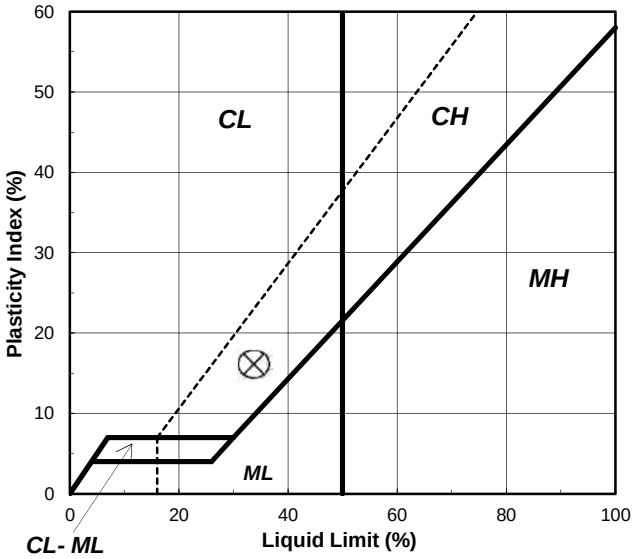
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**34**
Plastic Limit (%)	**18**
Plasticity Index (%)	**16**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By *BW* *Date* *6/3/14* *Checked By* *GEM* *Date* 6/4/14

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Area 8 Perm
Sample Location

Client:	HDR ENGINEERING, INC.	Boring No.:	AREA 8
Client Reference:	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-04	Sample No.:	SAMPLE 1
Lab ID:	2014-660-04-03	Soil Description:	**TAN SILTY CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

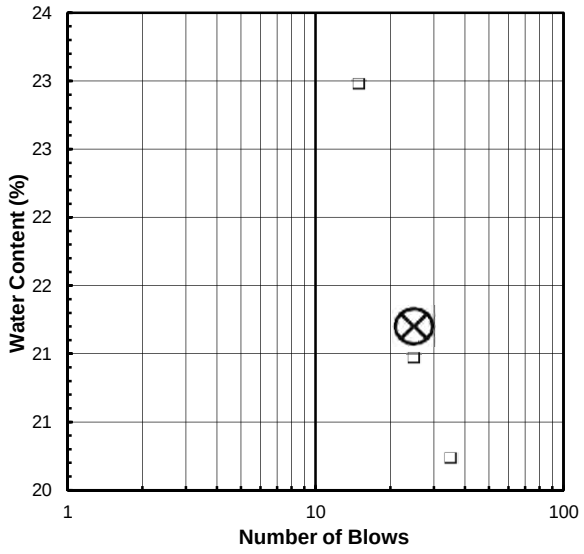
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	I	A-O	L	**MULTIPOINT**
Wt. of Tare & Wet Sample (g)	29.97	28.98	28.19	
Wt. of Tare & Dry Sample (g)	27.50	26.64	25.78	
Wt. of Tare (g)	15.29	15.48	15.29	
Wt. of Water (g)	2.5	2.3	2.4	
Wt. of Dry Sample (g)	12.2	11.2	10.5	
Moisture Content (%)	**20.2**	**21.0**	**23.0**	
Number of Blows	**35**	**25**	**15**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-C	U	
Wt. of Tare & Wet Sample (g)	22.66	22.67	
Wt. of Tare & Dry Sample (g)	21.68	21.61	
Wt. of Tare (g)	15.59	15.18	
Wt. of Water (g)	1.0	1.1	
Wt. of Dry Sample (g)	6.1	6.4	
Moisture Content (%)	**16.1**	**16.5**	**-0.4**

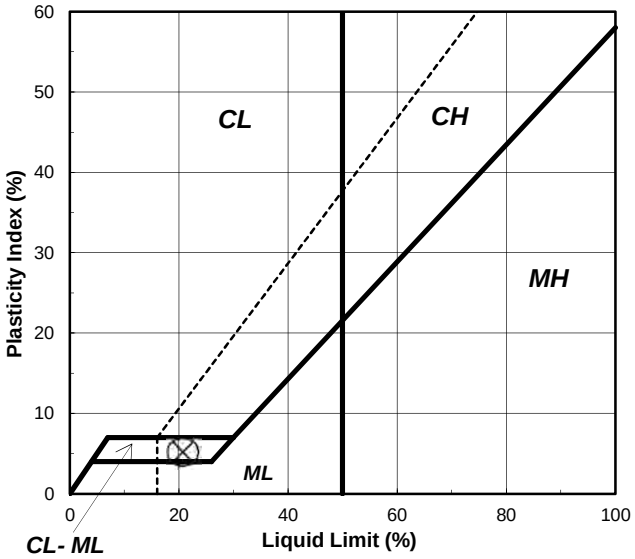
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**21**
Plastic Limit (%)	**16**
Plasticity Index (%)	**5**
USCS Symbol	**CL-ML**

Flow Curve



Plasticity Chart



Tested By	*BW*	*Date*	*7/14/14*	*Checked By*	*GEM*	*Date*	7/15/14

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Area 8 Stockpile

Client:	HDR ENGINEERING, INC.	Boring No.:	AREA 8
Client Reference:	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-04	Sample No.:	STOCKPILE
Lab ID:	2014-660-04-02	Soil Description:	**LIGHT BROWN SILT**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

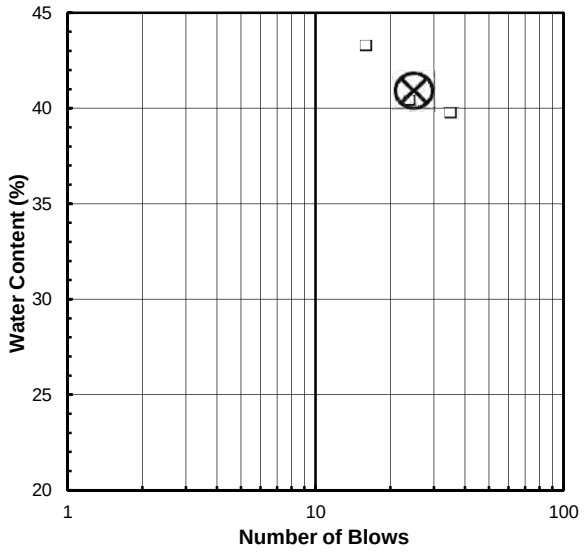
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	A-D	A-T	A-11	**MULTIPOINT**
Wt. of Tare & Wet Sample (g)	27.15	27.41	28.67	
Wt. of Tare & Dry Sample (g)	23.82	24.03	24.72	
Wt. of Tare (g)	15.44	15.66	15.59	
Wt. of Water (g)	3.3	3.4	4.0	
Wt. of Dry Sample (g)	8.4	8.4	9.1	
Moisture Content (%)	**39.7**	**40.4**	**43.3**	
Number of Blows	**35**	**24**	**16**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	B1	K	
Wt. of Tare & Wet Sample (g)	22.26	23.38	
Wt. of Tare & Dry Sample (g)	20.68	21.40	
Wt. of Tare (g)	15.65	15.23	
Wt. of Water (g)	1.6	2.0	
Wt. of Dry Sample (g)	5.0	6.2	
Moisture Content (%)	**31.4**	**32.1**	**-0.7**

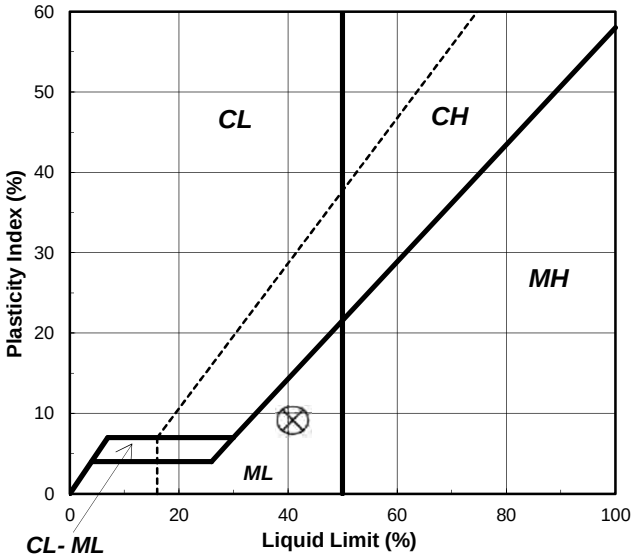
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**41**
Plastic Limit (%)	**32**
Plasticity Index (%)	**9**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By	*BW*	*Date*	*7/14/14*	*Checked By*	*GEM*	*Date*	7/15/14

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Area 9

Client:	HDR ENGINEERING, INC.	Boring No.:	CLAY
Client Reference:	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-03	Sample No.:	109019
Lab ID:	2014-660-03-02	Soil Description:	**TAN LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

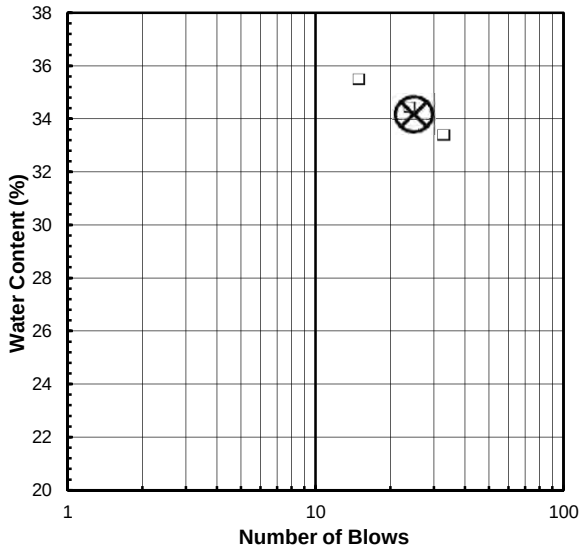
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	B-1	K-P	A-K	**MULTIPOINT**
Wt. of Tare & Wet Sample (g)	27.65	26.78	26.99	
Wt. of Tare & Dry Sample (g)	24.65	23.91	24.00	
Wt. of Tare (g)	15.66	15.57	15.57	
Wt. of Water (g)	3.0	2.9	3.0	
Wt. of Dry Sample (g)	9.0	8.3	8.4	
Moisture Content (%)	**33.4**	**34.4**	**35.5**	
Number of Blows	**33**	**24**	**15**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	T	4M	
Wt. of Tare & Wet Sample (g)	23.74	22.86	
Wt. of Tare & Dry Sample (g)	22.17	21.52	
Wt. of Tare (g)	15.23	15.66	
Wt. of Water (g)	1.6	1.3	
Wt. of Dry Sample (g)	6.9	5.9	
Moisture Content (%)	**22.6**	**22.9**	**-0.2**

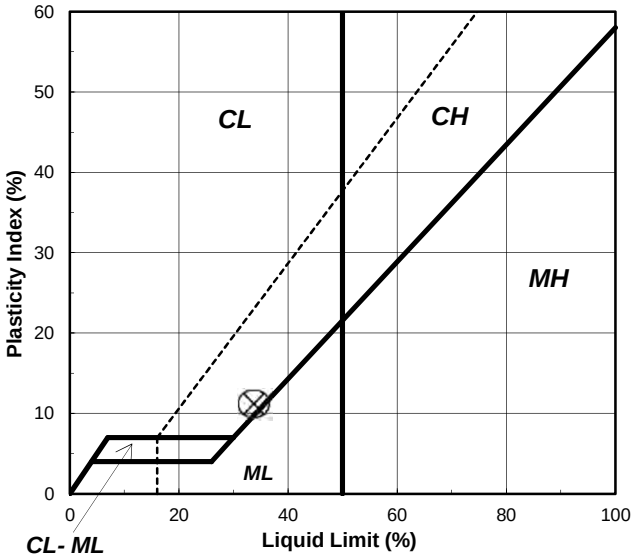
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**34**
Plastic Limit (%)	**23**
Plasticity Index (%)	**11**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By	*BW*	*Date*	*6/27/14*	*Checked By*	*GEM*	*Date*	6/30/14

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Area 14

Client:	HDR ENGINEERING, INC.	Boring No.:	14
Client Reference:	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-05	Sample No.:	1A
Lab ID:	2014-660-05-02	Soil Description:	**TAN LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

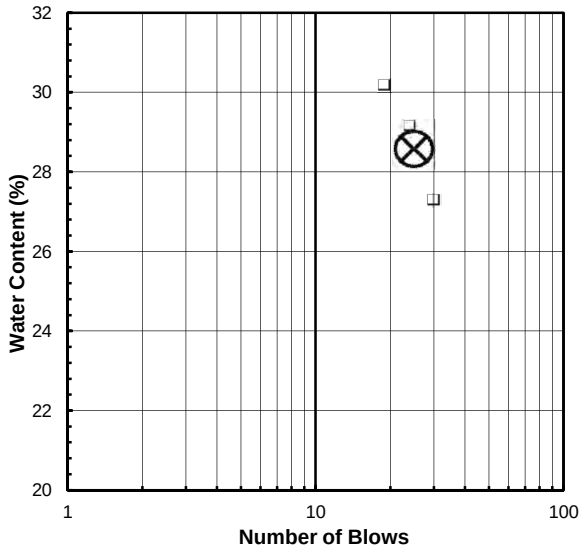
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	120	1254	1261	**M**
Wt. of Tare & Wet Sample (g)	39.58	37.48	44.89	**U**
Wt. of Tare & Dry Sample (g)	34.93	32.68	39.83	**L**
Wt. of Tare (g)	17.88	16.21	23.06	**T**
Wt. of Water (g)	4.7	4.8	5.1	**I**
Wt. of Dry Sample (g)	17.1	16.5	16.8	**P**
				O
Moisture Content (%)	**27.3**	**29.1**	**30.2**	**I**
Number of Blows	**30**	**24**	**19**	**N**
				T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	1224	1250	
Wt. of Tare & Wet Sample (g)	19.73	22.19	
Wt. of Tare & Dry Sample (g)	18.75	21.23	
Wt. of Tare (g)	13.60	16.20	
Wt. of Water (g)	1.0	1.0	
Wt. of Dry Sample (g)	5.2	5.0	
Moisture Content (%)	**19.0**	**19.1**	**-0.1**

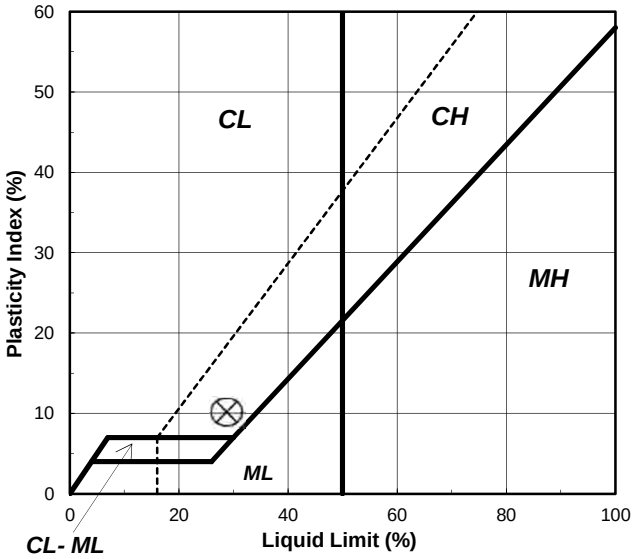
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**29**
Plastic Limit (%)	**19**
Plasticity Index (%)	**10**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By	*JP*	*Date*	*8/28/14*	*Checked By*	*GEM*	*Date*	8/29/14

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ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10

Area 17

Client:	HDR ENGINEERING, INC.	Boring No.:	17
Client Reference:	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-05	Sample No.:	1A
Lab ID:	2014-660-05-01	Soil Description:	**TAN LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

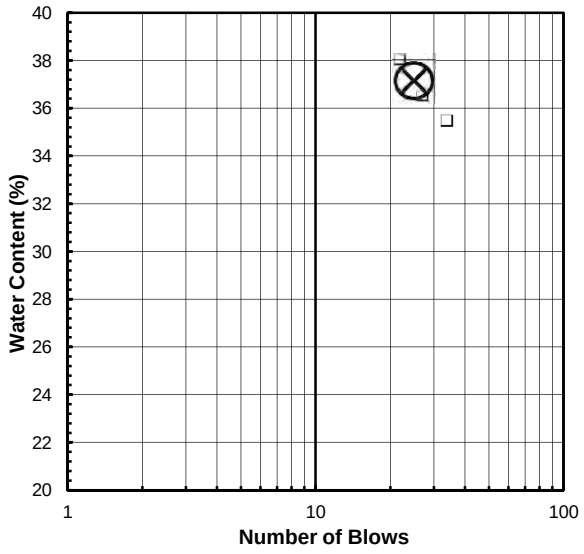
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	293	347	1285	**M**
Wt. of Tare & Wet Sample (g)	40.25	39.07	33.21	**U**
Wt. of Tare & Dry Sample (g)	34.52	33.66	27.36	**L**
Wt. of Tare (g)	18.35	18.85	11.96	**T**
Wt. of Water (g)	5.7	5.4	5.9	**I**
Wt. of Dry Sample (g)	16.2	14.8	15.4	**P**
				O
Moisture Content (%)	**35.4**	**36.5**	**38.0**	**I**
Number of Blows	**34**	**27**	**22**	**N**
				T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	216	222	
Wt. of Tare & Wet Sample (g)	26.27	26.92	
Wt. of Tare & Dry Sample (g)	25.15	25.85	
Wt. of Tare (g)	19.79	20.88	
Wt. of Water (g)	1.1	1.1	
Wt. of Dry Sample (g)	5.4	5.0	
Moisture Content (%)	**20.9**	**21.5**	**-0.6**

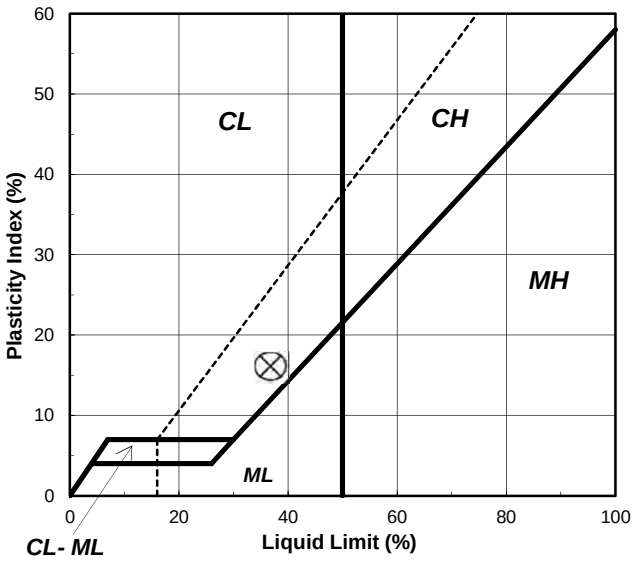
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**37**
Plastic Limit (%)	**21**
Plasticity Index (%)	**16**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By	*JP*	*Date*	*8/27/14*	*Checked By*	*GEM*	*Date*	8/29/14

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B3

Sieve Analyses

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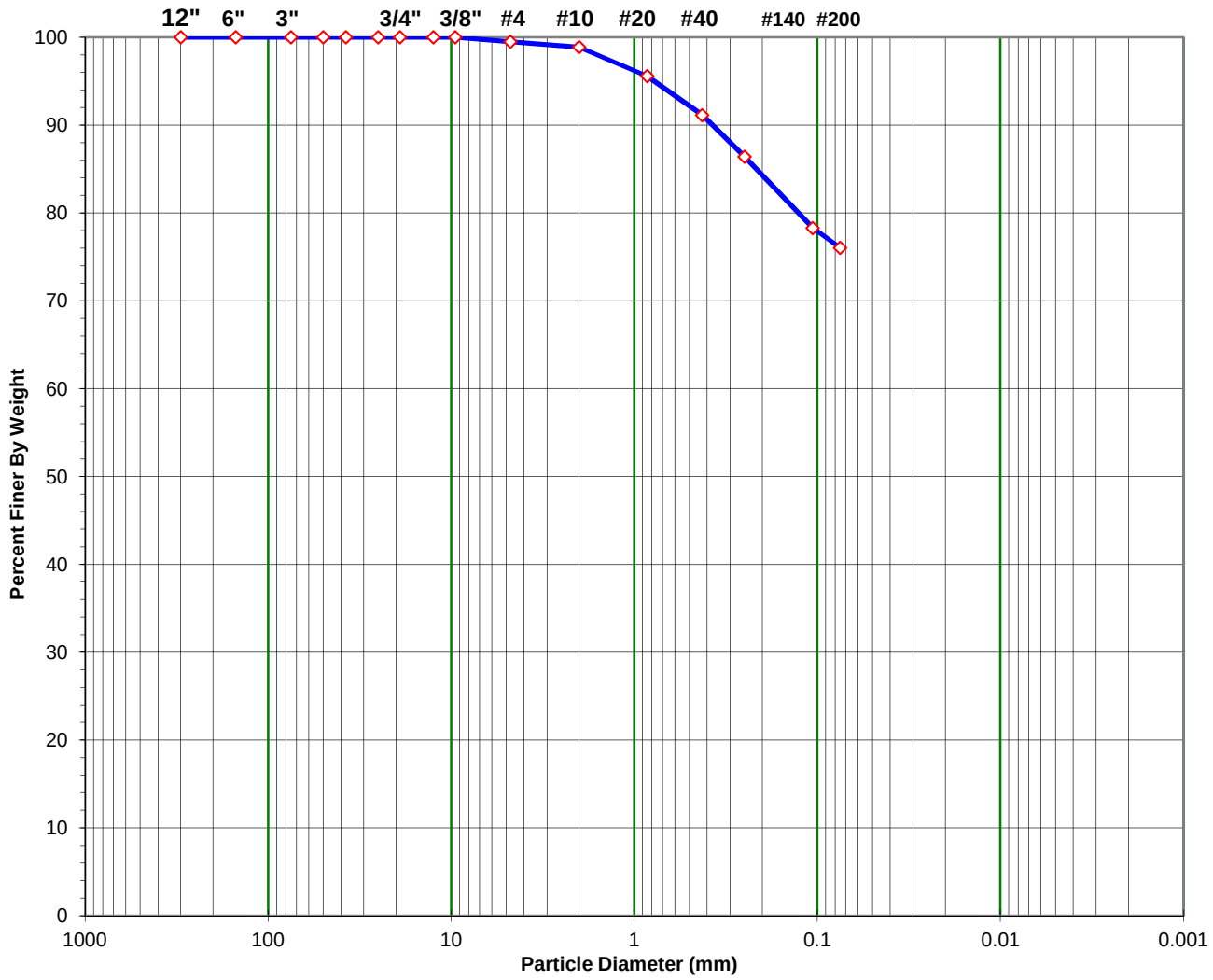
On-Site Material
Test Pad
Area 1

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client	HDR ENGINEERING	Boring No.	TEST PAD
Client Reference	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft)	BULK
Project No.	2014-660-01	Sample No.	1
Lab ID	2014-660-01-04	Soil Color	**RED**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***MH, TESTED***

USCS Classification ELASTIC SILT WITH SAND

Tested By	SS	Date	4/3/14	Checked By	GEM	Date	4/9/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2
T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-04 SIEVON REV 4.xls]Sheet1

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	HDR ENGINEERING	Boring No.	TEST PAD
Client Reference	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft)	BULK
Project No.	2014-660-01	Sample No.	1
Lab ID	2014-660-01-04	Soil Color	**RED**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	831	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	693.89	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	588.97	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	262.44	Weight of Tare (gm)	NA
Weight of Water (gm)	104.92	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	326.53	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**32.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	326.53
Dry Weight - 3/4" Sample (gm)	78.3	Weight of minus #200 material (gm)	248.25
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	78.28
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.66	0.5	0.5	99.5	**99.5**
#10	2.00	2.00	0.6	1.1	98.9	**98.9**
#20	0.850	10.77	3.3	4.4	95.6	**95.6**
#40	0.425	14.50	4.4	8.9	91.1	**91.1**
#60	0.250	15.40	4.7	13.6	86.4	**86.4**
#140	0.106	26.55	8.1	21.7	78.3	**78.3**
#200	0.075	7.40	2.3	24.0	76.0	**76.0**
Pan	-	248.25	76.0	100.0	-	**-**

Tested By SS Date 4/3/14 Checked By GEM Date 4/9/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2

T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-04 SIEVON REV 4.xls]Sheet1

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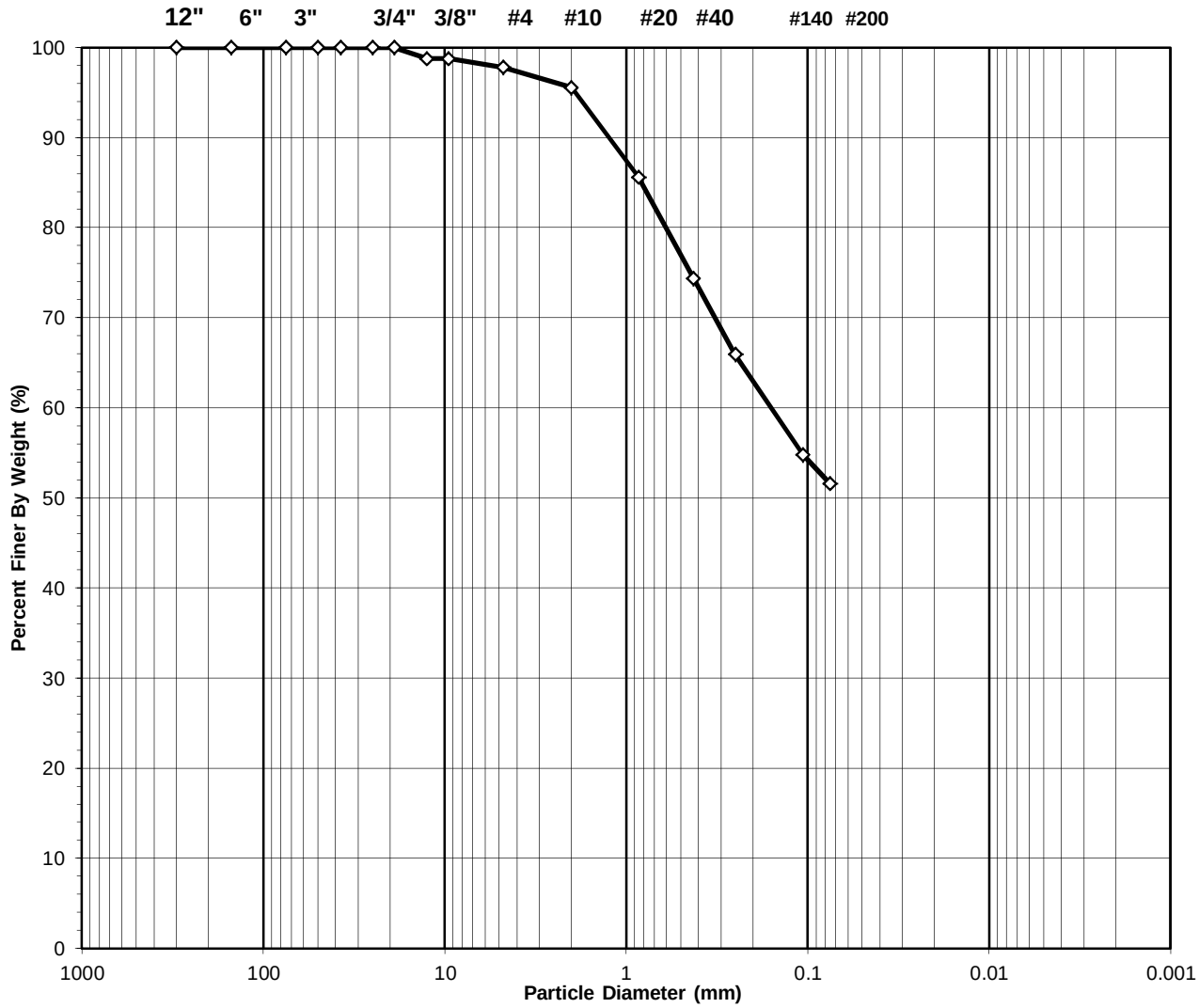
On-Site Material
Test Pad
Area 5

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	HDR ENGINEERING	Boring No.:	NA
Client Reference:	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-02	Sample No.:	TP-2
Lab ID:	2014-660-02-01	Soil Color:	BROWN

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol: ***CL, TESTED***

USCS Classification SANDY LEAN CLAY

Tested By BW Date 6/3/14 Checked By GEM Date 6/3/14

DCN: CT-S3C DATE 3/20/13 REVISION: 3

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	HDR ENGINEERING	Boring No.:	NA
Client Reference:	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft):	NA
Project No.:	2014-660-02	Sample No.:	TP-2
Lab ID:	2014-660-02-01	Soil Color:	BROWN

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.	841	Tare No.	NA
Wt. of Tare & Wet Sample (g)	801.26	Weight of Tare & Wet Sample (g)	NA
Wt. of Tare & Dry Sample (g)	715.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	259.23	Weight of Tare (g)	NA
Weight of Water (g)	85.96	Weight of Water (g)	NA
Weight of Dry Sample (g)	456.07	Weight of Dry Sample (g)	NA
Moisture Content (%)	**18.8**	**Moisture Content (%)**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	456.07
Dry Weight of - 3/4" Sample (g)	220.9	Weight of - #200 Sample (g)	235.18
Wet Weight of +3/4" Sample (g	NA	Weight of + #200 Sample (g)	220.89
Dry Weight of + 3/4" Sample (g	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	5.64	1.24	1.24	98.76	**98.76**
3/8"	9.50	0.00	0.00	1.24	98.76	**98.76**
#4	4.75	4.55	1.00	2.23	97.77	**97.77**
#10	2.00	10.20	2.24	4.47	95.53	**95.53**
#20	0.850	45.45	9.97	14.44	85.56	**85.56**
#40	0.425	51.11	11.21	25.64	74.36	**74.36**
#60	0.250	38.56	8.45	34.10	65.90	**65.90**
#140	0.106	50.82	11.14	45.24	54.76	**54.76**
#200	0.075	14.56	3.19	48.43	51.57	**51.57**
Pan	-	235.18	51.57	100.00	-	**-**

Tested By BW Date 6/3/14 Checked By GEM Date 6/3/14

DCN: CT-S3C DATE 3/20/13 REVISION: 3

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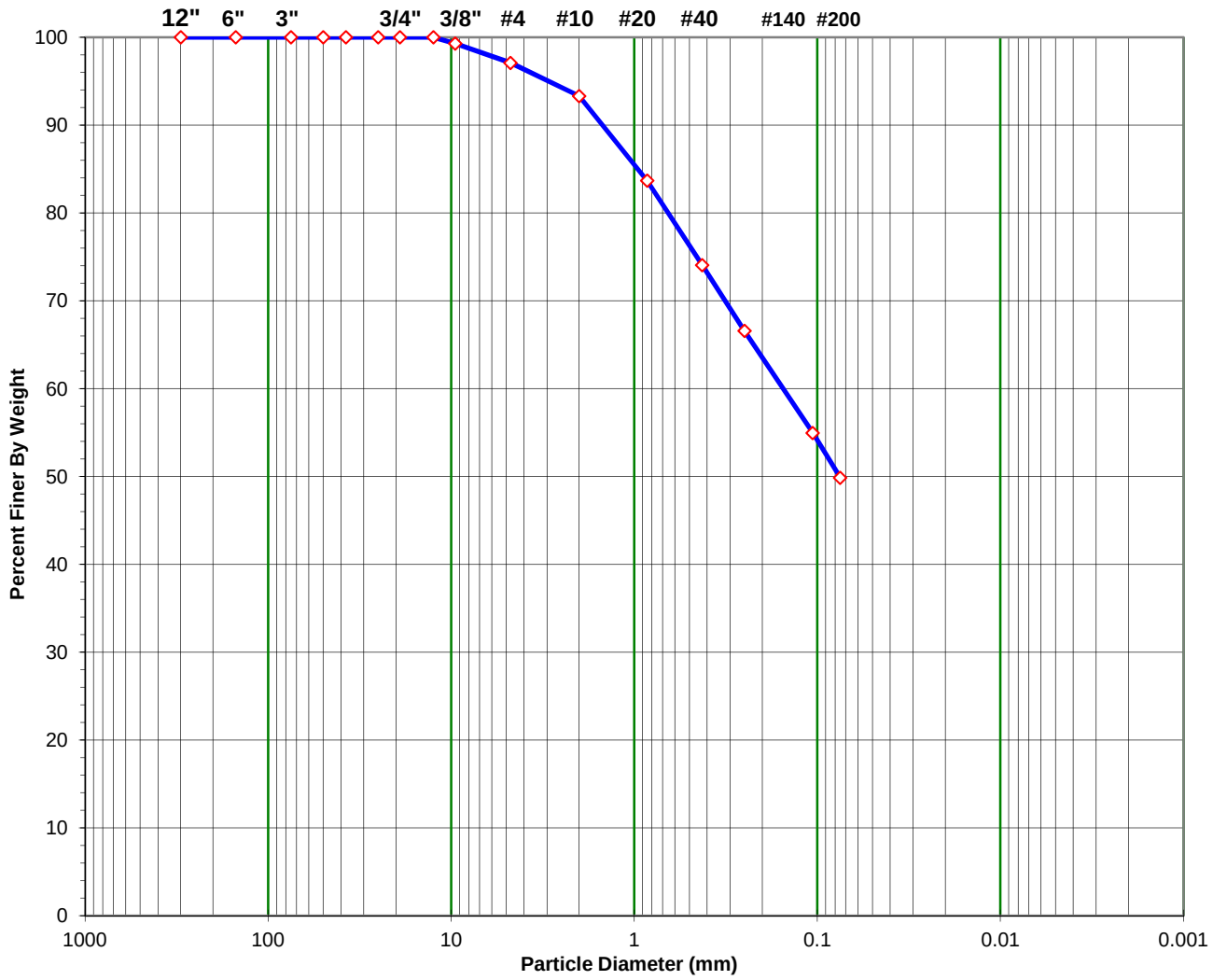
SIEVE ANALYSIS
ASTM D 422-63 (2007)

Area 8 Stockpile

Client	HDR ENGINEERING, INC.	Boring No.	AREA 8
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-04	Sample No.	STOCKPILE
Lab ID	2014-660-04-02	Soil Color	**LIGHT BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SM, TESTED***

USCS Classification SILTY SAND

Tested By	BW	Date	7/11/14	Checked By	GEM	Date	7/14/14

 DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-02 SIEVON REV 4.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	HDR ENGINEERING, INC.	Boring No.	AREA 8
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-04	Sample No.	STOCKPILE
Lab ID	2014-660-04-02	Soil Color	**LIGHT BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	842	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	822.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	694.82	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	255.95	Weight of Tare (gm)	NA
Weight of Water (gm)	127.18	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	438.87	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**29.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	438.87
Dry Weight - 3/4" Sample (gm)	220.0	Weight of minus #200 material (gm)	218.87
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	220.00
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	3.13	0.7	0.7	99.3	**99.3**
#4	4.75	9.63	2.2	2.9	97.1	**97.1**
#10	2.00	16.53	3.8	6.7	93.3	**93.3**
#20	0.850	42.33	9.6	16.3	83.7	**83.7**
#40	0.425	42.20	9.6	25.9	74.1	**74.1**
#60	0.250	32.86	7.5	33.4	66.6	**66.6**
#140	0.106	50.93	11.6	45.0	55.0	**55.0**
#200	0.075	22.39	5.1	50.1	49.9	**49.9**
Pan	-	218.87	49.9	100.0	-	**-**

Tested By BW Date 7/11/14 Checked By GEM Date 7/14/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-02 SIEVON REV 4.xls]Sheet1*

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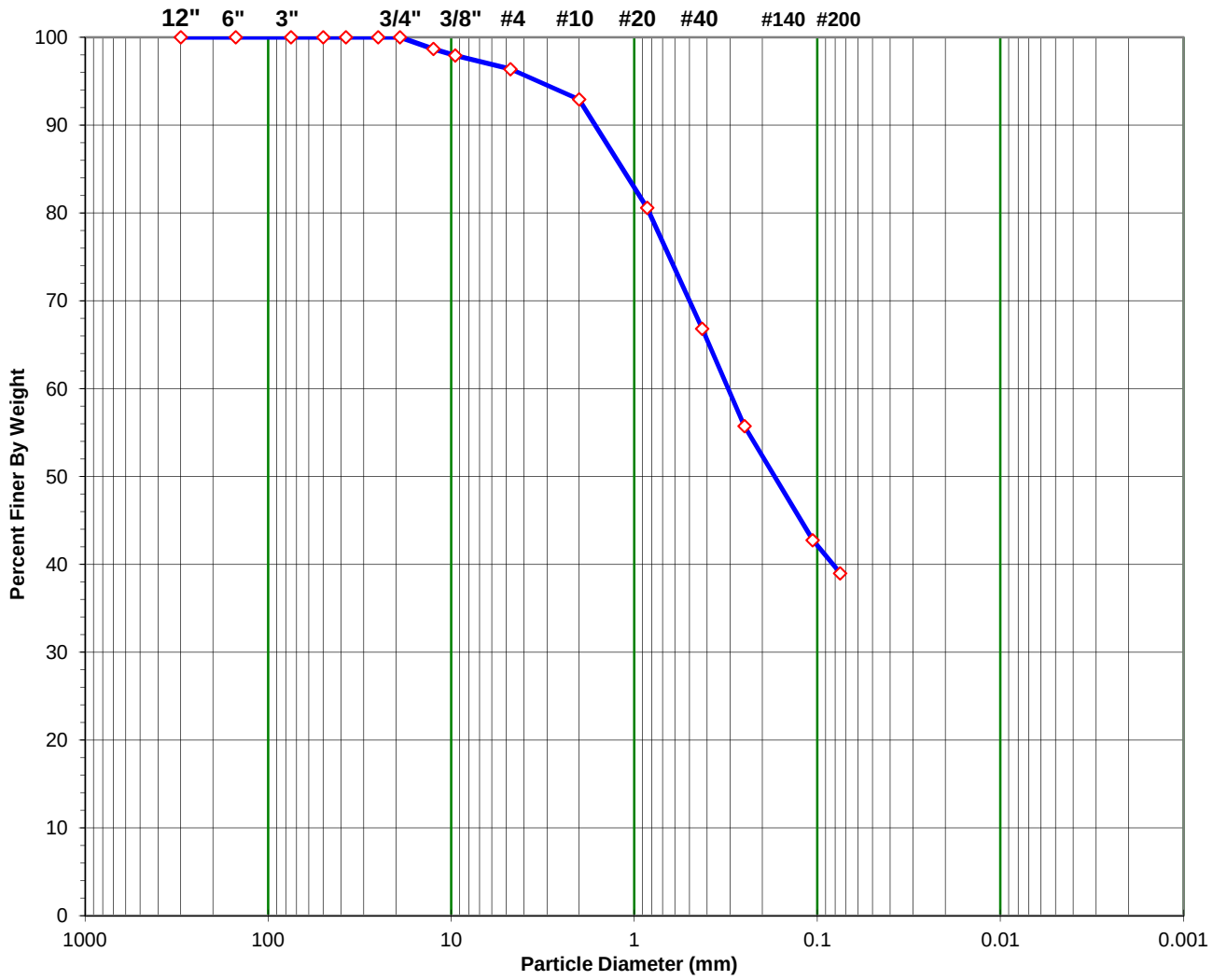
Area 8 Perm
Sample Location

SIEVE ANALYSIS
ASTM D 422-63 (2007)

Client	HDR ENGINEERING, INC.	Boring No.	AREA 8
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-04	Sample No.	SAMPLE 1
Lab ID	2014-660-04-03	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SC-SM, TESTED***

USCS Classification SILTY, CLAYEY SAND

Tested By	BW	Date	7/11/14	Checked By	GEM	Date	7/14/14

 DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-03 SIEVON REV 4.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	HDR ENGINEERING, INC.	Boring No.	AREA 8
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-04	Sample No.	SAMPLE 1
Lab ID	2014-660-04-03	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	840	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	1153.54	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	1097.92	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	262.69	Weight of Tare (gm)	NA
Weight of Water (gm)	55.62	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	835.23	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**6.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	835.23
Dry Weight - 3/4" Sample (gm)	509.6	Weight of minus #200 material (gm)	325.59
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	509.64
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	11.04	1.3	1.3	98.7	**98.7**
3/8"	9.50	6.24	0.7	2.1	97.9	**97.9**
#4	4.75	12.91	1.5	3.6	96.4	**96.4**
#10	2.00	28.80	3.4	7.1	92.9	**92.9**
#20	0.850	103.14	12.3	19.4	80.6	**80.6**
#40	0.425	114.97	13.8	33.2	66.8	**66.8**
#60	0.250	92.67	11.1	44.3	55.7	**55.7**
#140	0.106	108.27	13.0	57.2	42.8	**42.8**
#200	0.075	31.60	3.8	61.0	39.0	**39.0**
Pan	-	325.59	39.0	100.0	-	**-**

Tested By BW Date 7/11/14 Checked By GEM Date 7/14/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-03 SIEVON REV 4.xls]Sheet1*

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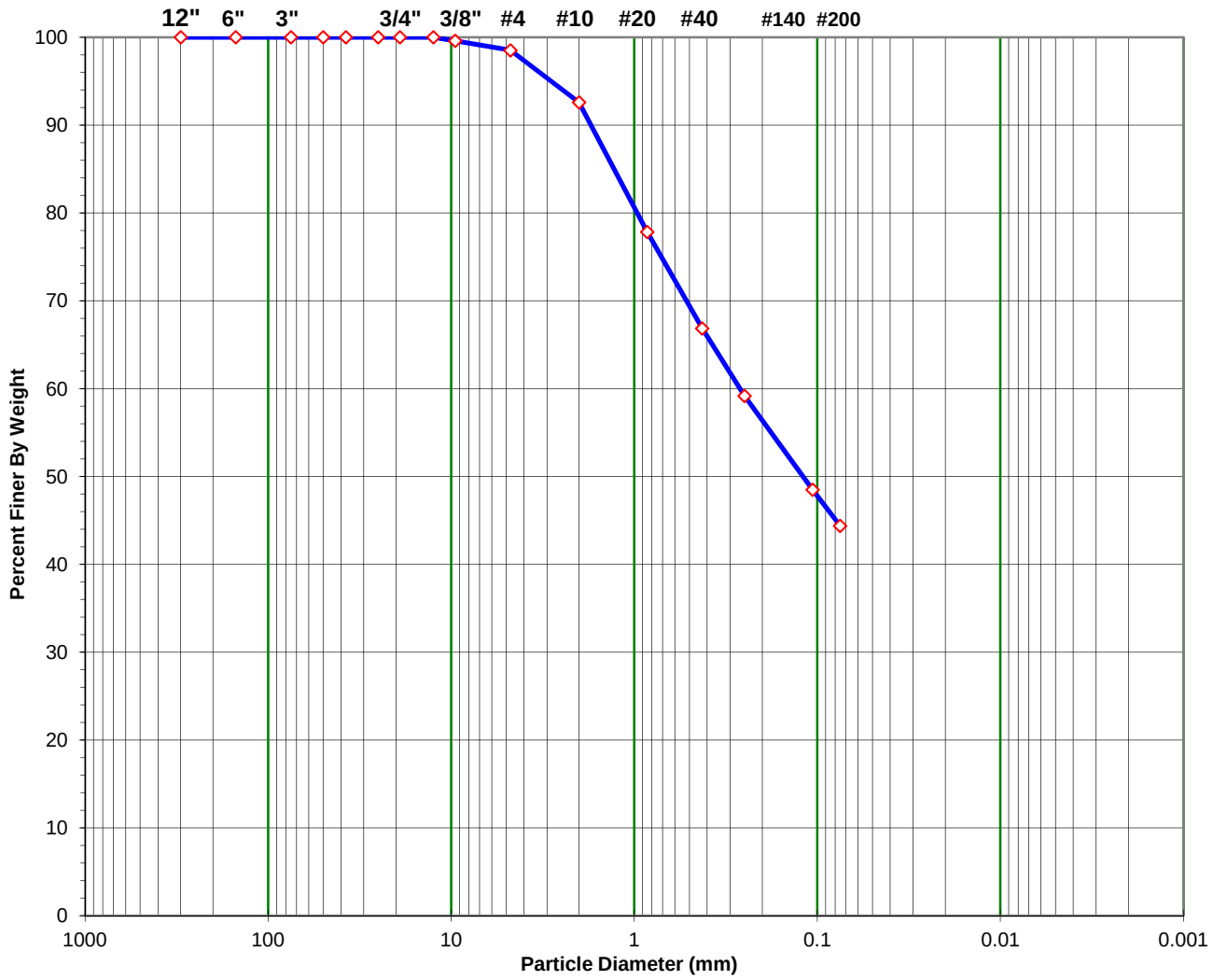
SIEVE ANALYSIS
ASTM D 422-63 (2007)

Area 9

Client	HDR ENGINEERING, INC.	Boring No.	CLAY
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-03	Sample No.	109091
Lab ID	2014-660-03-02	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SC, TESTED***

USCS Classification CLAYEY SAND

Tested By BW Date 6/27/14 Checked By GEM Date 6/30/14

 DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-03-02 SIEVON REV 4.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	HDR ENGINEERING, INC.	Boring No.	CLAY
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-03	Sample No.	109091
Lab ID	2014-660-03-02	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	202	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	927.17	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	836.40	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	197.12	Weight of Tare (gm)	NA
Weight of Water (gm)	90.77	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	639.28	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	639.28
Dry Weight - 3/4" Sample (gm)	355.6	Weight of minus #200 material (gm)	283.66
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	355.62
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	2.60	0.4	0.4	99.6	**99.6**
#4	4.75	6.85	1.1	1.5	98.5	**98.5**
#10	2.00	37.92	5.9	7.4	92.6	**92.6**
#20	0.850	94.25	14.7	22.2	77.8	**77.8**
#40	0.425	70.30	11.0	33.1	66.9	**66.9**
#60	0.250	49.00	7.7	40.8	59.2	**59.2**
#140	0.106	68.36	10.7	51.5	48.5	**48.5**
#200	0.075	26.34	4.1	55.6	44.4	**44.4**
Pan	-	283.66	44.4	100.0	-	**-**

Tested By BW Date 6/27/14 Checked By GEM Date 6/30/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-03-02 SIEVON REV 4.xls]Sheet1*

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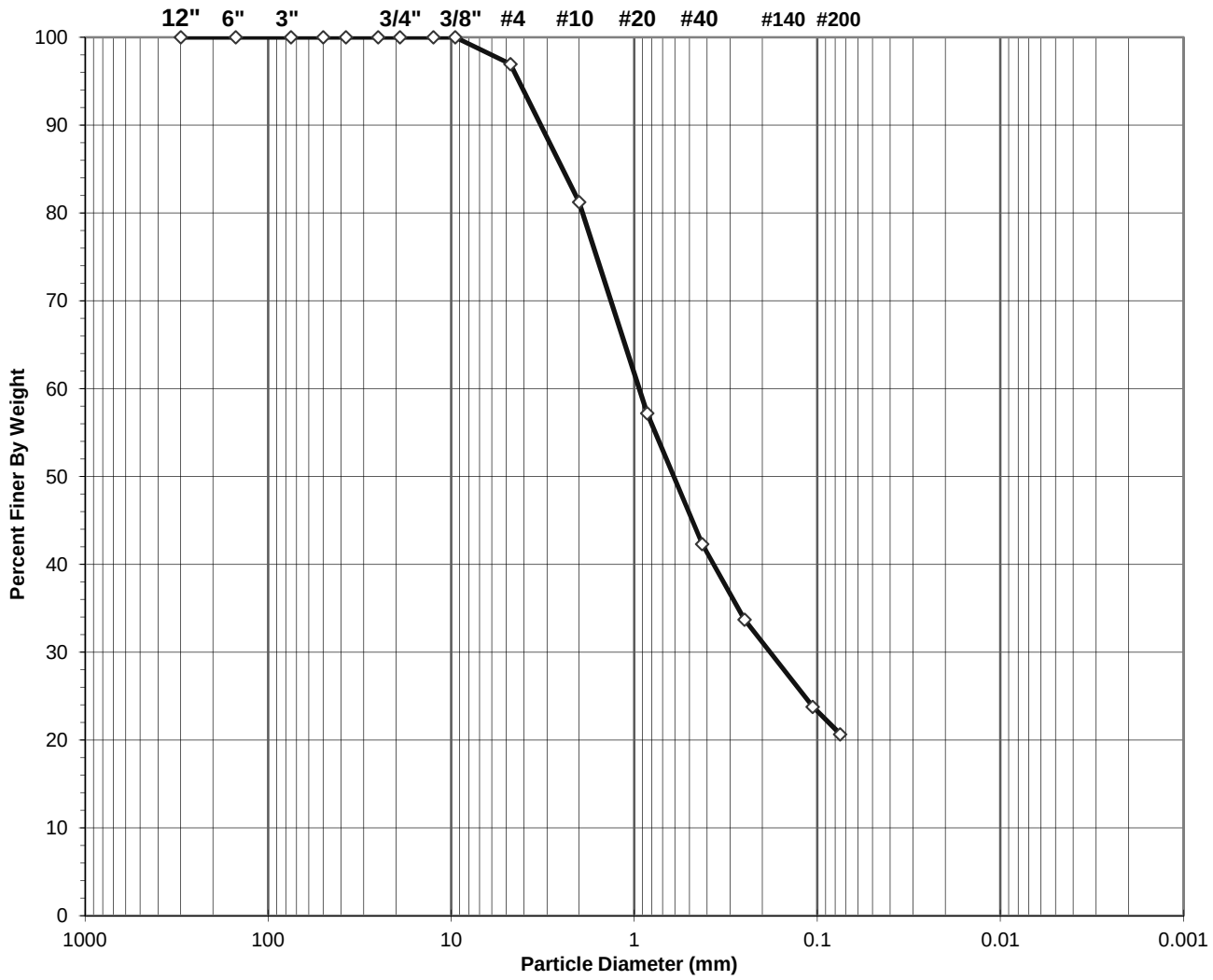
SIEVE ANALYSIS
ASTM D 422-63 (2007)

Area 14

Client	HDR ENGINEERING, INC.	Boring No.	14
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-05	Sample No.	1A
Lab ID	2014-660-05-02	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SC, TESTED***

USCS Classification CLAYEY SAND

Tested By	SFS	Date	8/22/14	Checked By	GEM	Date	8/29/14

 DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-05-02 SIEVON REV 4.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	HDR ENGINEERING, INC.	Boring No.	14
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-05	Sample No.	1A
Lab ID	2014-660-05-02	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	801	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	497.86	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	471.03	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	99.70	Weight of Tare (gm)	NA
Weight of Water (gm)	26.83	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	371.33	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**7.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	371.33
Dry Weight - 3/4" Sample (gm)	294.6	Weight of minus #200 material (gm)	76.74
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	294.59
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	11.27	3.0	3.0	97.0	**97.0**
#10	2.00	58.33	15.7	18.7	81.3	**81.3**
#20	0.850	89.31	24.1	42.8	57.2	**57.2**
#40	0.425	55.33	14.9	57.7	42.3	**42.3**
#60	0.250	31.85	8.6	66.3	33.7	**33.7**
#140	0.106	36.90	9.9	76.2	23.8	**23.8**
#200	0.075	11.60	3.1	79.3	20.7	**20.7**
Pan	-	76.74	20.7	100.0	-	**-**

Tested By SFS Date 8/22/14 Checked By GEM Date 8/29/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-05-02 SIEVON REV 4.xls]Sheet1*

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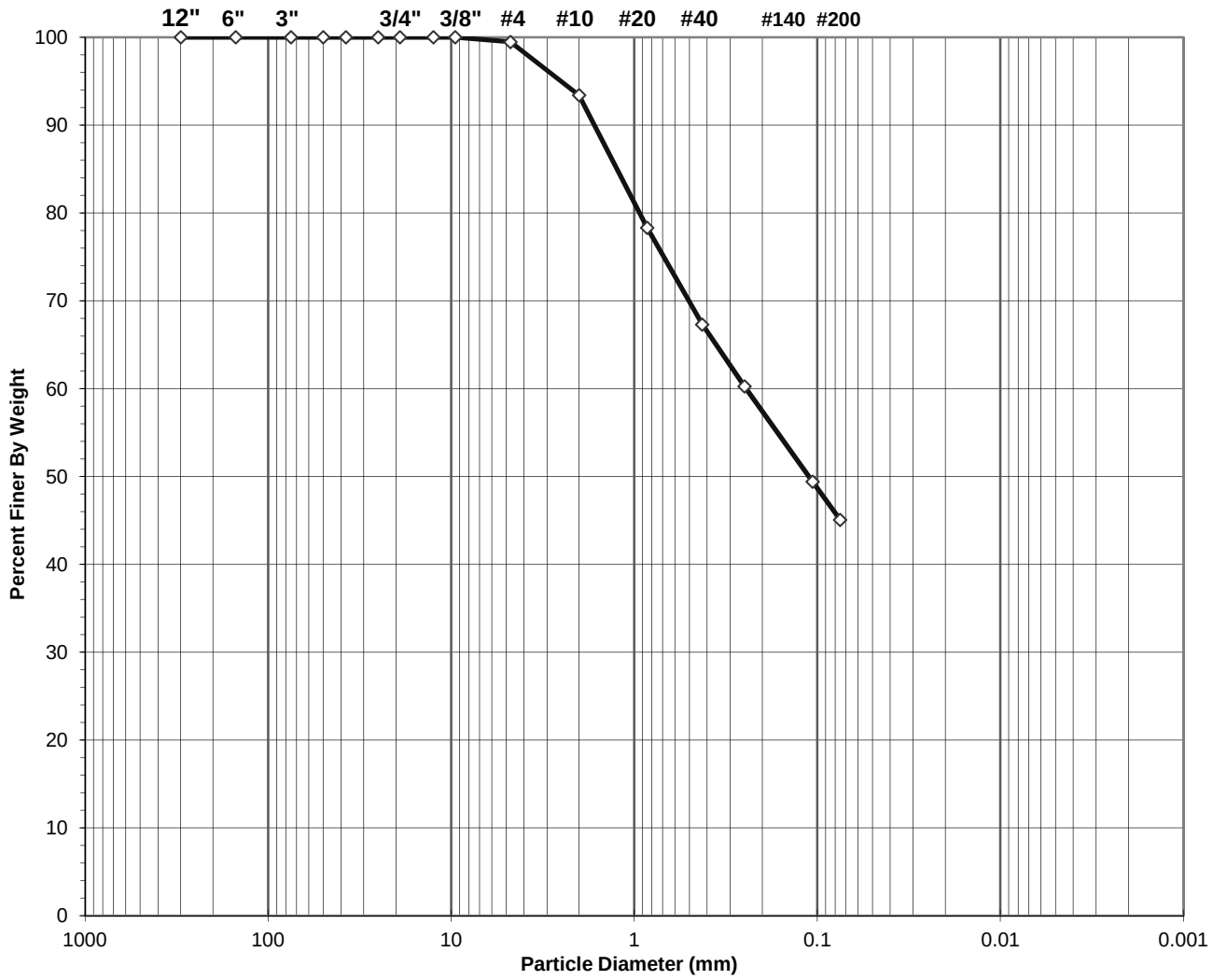
SIEVE ANALYSIS
ASTM D 422-63 (2007)

Area 17

Client	HDR ENGINEERING, INC.	Boring No.	17
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-05	Sample No.	1A
Lab ID	2014-660-05-01	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SC, TESTED***

USCS Classification CLAYEY SAND

Tested By	SFS	Date	8/22/14	Checked By	GEM	Date	8/29/14

 DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-05-01 SIEVON REV 4.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	HDR ENGINEERING, INC.	Boring No.	17
Client Reference	GREENSBORO PH.II, PART 2 CLOSURE	Depth (ft)	NA
Project No.	2014-660-05	Sample No.	1A
Lab ID	2014-660-05-01	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	808	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	479.98	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	427.30	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	103.94	Weight of Tare (gm)	NA
Weight of Water (gm)	52.68	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	323.36	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**16.3**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	323.36
Dry Weight - 3/4" Sample (gm)	177.6	Weight of minus #200 material (gm)	145.76
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	177.60
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.72	0.5	0.5	99.5	**99.5**
#10	2.00	19.59	6.1	6.6	93.4	**93.4**
#20	0.850	48.77	15.1	21.7	78.3	**78.3**
#40	0.425	35.61	11.0	32.7	67.3	**67.3**
#60	0.250	22.83	7.1	39.7	60.3	**60.3**
#140	0.106	35.08	10.8	50.6	49.4	**49.4**
#200	0.075	14.00	4.3	54.9	45.1	**45.1**
Pan	-	145.76	45.1	100.0	-	**-**

Tested By SFS Date 8/22/14 Checked By GEM Date 8/29/14

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-05-01 SIEVON REV 4.xls]Sheet1*

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B4

Hydraulic Conductivity

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FLEXIBLE WALL PERMEABILITY TEST

PERMOMETER METHOD

ASTM D 5084-10

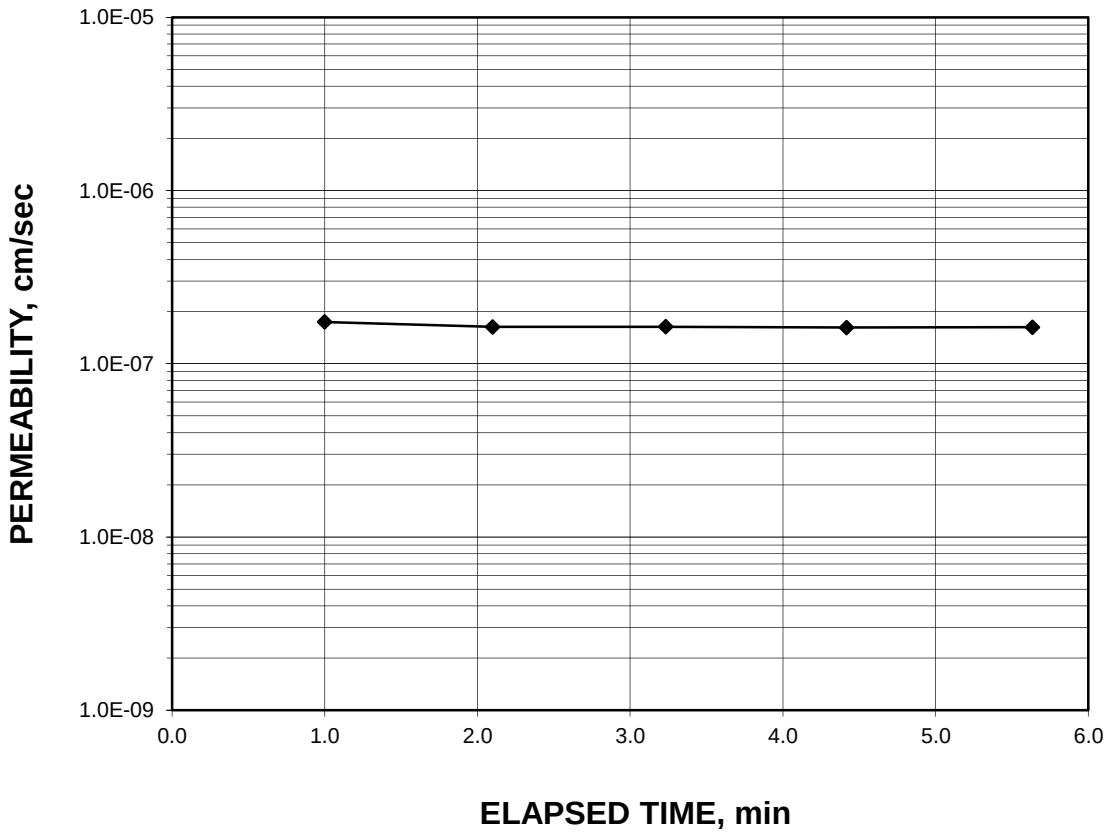
Test Pad for On-Site Material Area 1

Client	HDR ENGINEERING	Boring No.	TST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 1
Project No.	2014-660-01	Sample No.	ST-TP-01
Lab ID No.	2014-660-01-01		

Visual Description: RED SILTY CLAY

AVERAGE PERMEABILITY = 1.6E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.6E-09 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-01 Permometer.xls]Sheet1

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PERMOMETER METHOD
ASTM D 5084-10

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Client	HDR ENGINEERING	Boring No.	TST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 1
Project No.	2014-660-01	Sample No.	ST-TP-01
Lab ID No.	2014-660-01-01		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: RED SILTY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	812	825
Wt. of Tare & WS (gm.)	344.89	319.88
Wt. of Tare & DS (gm.)	290.51	273.41
Wt. of Tare (gm.)	106.93	137.51
Wt. of Water (gm.)	54.38	46.47
Wt. of DS (gm.)	183.58	135.90
Moisture Content (%)	**29.6**	**34.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	505.01	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	505.01	522.82
Length 1 (in.)	2.611	2.579
Length 2 (in.)	2.581	2.574
Length 3 (in.)	2.588	2.587
Top Diameter (in.)	2.856	2.869
Middle Diameter (in.)	2.861	2.869
Bottom Diameter (in.)	2.862	2.870
Average Length (in.)	2.59	2.58
Average Area (in.^{2})	6.42	6.47
Sample Volume (cm^3)	272.95	273.38
Unit Wet Wt. (gm./ cm^3)	1.850	1.912
Unit Wet Wt. (pcf)	115.5	119.4
Unit Dry Wt. (pcf)	89.1	89.0
Unit Dry Wt. (gm./ cm^3)	1.427	1.425
Void Ratio, e	0.892	0.895
Porosity, n	0.471	0.472
Pore Volume (cm^3)	128.7	129.1
Total Wt. Of Sample After Test		511.80

Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-01 Permometer.xls]Sheet1

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PERMOMETER METHOD

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Client	HDR ENGINEERING	Boring No.	TST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 1
Project No.	2014-660-01	Sample No.	ST-TP-01
Lab ID No.	2014-660-01-01		

Test Pressures		Final Sample Dimensions	
Cell Pressure(psi)	50.0	Sample Length (cm), L	6.55
Back Pressure(psi)	40.0	Sample Area (cm^2), A	41.72
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	96	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1.1

AVERAGE PERMEABILITY = 1.6E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 1.6E-09 m/sec @ 20°C

DATE		TIME			ELAPSED TIME **t**	PIPETTE READI NG **R_p**	INCREMENT GRADIENT **i**	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
4/3/14	10	34	18	34.30	0.000	8.0	13.8	22.6	NA
4/3/14	10	35	18	35.30	1.000	7.8	13.4	22.6	1.7E-07
4/3/14	10	36	24	36.40	2.100	7.6	13.0	22.6	1.6E-07
4/3/14	10	37	32	37.53	3.233	7.4	12.6	22.5	1.6E-07
4/3/14	10	38	43	38.72	4.417	7.2	12.2	22.5	1.6E-07
4/3/14	10	39	56	39.93	5.633	7.0	11.8	22.5	1.6E-07

Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-01 Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST

PERMOMETER METHOD

ASTM D 5084-10

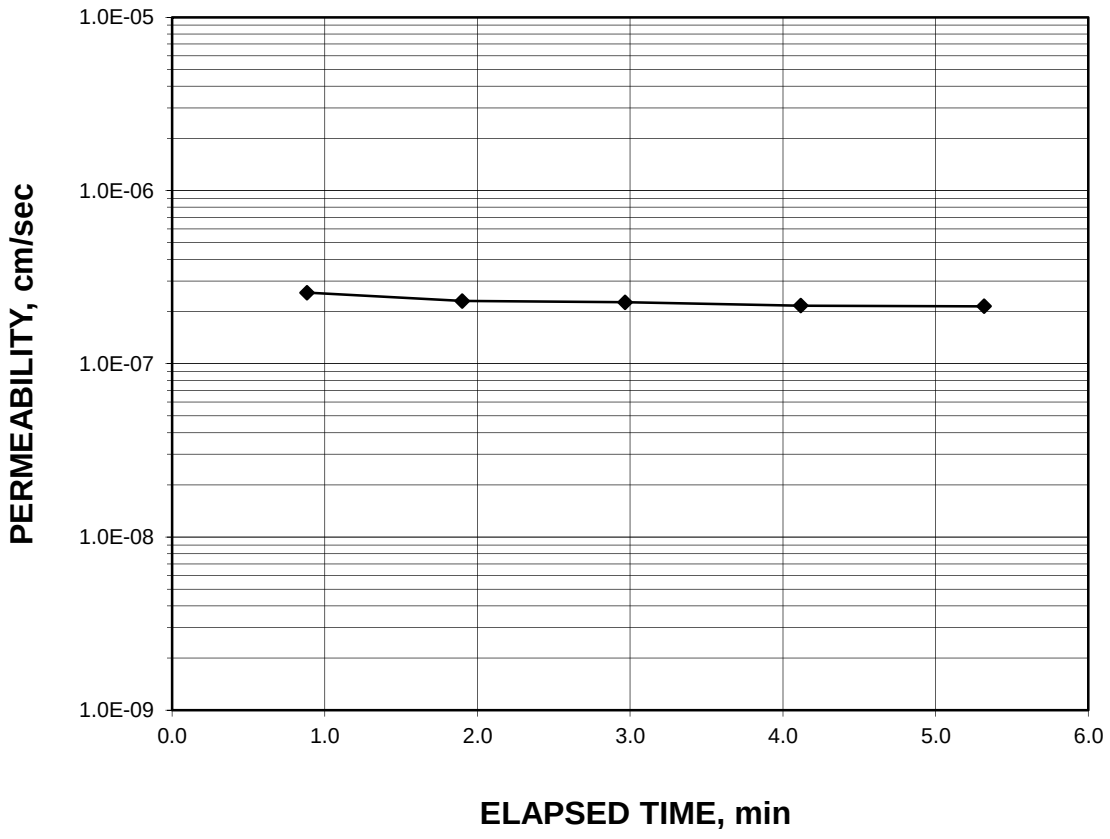
Test Pad for On-Site Material Area 1

Client	HDR ENGINEERING	Boring No.	TST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 2
Project No.	2014-660-01	Sample No.	ST-TP-02
Lab ID No.	2014-660-01-02		

Visual Description: RED SILTY CLAY

AVERAGE PERMEABILITY = 2.2E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.2E-09 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-02 Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST
PERMOMETER METHOD
ASTM D 5084-10

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Client	HDR ENGINEERING	Boring No.	TST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 2
Project No.	2014-660-01	Sample No.	ST-TP-02
Lab ID No.	2014-660-01-02		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: RED SILTY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	805	815
Wt. of Tare & WS (gm.)	331.99	333.25
Wt. of Tare & DS (gm.)	279.75	286.33
Wt. of Tare (gm.)	104.45	137.49
Wt. of Water (gm.)	52.24	46.92
Wt. of DS (gm.)	175.30	148.84
Moisture Content (%)	**29.8**	**31.5**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	649.47	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	649.47	658.09
Length 1 (in.)	3.317	3.302
Length 2 (in.)	3.346	3.364
Length 3 (in.)	3.332	3.334
Top Diameter (in.)	2.863	2.860
Middle Diameter (in.)	2.867	2.855
Bottom Diameter (in.)	2.869	2.851
Average Length (in.)	3.33	3.33
Average Area (in.^{2})	6.45	6.40
Sample Volume (cm^3)	352.29	349.77
Unit Wet Wt. (gm./ cm^3)	1.844	1.881
Unit Wet Wt. (pcf)	115.1	117.4
Unit Dry Wt. (pcf)	88.7	89.3
Unit Dry Wt. (gm./ cm^3)	1.420	1.431
Void Ratio, e	0.901	0.887
Porosity, n	0.474	0.470
Pore Volume (cm^3)	167.0	164.5
Total Wt. Of Sample After Test		659.90

Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-02 Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST
PERMOMETER METHOD
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Client	HDR ENGINEERING	Boring No.	TST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 2
Project No.	2014-660-01	Sample No.	ST-TP-02
Lab ID No.	2014-660-01-02		

Test Pressures		Final Sample Dimensions	
Cell Pressure(psi)	50.0	Sample Length (cm), L	8.47
Back Pressure(psi)	40.0	Sample Area (cm^2), A	41.31
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	96	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1.1

AVERAGE PERMEABILITY = 2.2E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.2E-09 m/sec @ 20°C

DATE		TIME			ELAPSED TIME **t**	PIPETTE READI NG **R_p**	INCREMENT GRADIENT **i**	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
4/3/14	10	22	4	22.07	0.000	8.0	10.6	22.6	NA
4/3/14	10	22	57	22.95	0.883	7.8	10.3	22.6	2.6E-07
4/3/14	10	23	58	23.97	1.900	7.6	10.0	22.6	2.3E-07
4/3/14	10	25	2	25.03	2.967	7.4	9.7	22.6	2.3E-07
4/3/14	10	26	11	26.18	4.117	7.2	9.4	22.6	2.2E-07
4/3/14	10	27	23	27.38	5.317	7.0	9.1	22.6	2.1E-07

Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-02 Permometer.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-10

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Client	HDR ENGINEERING	Boring No.	TEST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 3
Project No.	2014-660-01	Sample No.	ST-TP-03
Lab ID No.	2014-660-01-03		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: RED SILTY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	8010	827
Wt. of Tare & WS (gm.)	361.53	353.67
Wt. of Tare & DS (gm.)	300.20	295.76
Wt. of Tare (gm.)	133.49	139.21
Wt. of Water (gm.)	61.33	57.91
Wt. of DS (gm.)	166.71	156.55
Moisture Content (%)	**36.8**	**37.0**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	587.63	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.)(gm.)	587.63	588.50
Length 1 (in.)	3.186	3.162
Length 2 (in.)	3.175	3.172
Length 3 (in.)	3.205	3.178
Top Diameter (in.)	2.826	2.850
Middle Diameter (in.)	2.831	2.861
Bottom Diameter (in.)	2.826	2.864
Average Length (in.)	3.19	3.17
Average Area (in.^{2})	6.28	6.42
Sample Volume (cm^3)	328.14	333.40
Unit Wet Wt. (gm./ cm^3)	1.79	1.77
Unit Wet Wt. (pcf)	111.8	110.2
Unit Dry Wt. (pcf)	81.7	80.4
Unit Dry Wt. (gm./ cm^3)	1.31	1.29
Void Ratio, e	1.06	1.10
Porosity, n	0.52	0.52
Pore Volume (cm^3)	169.0	174.3
Total Wgt. Of Sample After Test		600.41

Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22 DATE: 2/2/10 REVISION: 9 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-03 PERMflow.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-03

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Test Pad for
On-Site Material
Area 1

Client	HDR ENGINEERING	Boring No.	TEST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 3
Project No.	2014-660-01	Sample No.	ST-TP-03
Lab ID No.	2014-660-01-03		

Pressure Heads (Constant)		Final Sample Dimensions	
Top Cap (psi)	38.5	Sample Length (cm), L	8.05
Bottom Cap (psi)	40.0	Sample Diameter (cm)	7.26
Cell (psi)	50.0	Sample Area (cm^2), A	41.40
Total Pressure Head (cm)	105.5	Inflow Burette Area (cm^2), a-in	0.897
Hydraulic Gradient	13.09	Outflow Burette Area (cm^2), a-out	0.894
		B Parameter (%)	97

AVERAGE PERMEABILITY = 2.5E-06 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.5E-08 m/sec @ 20°C

DATE (mm/dd/yy)	TIME (hr)	TIME (min)	ELAPSED TIME **t** (hr)	TOTAL INFLOW (cm^3)	TOTAL OUTFLOW (cm^3)	TOTAL HEAD **h** (cm)	FLOW (0 flow) (1 stop)	TEMP. (°C)	INCREMENTAL PERMEABILITY @ 20°C (cm/sec)
9/9/14	11	9	0.00	0.0	0.0	122.0	0	22.6	NA
9/9/14	11	12	0.05	0.3	0.3	121.3	0	22.6	2.5E-06
9/9/14	11	15	0.10	0.6	0.6	120.6	0	22.6	2.5E-06
9/9/14	11	18	0.15	0.9	0.9	120.0	0	22.6	2.5E-06
9/9/14	11	21	0.20	1.2	1.2	119.3	1	22.6	2.5E-06

Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22 DATE: 2/2/10 REVISION: 9 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-03 PERMflow.xls]Sheet1

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PERMEABILITY TEST

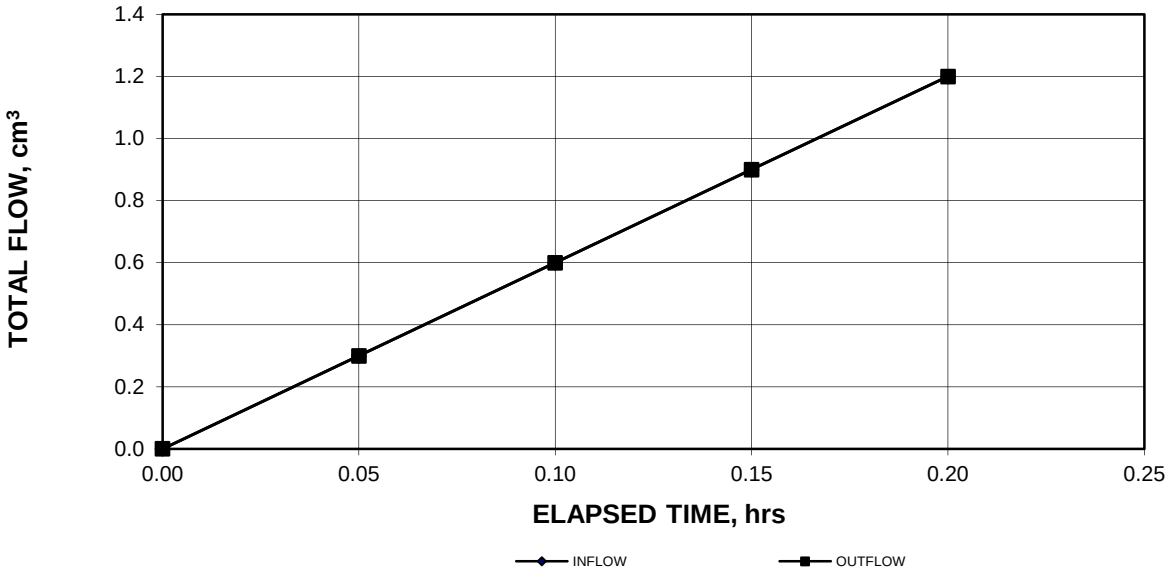
ASTM D 5084-03

Client	HDR ENGINEERING	Boring No.	TEST PAD
Client Project	GREENSBORO PH. II, PART 2 CLOSURE	Depth (ft.)	LIFT 3
Project No.	2014-660-01	Sample No.	ST-TP-03
Lab ID No.	2014-660-01-03		

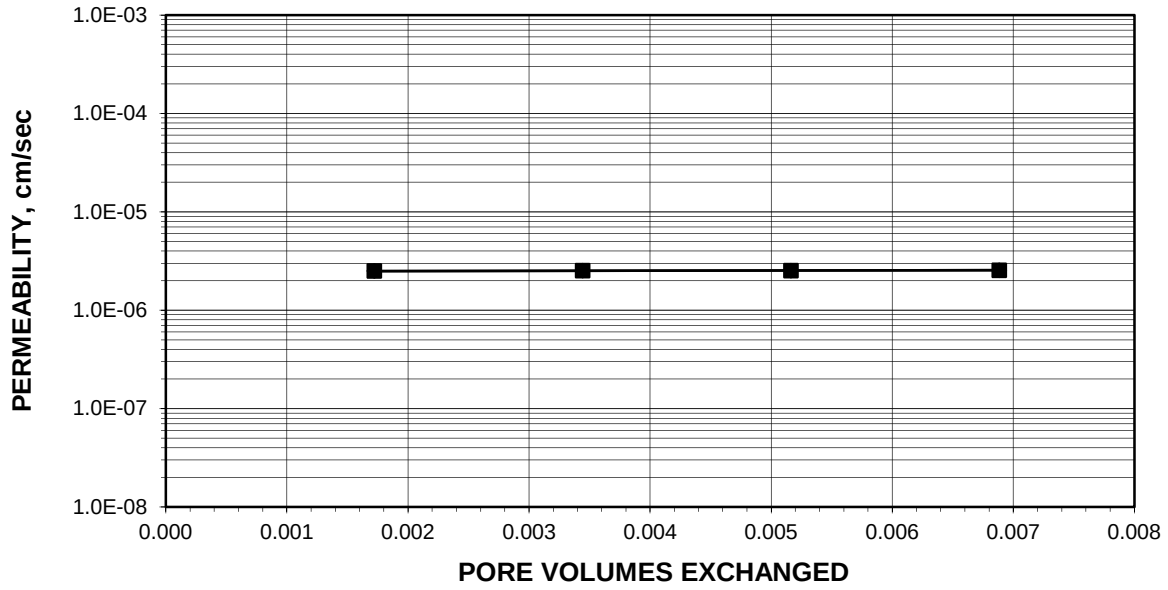
AVERAGE PERMEABILITY = 2.5E-06 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.5E-08 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: BW Date: 4/2/14 Checked By: GEM Date: 4/7/14

DCN: CT-22 DATE: 2/2/10 REVISION: 9 T:\2014 PROJECTS\2014-660 HDR\[2014-660-01-03 PERMflow.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST

PERMOMETER METHOD

ASTM D 5084-10

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Test Pad for
Off-Site Material
Area 5

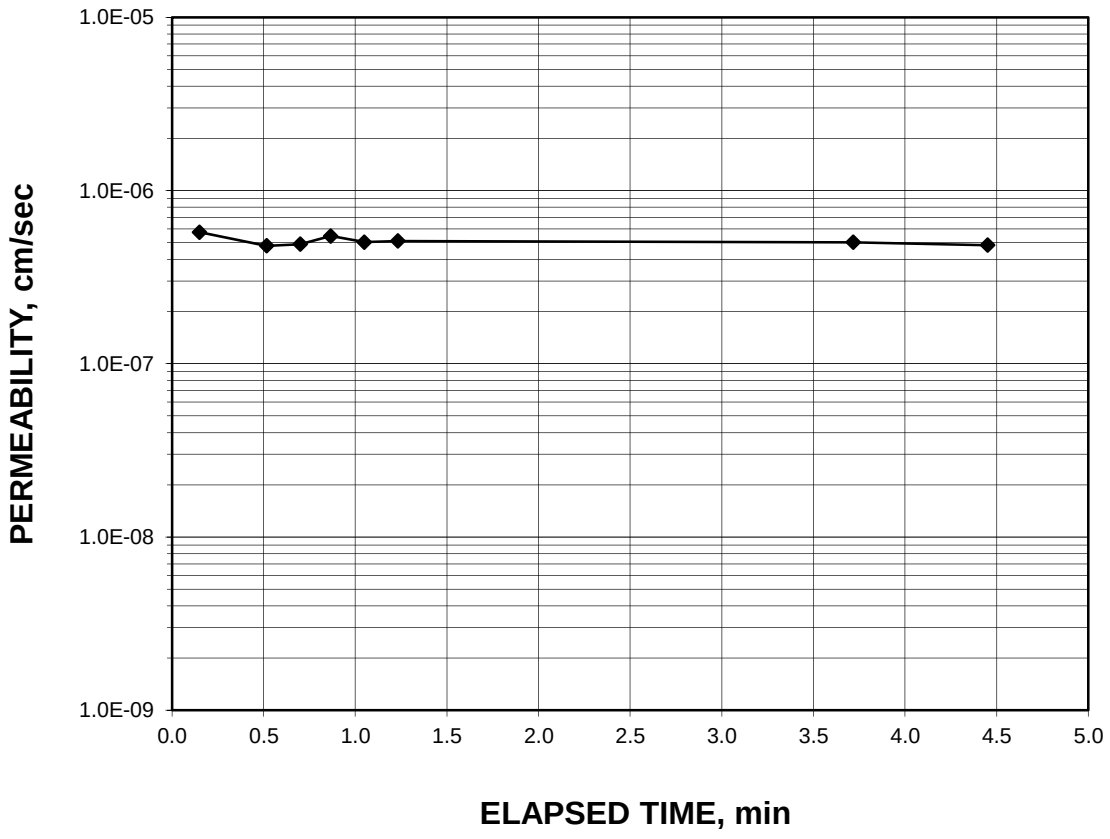
Client	HDR ENGINEERING, INC.	Boring No.	TP-2
Client Project	GREENSBORO PHASE II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-02	Sample No.	LIFT 1
Lab ID No.	2014-660-02-02		

Visual Description: BROWN SANDY CLAY

AVERAGE PERMEABILITY = 5.0E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.0E-09 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: SFS Date: 5/30/14 Checked By: GEM Date: 6/3/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-02-02A Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST
PERMOMETER METHOD
ASTM D 5084-10

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Client	HDR ENGINEERING, INC.	Boring No.	TP-2
Client Project	GREENSBORO PHASE II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-02	Sample No.	LIFT 1
Lab ID No.	2014-660-02-02		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: BROWN SANDY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	8010	8
Wt. of Tare & WS (gm.)	433.95	319.87
Wt. of Tare & DS (gm.)	391.18	275.46
Wt. of Tare (gm.)	133.59	36.48
Wt. of Water (gm.)	42.77	44.41
Wt. of DS (gm.)	257.59	238.98
Moisture Content (%)	**16.6**	**18.6**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	570.79	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	570.79	580.48
Length 1 (in.)	2.758	2.736
Length 2 (in.)	2.755	2.724
Length 3 (in.)	2.765	2.758
Top Diameter (in.)	2.835	2.846
Middle Diameter (in.)	2.811	2.836
Bottom Diameter (in.)	2.833	2.846
Average Length (in.)	2.76	2.74
Average Area (in.^{2})	6.27	6.35
Sample Volume (cm^3)	283.69	284.90
Unit Wet Wt. (gm./ cm^3)	2.012	2.038
Unit Wet Wt. (pcf)	125.6	127.2
Unit Dry Wt. (pcf)	107.7	107.3
Unit Dry Wt. (gm./ cm^3)	1.726	1.718
Void Ratio, e	0.565	0.571
Porosity, n	0.361	0.364
Pore Volume (cm^3)	102.4	103.6
Total Wt. Of Sample After Test		586.80

Tested By: SFS Date: 5/30/14 Checked By: GEM Date: 6/3/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-02-02A Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST
PERMOMETER METHOD

ASTM D 5084-10

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Client	HDR ENGINEERING, INC.	Boring No.	TP-2
Client Project	GREENSBORO PHASE II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-02	Sample No.	LIFT 1
Lab ID No.	2014-660-02-02		

Test Pressures		**Final Sample Dimensions**	
Cell Pressure(psi)	50.0	Sample Length (cm), L	6.96
Back Pressure(psi)	40.0	Sample Area (cm^2), A	40.95
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	99	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1

AVERAGE PERMEABILITY = 5.0E-07 cm/sec @ 20°C

AVERAGE PERMEABILITY = 5.0E-09 m/sec @ 20°C

DATE			TIME		ELAPSED TIME **t**	PIPETTE READI NG **R_p**	INCREMENT GRADIENT **i**	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
6/2/14	10	44	57	44.95	0.000	8.4	13.9	23.1	NA
6/2/14	10	45	6	45.10	0.150	8.3	13.7	23.1	5.7E-07
6/2/14	10	45	28	45.47	0.517	8.1	13.3	23.1	4.8E-07
6/2/14	10	45	39	45.65	0.700	8.0	13.1	23.1	4.9E-07
6/2/14	10	45	49	45.82	0.867	7.9	13.0	23.1	5.5E-07
6/2/14	10	46	0	46.00	1.050	7.8	12.8	23.1	5.0E-07
6/2/14	10	46	11	46.18	1.233	7.7	12.6	23.1	5.1E-07
6/2/14	10	48	40	48.67	3.717	6.5	10.3	23.1	5.0E-07
6/2/14	10	49	24	49.40	4.450	6.2	9.8	23.1	4.8E-07

Tested By: SFS Date: 5/30/14 Checked By: GEM Date: 6/3/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-02-02A Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST

PERMOMETER METHOD

ASTM D 5084-10

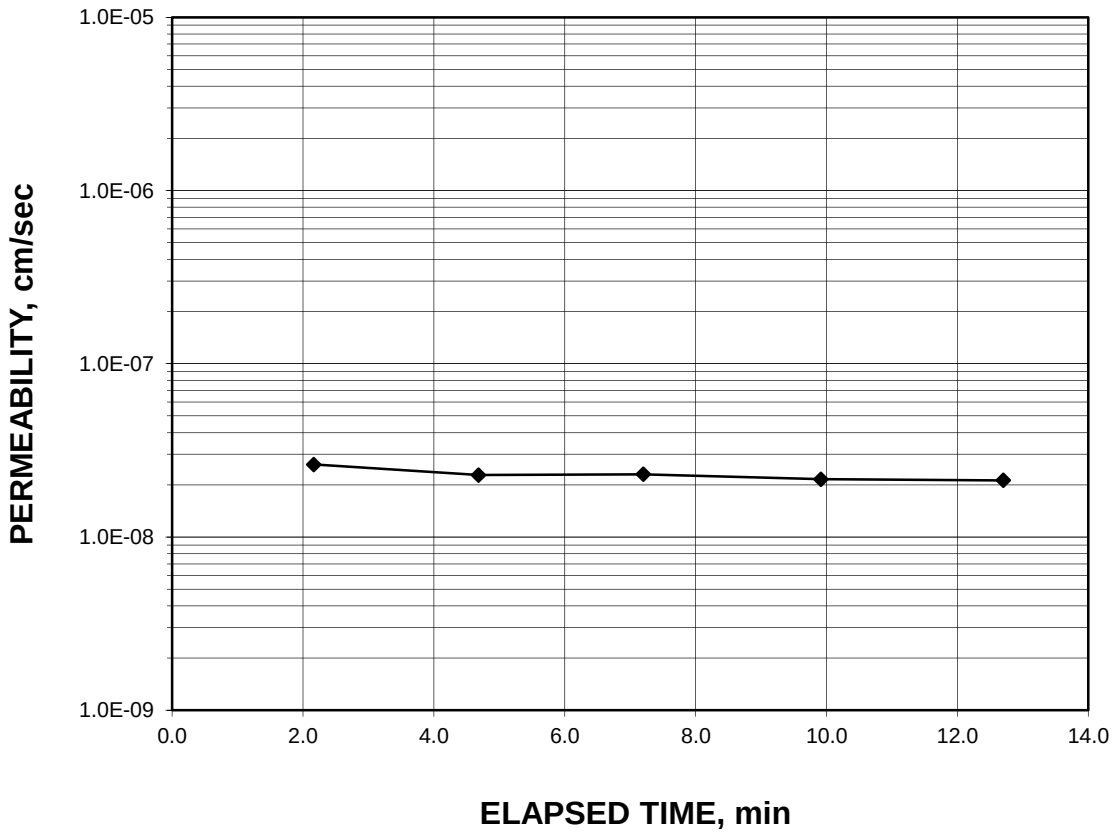
Test Pad for Off-Site Material Area 5

Client	HDR ENGINEERING, INC.	Boring No.	TP-2
Client Project	GREENSBORO PHASE II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-02	Sample No.	LIFT 2
Lab ID No.	2014-660-02-02		

Visual Description: BROWN SANDY CLAY

AVERAGE PERMEABILITY = 2.2E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.2E-10 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: SFS Date: 5/30/14 Checked By: GEM Date: 6/3/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-02-02B Permometer.xls]Sheet1

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Client	HDR ENGINEERING, INC.	Boring No.	TP-2
Client Project	GREENSBORO PHASE II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-02	Sample No.	LIFT 2
Lab ID No.	2014-660-02-02		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: BROWN SANDY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	8010	815
Wt. of Tare & WS (gm.)	433.95	380.41
Wt. of Tare & DS (gm.)	391.18	340.4
Wt. of Tare (gm.)	133.59	137.45
Wt. of Water (gm.)	42.77	40.01
Wt. of DS (gm.)	257.59	202.95
Moisture Content (%)	**16.6**	**19.7**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	538.77	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	538.77	553.14
Length 1 (in.)	2.528	2.480
Length 2 (in.)	2.523	2.504
Length 3 (in.)	2.541	2.510
Top Diameter (in.)	2.844	2.867
Middle Diameter (in.)	2.841	2.853
Bottom Diameter (in.)	2.838	2.814
Average Length (in.)	2.53	2.50
Average Area (in.^{2})	6.34	6.36
Sample Volume (cm^3)	262.89	260.16
Unit Wet Wt. (gm./ cm^3)	2.049	2.126
Unit Wet Wt. (pcf)	127.9	132.7
Unit Dry Wt. (pcf)	109.7	110.9
Unit Dry Wt. (gm./ cm^3)	1.758	1.776
Void Ratio, e	0.536	0.520
Porosity, n	0.349	0.342
Pore Volume (cm^3)	91.8	89.0
Total Wt. Of Sample After Test		545.77

Tested By: SFS Date: 5/30/14 Checked By: GEM Date: 6/3/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-02-02B Permometer.xls]Sheet1

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Client	HDR ENGINEERING, INC.	Boring No.	TP-2
Client Project	GREENSBORO PHASE II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-02	Sample No.	LIFT 2
Lab ID No.	2014-660-02-02		

Test Pressures		**Final Sample Dimensions**	
Cell Pressure(psi)	50.0	Sample Length (cm), L	6.34
Back Pressure(psi)	40.0	Sample Area (cm^2), A	41.00
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	100	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1

AVERAGE PERMEABILITY = 2.2E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.2E-10 m/sec @ 20°C

DATE		TIME			ELAPSED TIME **t**	PIPETTE READI NG **R_p**	INCREMENT GRADIENT **i**	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
6/2/14	11	3	11	3.18	0.000	11.2	21.0	23.1	NA
6/2/14	11	5	21	5.35	2.167	11.1	20.8	23.1	2.6E-08
6/2/14	11	7	52	7.87	4.683	11.0	20.6	23.1	2.3E-08
6/2/14	11	10	23	10.38	7.200	10.9	20.4	23.1	2.3E-08
6/2/14	11	13	6	13.10	9.917	10.8	20.2	23.1	2.2E-08
6/2/14	11	15	53	15.88	12.700	10.7	20.0	23.1	2.1E-08

Tested By: SFS Date: 5/30/14 Checked By: GEM Date: 6/3/14

DCN: CT-22A DATE:2-2-10 REVISION: 5 T:\2014 PROJECTS\2014-660 HDR\[2014-660-02-02B Permometer.xls]Sheet1

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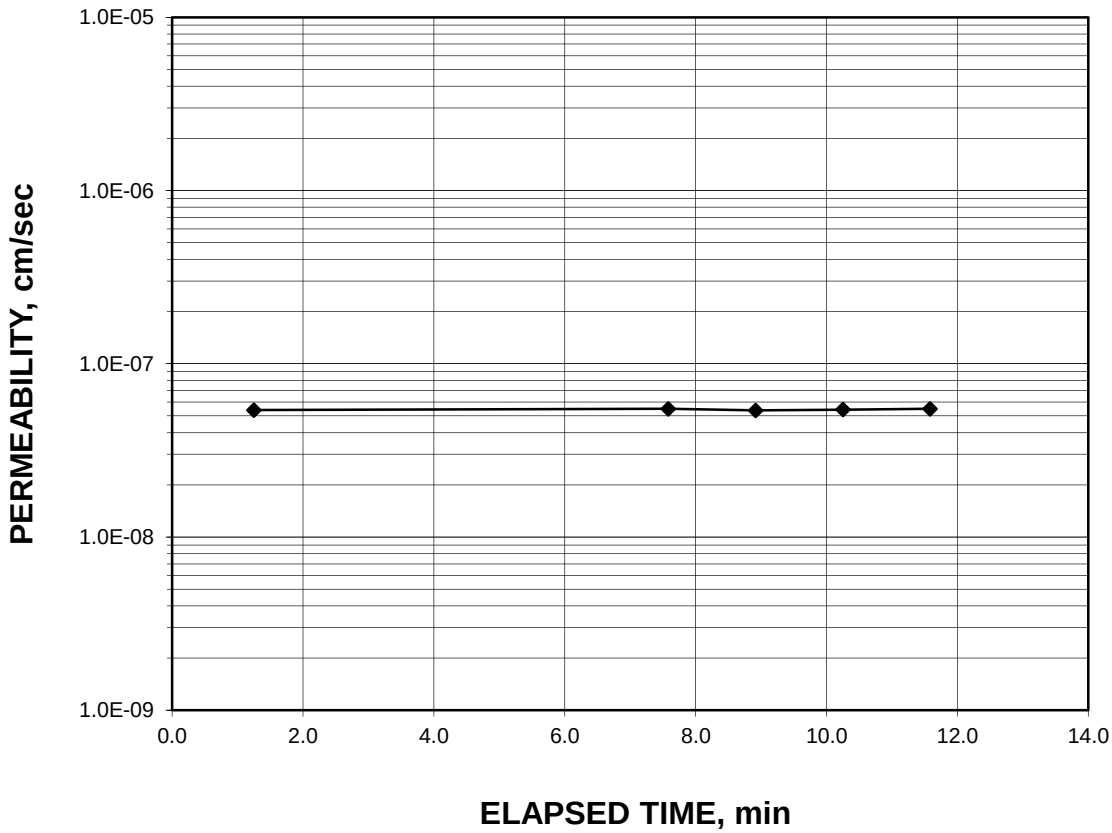
Area 8

Client	HDR ENGINEERING, INC.	Boring No.	AREA A
Client Project	GREENSBORO PH II, PART 2 CLOSURE	Depth (ft.)	NA
Project No.	2014-660-04	Sample No.	1B
Lab ID No.	2014-660-04-01		

Visual Description: TAN CLAYEY SAND

AVERAGE PERMEABILITY = 5.4E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.4E-10 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: SFS Date: 7/10/14 Checked By: GEM Date: 7/14/14

DCN: CT-22A DATE:2-2-10 REVISION:05 T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-01 Permometer.xls]Sheet1

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Client	HDR ENGINEERING, INC.	Boring No.	AREA A
Client Project	GREENSBORO PH II, PART 2 CLOSURE	Depth (ft.)	NA
Project No.	2014-660-04	Sample No.	1B
Lab ID No.	2014-660-04-01		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: TAN CLAYEY SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	806	808
Wt. of Tare & WS (gm.)	460.30	444.56
Wt. of Tare & DS (gm.)	431.41	397.01
Wt. of Tare (gm.)	100.45	104
Wt. of Water (gm.)	28.89	47.55
Wt. of DS (gm.)	330.96	293.01
Moisture Content (%)	**8.7**	**16.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	653.11	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	653.11	698.15
Length 1 (in.)	3.002	2.989
Length 2 (in.)	3.019	3.025
Length 3 (in.)	3.028	3.035
Top Diameter (in.)	2.858	2.855
Middle Diameter (in.)	2.835	2.844
Bottom Diameter (in.)	2.821	2.881
Average Length (in.)	3.02	3.02
Average Area (in.^{2})	6.33	6.42
Sample Volume (cm^3)	312.68	317.54
Unit Wet Wt. (gm./ cm^3)	2.089	2.199
Unit Wet Wt. (pcf)	130.4	137.2
Unit Dry Wt. (pcf)	119.9	118.1
Unit Dry Wt. (gm./ cm^3)	1.921	1.892
Void Ratio, e	0.405	0.427
Porosity, n	0.288	0.299
Pore Volume (cm^3)	90.2	95.1
Total Wt. Of Sample After Test		681.43

Tested By: SFS Date: 7/10/14 Checked By: GEM Date: 7/14/14

DCN: CT-22A DATE:2-2-10 REVISION:2 T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-01 Permometer.xls]Sheet1

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Client	HDR ENGINEERING, INC.	Boring No.	AREA A
Client Project	GREENSBORO PH II, PART 2 CLOSURE	Depth (ft.)	NA
Project No.	2014-660-04	Sample No.	1B
Lab ID No.	2014-660-04-01		

Test Pressures		Final Sample Dimensions	
Cell Pressure(psi)	50.0	Sample Length (cm), L	7.66
Back Pressure(psi)	40.0	Sample Area (cm^2), A	41.45
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	98	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1

AVERAGE PERMEABILITY = 5.4E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.4E-10 m/sec @ 20°C

DATE		TIME			ELAPSED TIME **t**	PIPETTE READI NG **R_p**	INCREMENT GRADIENT **i**	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
7/11/14	13	56	29	56.48	0.000	11.3	17.6	22.9	NA
7/11/14	13	57	44	57.73	1.250	11.2	17.4	22.9	5.4E-08
7/11/14	14	4	4	4.07	7.583	10.7	16.5	22.9	5.5E-08
7/11/14	14	5	24	5.40	8.917	10.6	16.4	22.9	5.4E-08
7/11/14	14	6	44	6.73	10.250	10.5	16.2	22.9	5.4E-08
7/11/14	14	8	4	8.07	11.583	10.4	16.0	22.9	5.5E-08

Tested By: SFS Date: 7/10/14 Checked By: GEM Date: 7/14/14

DCN: CT-22A DATE:2-2-10 REVISION:2 T:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-04-01 Permometer.xls]Sheet1

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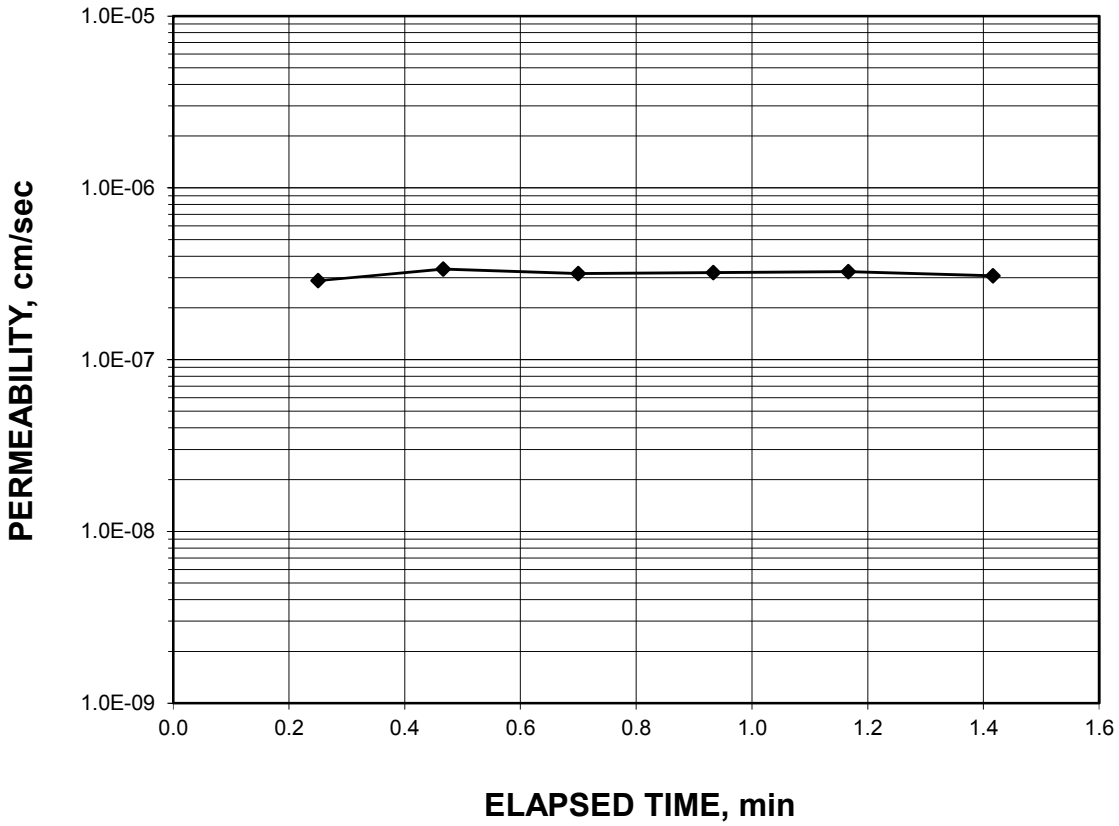
Area 14

Client	HDR ENGINEERING, INC.	Boring No.	14
Client Project	GREENBORO PH II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-05	Sample No.	1A
Lab ID No.	2014-660-05-02		

Visual Description: TAN CLAYEY SAND

AVERAGE PERMEABILITY = 3.2E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.2E-09 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: SFS Date: 8/20/2014 Checked By: GEM Date: 8/25/2014

DCN: CT-22A DATE:2-2-10 REVISION:25 N:\2014 PROJECTS\2014-660 HDR, GREENSBORO LF\[2014-660-05-02 Permometer.xls]Sheet1

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FLEXIBLE WALL PERMEABILITY TEST

PERMOMETER METHOD

ASTM D 5084-10

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Client	HDR ENGINEERING, INC.	Boring No.	14
Client Project	GREENBORO PH II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-05	Sample No.	1A
Lab ID No.	2014-660-05-02		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: TAN CLAYEY SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	801	808
Wt. of Tare & WS (gm.)	497.86	295.95
Wt. of Tare & DS (gm.)	471.03	274.49
Wt. of Tare (gm.)	99.70	103.77
Wt. of Water (gm.)	26.83	21.46
Wt. of DS (gm.)	371.33	170.72
Moisture Content (%)	**7.2**	**12.6**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	473.68	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	473.68	497.29
Length 1 (in.)	2.331	2.316
Length 2 (in.)	2.307	2.271
Length 3 (in.)	2.289	2.261
Top Diameter (in.)	2.812	2.791
Middle Diameter (in.)	2.815	2.806
Bottom Diameter (in.)	2.811	2.801
Average Length (in.)	2.31	2.28
Average Area (in.^{2})	6.21	6.15
Sample Volume (cm^3)	235.10	230.22
Unit Wet Wt. (gm./ cm^3)	2.015	2.160
Unit Wet Wt. (pcf)	125.8	134.8
Unit Dry Wt. (pcf)	117.3	119.8
Unit Dry Wt. (gm./ cm^3)	1.879	1.919
Void Ratio, e	0.437	0.407
Porosity, n	0.304	0.289
Pore Volume (cm^3)	71.5	66.6
Total Wt. Of Sample After Test		495..09

Tested By: SFS Date: 8/20/2014 Checked By: GEM Date: 8/25/2014

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PERMOMETER METHOD

ASTM D 5084-10

Client	HDR ENGINEERING, INC.	Boring No.	14
Client Project	GREENBORO PH II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-05	Sample No.	1A
Lab ID No.	2014-660-05-02		

Test Pressures		**Final Sample Dimensions**	
Cell Pressure(psi)	50.0	Sample Length (cm), L	5.80
Back Pressure(psi)	40.0	Sample Area (cm^2), A	39.71
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	96	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1

AVERAGE PERMEABILITY = 3.2E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.2E-09 m/sec @ 20°C

DATE			TIME		ELAPSED TIME **t**	PIPETTE READI NG **R_p**	INCREMENT GRADIENT **i**	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
8/22/2014	11	22	3	22.05	0.000	8.7	17.3	22.6	NA
8/22/2014	11	22	18	22.30	0.250	8.6	17.1	22.6	2.9E-07
8/22/2014	11	22	31	22.52	0.467	8.5	16.9	22.6	3.4E-07
8/22/2014	11	22	45	22.75	0.700	8.4	16.7	22.6	3.2E-07
8/22/2014	11	22	59	22.98	0.933	8.3	16.4	22.6	3.2E-07
8/22/2014	11	23	13	23.22	1.167	8.2	16.2	22.6	3.3E-07
8/22/2014	11	23	28	23.47	1.417	8.1	16.0	22.6	3.1E-07

Tested By: SFS Date: 8/20/2014 Checked By: GEM Date: 8/25/2014

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Area 17

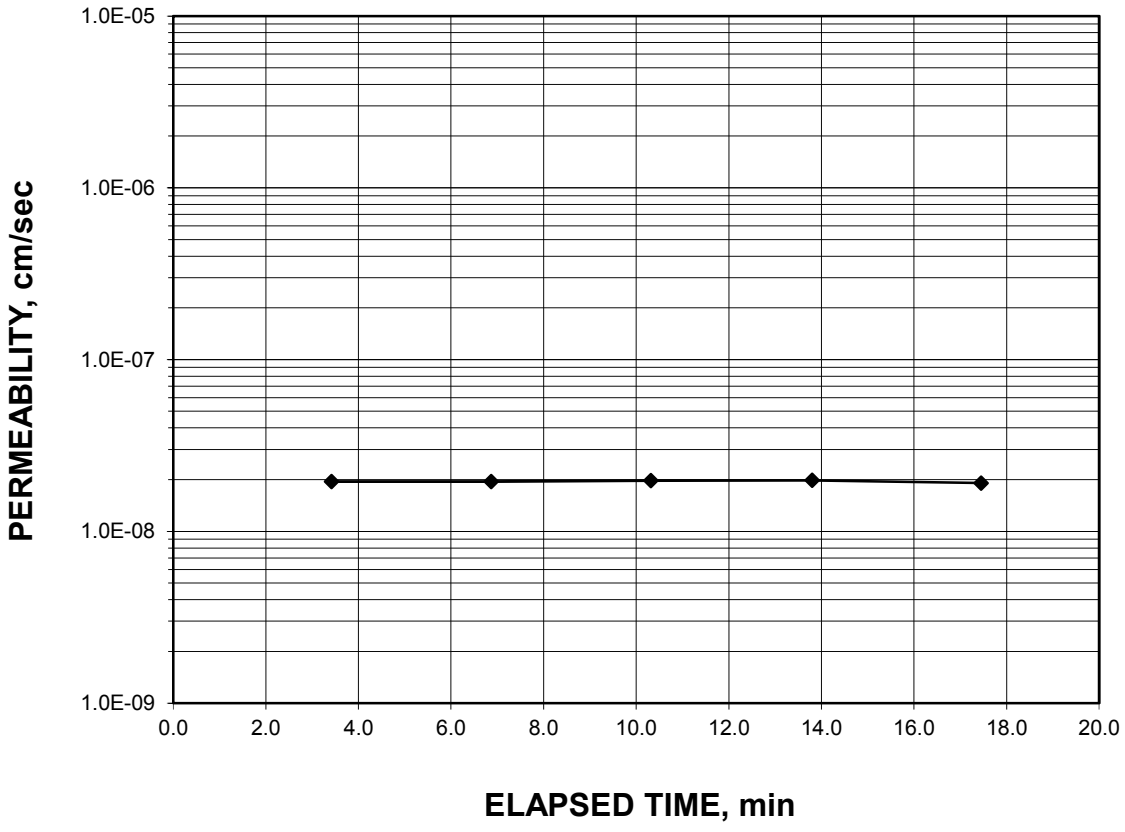
Client	HDR ENGINEERING, INC.	Boring No.	17
Client Project	GREENBORO PH II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-05	Sample No.	1A
Lab ID No.	2014-660-05-01		

Visual Description: TAN SANDY CLAY

AVERAGE PERMEABILITY = 2.0E-08 cm/sec @ 20°C

AVERAGE PERMEABILITY = 2.0E-10 m/sec @ 20°C

PERMEABILITY vs. TIME



Tested By: SFS Date: 8/20/2014 Checked By: GEM Date: 8/25/2014

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PERMOMETER METHOD

ASTM D 5084-10

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Client	HDR ENGINEERING, INC.	Boring No.	17
Client Project	GREENBORO PH II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-05	Sample No.	1A
Lab ID No.	2014-660-05-01		

Specific Gravity	2.70	Assumed
Sample Condition		Undisturbed

Visual Description: TAN SANDY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	808	801
Wt. of Tare & WS (gm.)	479.98	371.57
Wt. of Tare & DS (gm.)	427.30	324.06
Wt. of Tare (gm.)	103.94	99.52
Wt. of Water (gm.)	52.68	47.51
Wt. of DS (gm.)	323.36	224.54
Moisture Content (%)	**16.3**	**21.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	525.57	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	525.57	547.57
Length 1 (in.)	2.444	2.424
Length 2 (in.)	2.466	2.434
Length 3 (in.)	2.470	2.460
Top Diameter (in.)	2.857	2.865
Middle Diameter (in.)	2.853	2.866
Bottom Diameter (in.)	2.846	2.860
Average Length (in.)	2.46	2.44
Average Area (in.^{2})	6.39	6.44
Sample Volume (cm^3)	257.53	257.46
Unit Wet Wt. (gm./ cm^3)	2.041	2.127
Unit Wet Wt. (pcf)	127.4	132.8
Unit Dry Wt. (pcf)	109.5	109.6
Unit Dry Wt. (gm./ cm^3)	1.755	1.755
Void Ratio, e	0.539	0.538
Porosity, n	0.350	0.350
Pore Volume (cm^3)	90.1	90.1
Total Wt. Of Sample After Test		535.00

Tested By: SFS Date: 8/20/2014 Checked By: GEM Date: 8/25/2014

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Client	HDR ENGINEERING, INC.	Boring No.	17
Client Project	GREENBORO PH II, PART 2 CLOSURE	Depth (ft.)	N/A
Project No.	2014-660-05	Sample No.	1A
Lab ID No.	2014-660-05-01		

Test Pressures		**Final Sample Dimensions**	
Cell Pressure(psi)	50.0	Sample Length (cm), L	6.20
Back Pressure(psi)	40.0	Sample Area (cm^2), A	41.55
Eff. Cons. Pressure(psi)	10.0	Pipette Area (cm^2), a_p	0.03142
Response (%)	95	Annulus Area (cm^2), a_a	0.76712
		Equilibrium Level (cm), R_{eq}	1

AVERAGE PERMEABILITY = 2.0E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.0E-10 m/sec @ 20°C

DATE	TIME				ELAPSED TIME	PIPETTE READI NG	INCREMENT GRADIENT	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
					t	**R_p**	**i**		
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
8/22/2014	10	59	21	59.35	0.000	9.5	17.9	22.6	NA
8/22/2014	11	2	46	2.77	3.417	9.4	17.7	22.6	1.9E-08
8/22/2014	11	6	13	6.22	6.867	9.3	17.5	22.6	2.0E-08
8/22/2014	11	9	40	9.67	10.317	9.2	17.3	22.6	2.0E-08
8/22/2014	11	13	9	13.15	13.800	9.1	17.1	22.6	2.0E-08
8/22/2014	11	16	48	16.80	17.450	9.0	16.9	22.6	1.9E-08

Tested By: SFS Date: 8/20/2014 Checked By: GEM Date: 8/25/2014

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

C

Appendix C – Surveys

Plan Sheet No. S-1 – Initial, Clap Cap and Topsoil; Sections 1, 2, 3, 4, and 6

Plan Sheet No. S-2 – Initial, Clay Cap and Topspoil; Sections 5, 7, 9, and 8

Plan Sheet No. S-3 – Initial, Clay Cap and Topsoil; Sections 10, 12, 11, 13, and 14

Plan Sheet No. S-4 – Initial, Clay Cap and Topsoil; Sections 15, 17, and 16

Plan Sheet No. T-1 – Clay Topographic Survey; Sections 1 - 17

Plan Sheet No. T-2 – Topsoil Topographic Plan; Sections 1 - 17

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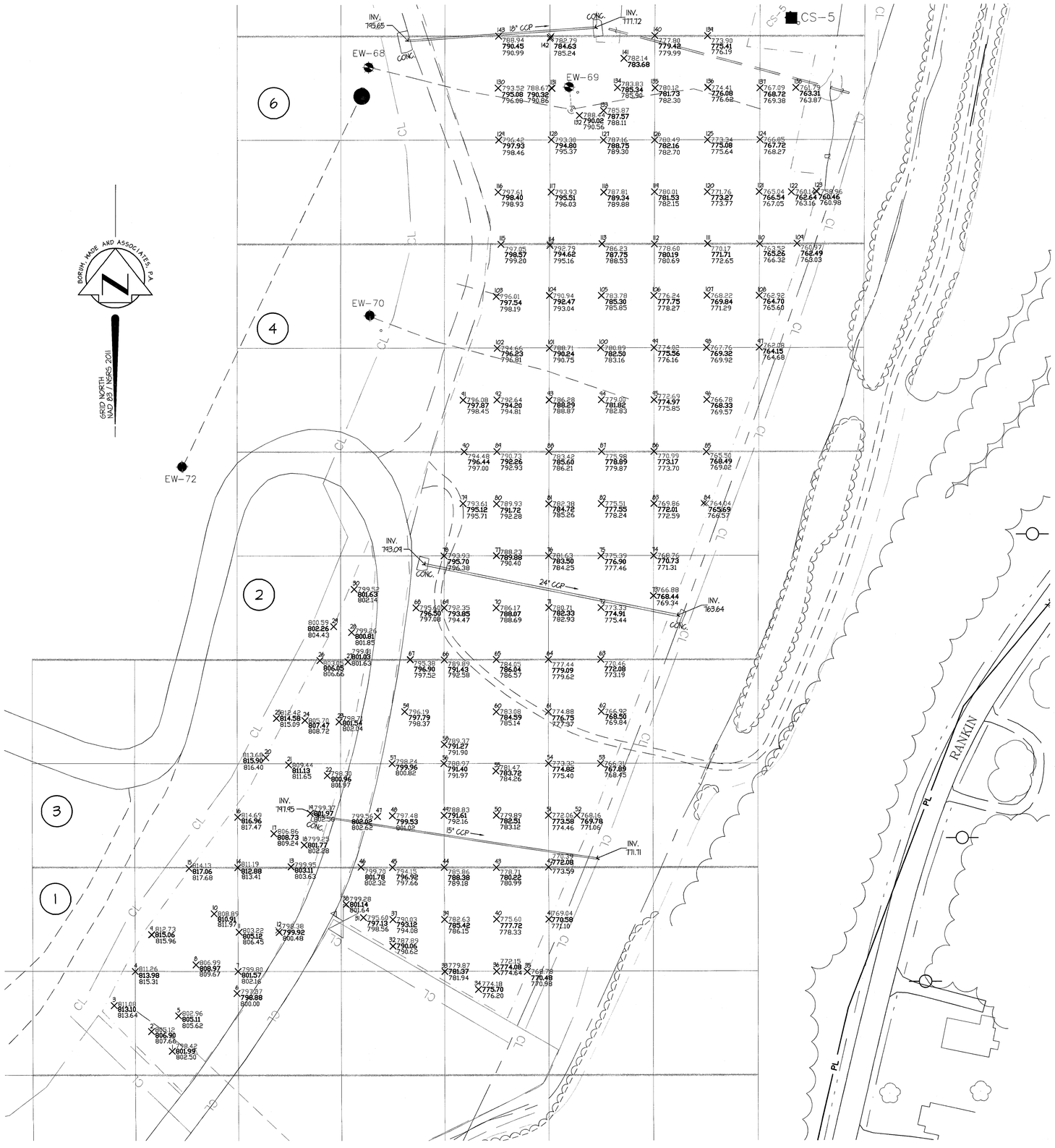


SECTIONS 1, 3, 2, 4, and 6

Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness
1	3.57'	.51'	32	2.17'	.56'	63	1.62'	1.11'	94	2.82'	1.01'
2	1.78'	.76'	33	1.50'	.57'	64	1.65'	.53'	95	2.28'	.88'
3	2.02'	.54'	34	1.52'	.50'	65	1.99'	.53'	96	1.55'	1.24'
4	2.72'	1.33'	35	1.70'	.50'	66	1.54'	1.15'	97	2.07'	.53'
5	2.15'	.51'	36	1.93'	.56'	67	1.52'	.62'	98	1.56'	.60'
6	1.51'	1.12'	37	3.09'	.96'	*68	0.90'	.58'	99	1.54'	.60'
7	1.77'	.59'	38	1.86'	.50'	69	1.50'	.62'	100	1.61'	.66'
8	1.98'	.70'	39	2.79'	.73'	70	1.90'	.62'	101	1.53'	.51'
9	2.33'	.90'	40	2.12'	.61'	71	1.62'	.60'	102	1.57'	.58'
10	2.02'	1.06'	41	1.54'	.52'	72	1.58'	.53'	103	1.53'	.65'
11	1.90'	1.33'	42	1.69'	1.51'	73	1.56'	.90'	104	1.53'	.57'
12	1.54'	.56'	43	1.51'	.77'	74	1.97'	.58'	105	1.52'	.55'
13	3.16'	.52'	44	2.52'	.80'	75	1.51'	.56'	106	1.51'	.52'
14	1.69'	.53'	45	2.77'	.74'	76	1.87'	.75'	107	1.62'	1.45'
15	2.93'	.62'	46	2.08'	.54'	77	1.65'	.52'	108	1.78'	.90'
16	2.27'	.51'	47	2.46'	.60'	78	1.77'	.68'	109	1.52'	.54'
17	1.87'	.51'	48	2.05'	1.49	79	1.51'	.59'	110	1.74'	1.06'
18	2.52'	.51'	49	2.78'	.55'	80	1.79'	.56'	111	1.54'	.94'
19	2.60'	.59'	50	2.62'	0.61	81	2.34'	.54'	112	1.59'	.50'
20	2.22'	.50'	51	1.52'	.88'	82	2.04'	.69'	113	1.52'	.78'
21	1.69'	.52'	52	1.62'	1.28'	83	2.15'	.58'	114	1.83'	.54'
22	2.66'	1.01'	53	1.58'	.56'	84	1.55'	.98'	115	1.52'	.63'
23	2.83'	.50'	54	1.50'	.58'	85	2.99'	.53'	*116	0.79'	.53'
24	1.77'	1.25'	55	2.25'	.54'	86	2.18'	.53'	117	1.98'	.52'
25	2.16'	.51'	56	2.43'	.57'	87	2.91'	.98'	118	1.53'	.54'
26	3.0'	.61'	57	1.72'	.86'	88	2.18'	.61'	119	1.52'	.62'
27	2.02'	.60'	58	1.90'	.63'	89	1.53'	.67'	120	1.51'	.50'
28	1.55'	1.04'	59	1.60'	.58'	90	1.96'	.56'	121	1.50'	.51'
29	1.67'	2.17'	60	1.51'	.55'	91	1.79'	.58'	122	2.50'	.52'
30	2.11'	.51'	61	1.87'	.62'	92	1.56'	.61'	123	1.50'	.52'
31	1.53'	1.43'	62	1.58'	.59'	93	2.01'	.58'	124	1.67'	.55'
125	1.74'	0.56'									
126	1.67'	0.54'									
127	1.59'	.55'									
128	1.50'	.57'									
129	1.51'	.53'									
130	1.56'	1.0'									
131	1.65'	.54'									
132	1.58'	.54'									
133	1.70'	.54'									
134	1.51'	.56'									
135	1.61'	.57'									
136	1.67'	.54'									
137	1.62'	.66'									
138	1.52'	.56'									
139	1.51'	.78'									
140	1.62'	.57'									
141	1.54'										
142	1.84'	.61'									
143	1.51'	.54'									

LEGEND

× 780.71 (INTIAL)
782.33 (CLAY CAP)
782.93 (TOPSOIL)

SURVEYOR'S CERTIFICATION

I hereby certify that the survey prepared by me entitled WHITE STREET LANDFILL - PHASE 2 CLOSE OUT SURVEY was actually made upon the ground and that it and the information and elevations are correctly shown.

(MAP AND CHARTS BY BORUM, WADE AND ASSOCIATES.)

Executed this 10th day of NOVEMBER 2014

Registration No. L-3731
HOMER S. WADE
621 EUGENE COURT
Greensboro, N.C.
27401

Signature
11/10/14
Date

NORTH CAROLINA PROFESSIONAL SEAL L-3731 LAND SURVEYOR HOMER S. WADE

GRAPHIC SCALE

0 25' 50' 100' 150' 200'

1" = 50'

BWA Engineers Planners Surveyors
Borum, Wade and Associates, P.A.
621 Eugene Court, Suite 100, Greensboro, NC 27401-2711
PO Box 21882 Greensboro, NC 27420-1882
Phone: 336-275-0471 Fax: 336-275-3719
Web: www.borum-wade.com
N.C. License #: C-0868

SEALS:

PROJECT:

WHITE STREET LANDFILL - PHASE 2
" CLOSE OUT SURVEY "
SECTIONS 1, 3, 2, 4 and 6
MOREHEAD TOWNSHIP, GUILFORD COUNTY
GREENSBORO, NORTH CAROLINA

OWNER/DEVELOPER:

CITY OF GREENSBORO
300 W. WASHINGTON STREET
GREENSBORO, NORTH CAROLINA 27401
(336) 373-2484
CONTACT: TRAVIS SHARPE

DRAWN BY:	MRO
DATE:	NOV. 10, 2014
REVISIONS:	

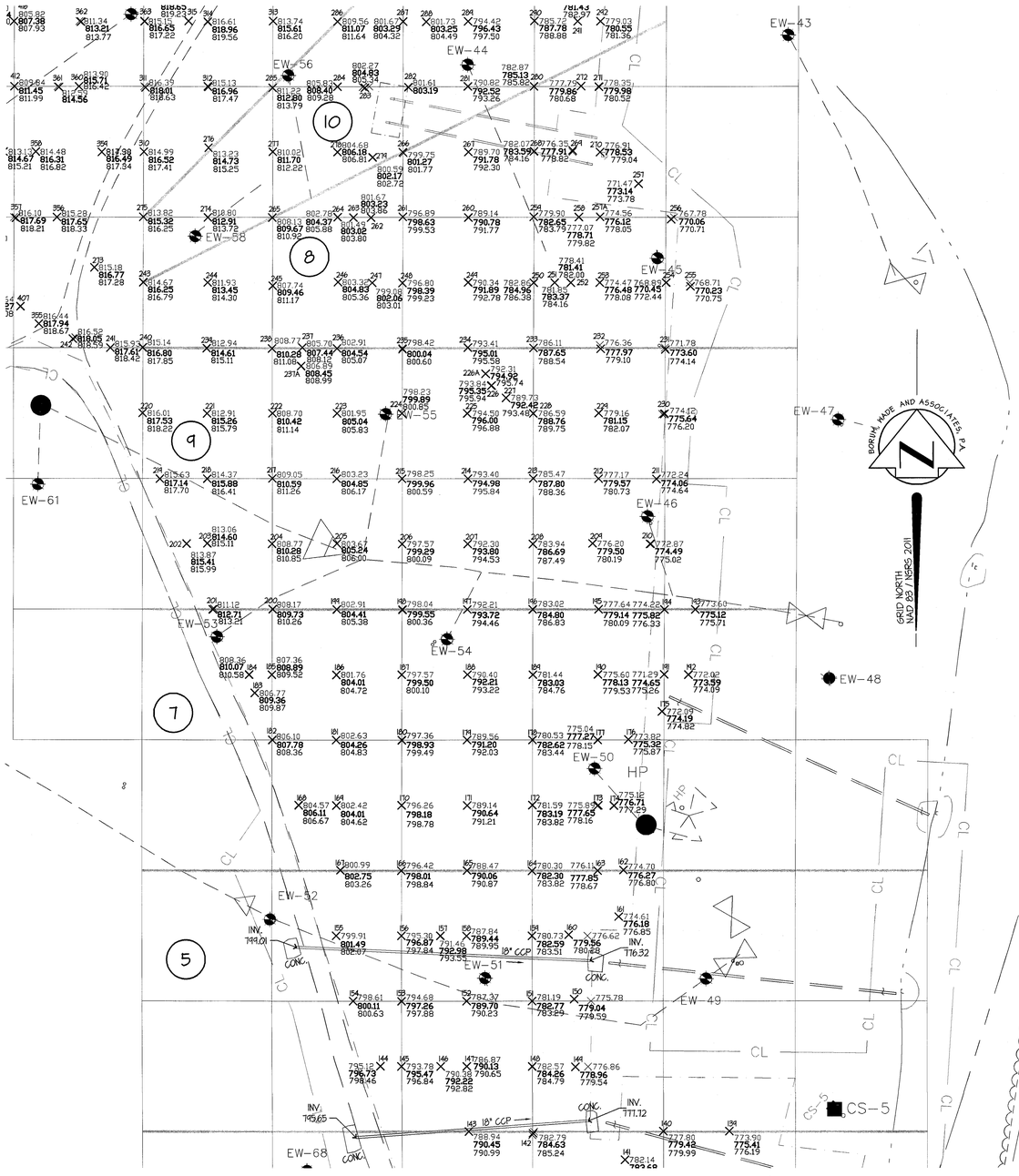
SHEET TITLE:
INITIAL, CLAY CAP and TOPSOIL
ELEVATIONS

FILE NO: F:\const\tr\whitest\whitest2\white2-stk

DRAWING SCALE: 1" = 50'

PLAN SHEET NO.

S-1



SECTIONS 5, 7, 9, and 8

Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness
144	1.61'	1.73'	175	2.10'	.63'	206	1.72'	.80'	236	1.63'	.53'
145	1.69'	1.37'	176	1.50'	.55'	207	1.50'	.73'	237	1.74'	.68'
146	1.84'	.60'	177	2.23'	.88'	208	2.75'	.80'	237A	1.56'	.54'
147	3.26'	.52'	178	2.09'	.82'	209	3.30'	.69'	238	1.51'	.80'
148	1.69'	.53'	179	1.64'	.83'	210	1.62'	.53'	239	1.67'	.50'
149	2.10'	.58'	180	1.57'	.56'	211	1.82'	.58'	240	1.66'	1.05'
150	3.26'	.55'	181	1.63'	.57'	212	2.40'	1.16'	241	1.68'	.81'
151	1.58'	.52'	182	1.68'	.58'	213	2.33'	.56'	242	1.53'	.54'
152	2.33	.53'	183	2.59'	.51'	214	1.58'	.86'	243	1.58'	.54'
153	2.58'	.62'	184	1.71'	.51'	215	1.71'	.63'	244	1.52'	.85'
154	1.50'	.52'	185	1.53'	.63'	216	1.62'	1.32'	245	1.72'	1.71'
155	1.58'	.58'	186	2.25'	.71'	217	1.54'	.67'	246	1.51'	.53'
156	1.57'	.97'	187	1.93'	.60'	218	1.51'	.53'	247	2.98'	.95'
157	1.52'	.57'	188	1.81'	1.01'	219	1.51'	.56'	248	1.59'	.84'
158	1.60'	.51'	189	1.59'	1.73'	220	1.52'	.69'	249	1.55'	.89'
159	1.86'	.92'	190	2.53'	1.40'	221	2.35'	.53'	250	2.10'	1.42'
160	2.94'	.72'	191	3.36'	.61'	222	1.72'	.72'	251	1.52'	.79'
161	1.57'	.58'	192	1.57'	.50'	223	3.09'	.79'	252	3.00'	.59'
162	1.57'	.53'	193	1.52'	.59'	224	1.66'	.96'	253	2.01'	1.60'
163	1.74'	.82'	194	1.60'	.51'	225	1.50'	.88'	254	1.56'	1.99'
164	2.00'	1.52'	195	1.50'	.95'	226	1.51'	.59'	255	1.52'	.52'
165	1.59'	.81'	196	1.78'	2.03'	226A	2.61'	.82'	256	2.28'	.65'
166	1.75'	.83'	197	1.51'	.74'	227	2.69'	1.06'	257	1.67'	.64'
167	1.76'	.51'	198	1.51'	.81'	228	2.17'	0.99	257A	1.56'	1.93'
168	1.54'	.56'	199	1.50'	.97'	229	1.99'	.92'	258	1.64'	1.01'
169	159'	.61'	200	1.56'	.53'	230	1.52'	.56'	259	3.75'	1.14'
170	1.92'	.60'	201	1.59'	.50'	231	1.82'	.54'	260	1.64'	.99'
171	1.50'	.57'	202	1.54'	.58'	232	1.61'	1.13'	261	1.74'	.90'
172	1.60'	.63'	203	1.54'	.51'	233	1.54'	.89'	262	1.56'	.63'
173	1.76	.51'	204	2.11'	.57'	234	1.60'	.57'	263	1.53'	.78'
174	1.59'	.58'	205	1.57'	.76'	235	1.62'	.56'	264	1.59'	1.51'
265	1.54'	1.25'									
266	1.52'	.50'									
267	2.08'	.52'									
268	1.52'	.57'									
269	1.56'	.91'									
270	1.62'	.51'									
271	1.63'	.54'									
272	2.07'	.82'									

LEGEND

× 780.71 (INTIAL)
782.33 (CLAY CAP)
782.93 (TOPSOIL)

SURVEYOR'S CERTIFICATION

I hereby certify that the survey prepared by me entitled WHITE STREET LANDFILL - PHASE 2 CLOSE OUT SURVEY was actually made upon the ground and that it and the information and elevations are correctly shown.

(MAP AND CHARTS BY BORUM, WADE AND ASSOCIATES.)

Executed this 10th day of NOVEMBER 2014

Registration No. L-3731
HOMER S. WADE
621 EUGENE COURT
Greensboro, N.C.
27401

Signature
11/10/14
Date

NORTH CAROLINA PROFESSIONAL SEAL L-3731 LAND SURVEYOR HOMER S. WADE

GRAPHIC SCALE
0 25' 50' 100' 150' 200'
1" = 50'

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WHITE STREET LANDFILL - PHASE 2
" CLOSE OUT SURVEY "
SECTIONS 5, 7, 9, and 8
MOREHEAD TOWNSHIP, GUILFORD COUNTY
GREENSBORO, NORTH CAROLINA

OWNER/DEVELOPER:

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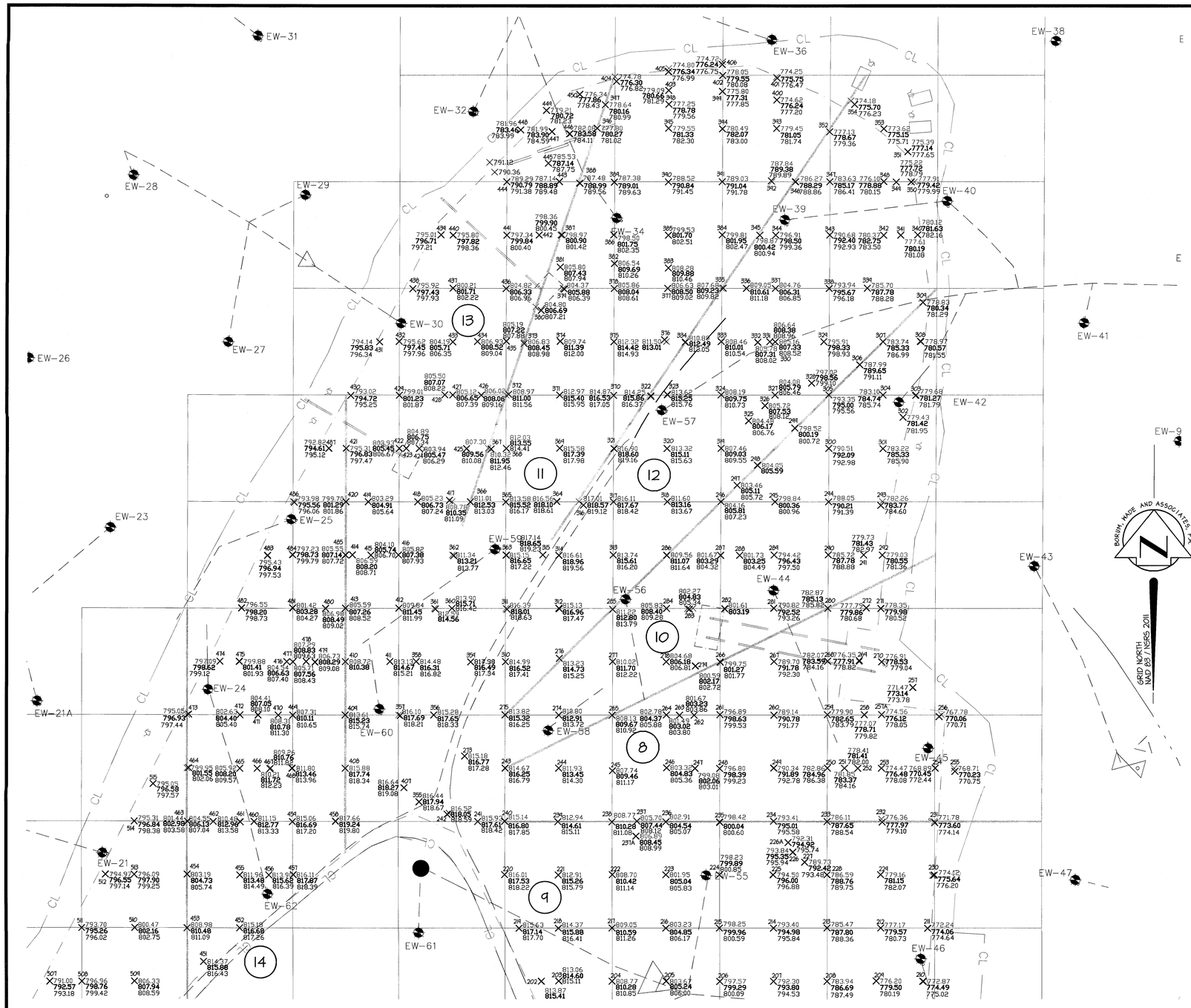
300 W. WASHINGTON STREET
GREENSBORO, NORTH CAROLINA 27401
(336) 373-2484
CONTACT: TRAVIS SHAPRE

DRAWN BY:	MRO
DATE:	NOV. 10, 2014
REVISIONS:	

SHEET TITLE:
INITIAL, CLAY CAP AND TOPSOIL
ELEVATIONS

FILE NO: F:\constlk\cr\whitest\whitest2\white2-stk
DRAWING SCALE: 1" = 50'
PLAN SHEET NO.
S - 2



SECTIONS 10, 12, 11, 13, and 14

Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness
273	1.59'	.51'	304	1.64'	1.00'	335	1.55'	.59'	366	1.52'	.50'
274	2.11'	.81'	305	1.65'	.56'	336	1.56'	.57'	367	1.63'	.51'
275	1.50'	.93'	306	1.66'	1.46'	337	1.55'	.54'	368	1.52'	.86'
276	1.50'	.52'	307	1.59'	1.66'	338	1.73'	.51'	369	1.81'	.59'
277	1.68'	.52'	308	1.60'	.98'	339	2.08'	.50'	370	1.66'	.52'
278	1.50'	.63'	309	1.51'	.92'	340	1.51'	.53'	371	2.43'	.55'
279	1.58'	.55'	310	1.53'	.89'	341	2.58'	.89'	372	2.03'	.56'
280	2.26'	.69'	311	1.62'	.62'	342	2.38'	.75'	373	1.62'	.53'
281	1.70'	.74'	312	1.83'	.51'	343	1.72'	.53'	374	1.65'	.61'
282	1.58'		313	1.87'	.59'	344	1.59'	.86'	375	2.10'	.51'
283	2.56'	.51'	314	2.35'	.60'	345	1.55'	.52'	376	1.51'	
284	2.57'	.88'	315	1.51'	.58'	346	2.02'	.57'	377	1.87'	.52'
285	1.58'	.99'	316	1.56'	.55'	347	1.54'	1.24'	378	2.18'	.57'
286	1.51'	.57'	317	1.56'	.75'	348	2.78'	1.27'	379	1.51'	.51'
287	1.62'	1.03'	318	1.56'	.51'	349	2.50'	1.07'	380	1.89'	.52'
288	1.52'	1.20'	319	1.57'	.52'	350	1.51'	.57'	381	1.63'	.51'
289	2.01'	1.07'	320	1.79'	.52'	351	1.75'	.51'	382	3.15'	.57'
290	2.06'	1.10'	321	1.70'	.56'	352	1.54'	.69'	383	1.60'	.58'
291	1.70'	1.54'	322	1.61'	.51'	353	1.53'	.56'	384	2.14'	.52'
292	1.52'	.81'	323	1.63'	.51'	354	1.52'	.53'	385	2.17'	.81'
293	1.51'	.83'	324	1.56'	.98'	355	1.50'	.73'	386	3.25'	.60'
294	2.16'	1.18'	325	1.69'	.59'	356	2.37'	.68'	387	1.93'	.52'
295	1.52'	.60'	326	1.81'	.59'	357	1.59'	.52'	388	1.51'	.57'
296	1.65'	1.42'	327	1.71'	.67'	358	1.83'	.51'	389	1.63'	.62'
297	1.65'	.61'	328	1.54'	.54'	359	1.51'	.85'	390	2.32'	.61'
298	1.54'		329	2.42'	.60'	360	1.81'	.71'	391	2.01'	.74'
299	1.67'	.53'	330	2.17'	1.19'	361	1.97'		392	1.54'	.51'
300	1.58'	.89'	331	1.74'	.58'	362	1.87'	.56'	393	1.60'	.69'
301	2.11'	.57'	332	1.53'	.71'	363	1.50'	.57'	394	1.58'	.93'
302	1.99'	.53'	333	1.55'	.53'	364	1.54'	.57'	395	1.78'	.97'
303	1.59'	.52'	334	1.60'	.56'	365	1.94'	.65'	396	2.47'	.75'
397	1.52'	.83'	424	1.53'	.82'	451	1.51'	.55'	478	1.54'	.80'
398	1.53'	.78'	425	2.26'	.52'	452	1.50'	.58'	479	1.56'	.79'
399	1.51'	.54'	426	2.04'	1.10'	453	1.50'	.61'	480	1.51'	.53'
400	1.62'	.96'	427	1.53'	.74'	454	1.54'	1.01'	481	1.86'	.99'
401	1.50'	.72'	428	1.57'	1.15'	455	1.52'	1.01'	482	1.65'	.53'
402	1.50'	.53'	429	2.22'	.64'	456	1.72'	.77'	483	1.51'	.59'
403	1.57'	.63'	430	1.70'	.53'	457	1.76'	.52'	484	1.50'	1.06'
404	1.56'	.52'	431	1.69'	.51'	458	1.58'	.56'	485	1.59'	.58'
405	1.54'	.65'	432	1.83'	.51'	459	1.63'	.51'	486	1.58'	.50'
406	1.52'	.51'	433	1.52'	.64'	460	1.62'	.56'	487	1.79'	.51'
407	1.63'	.81'	434	1.59'	.52'	461	2.48'	.62'			
408	1.86'	.60'	435	2.03'	.66'	462	1.58'	.91'			
409	1.62'	.51'	436	1.51'	.63'	463	1.54'	.60'			
410	1.66'		437	1.50'	.51'	464	1.60'	.51'			
411	1.54'	.54'	438	1.51'	.50'	465	2.28'	1.37'			
412	1.61'	.54'	439	1.70'	.50'	466	1.51'	.51'			
413	1.67'	1.26'	440	2.02'	.54'	467	1.51'	.51'			
414	1.61'	.51'	441	2.50'	.56'	468	1.66'	.50'			
415	1.64'	.96'	442	1.54'	.55'	469	2.80'	.54'			
416	1.56'	.55'	443	1.75'	.59'	470	2.47'	.52'			
417	1.57'	.74'	444	1.50'	.59'	471	2.64'	1.05'			
418	1.50'	.51'	445	1.61'	.61'	472	1.77'	1.00'			
419	1.62'	.73'	446	1.50'	.53'	473	1.88'	.51'			
420	1.59'	.57'	447	1.91'	.69'	474	1.53'	.50'			
421	1.52'	.64'	448	1.50'	.53'	475	1.53'	.52'			
422	1.52'	1.22'	449	1.51'	.51'	476	2.09'	.77'			
423	1.86'	.59'	450	1.52'	.57'	477	1.85'	.587'			

LEGEND

× 780.71 (INTIAL)
782.33 (CLAY CAP)
782.93 (TOPSOIL)

SURVEYOR'S CERTIFICATION

I hereby certify that the survey prepared by me entitled WHITE STREET LANDFILL - PHASE 2 CLOSE OUT SURVEY was actually made upon the ground and that it and the information and elevations are correctly shown.

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11/10/14
Date

NORTH CAROLINA PROFESSIONAL SEAL L-3731 LAND SURVEYOR HOMER S. WADE

GRAPHIC SCALE

0 25' 50' 100' 150' 200'

1" = 50'

BWA Engineers Planners Surveyors
Borum, Wade and Associates, P.A.
621 Eugene Court, Suite 100, Greensboro, NC 27401-2711
PO Box 21882 Greensboro, NC 27420-1882
Phone: 336-275-0471 Fax: 336-275-3719
Web: www.borum-wade.com
N.C. License #: C-0868

SEALS:

PROJECT:

WHITE STREET LANDFILL - PHASE 2
" CLOSE OUT SURVEY"
SECTIONS 10, 12, 11, 13 and 14
MOREHEAD TOWNSHIP, GUILFORD COUNTY
GREENSBORO, NORTH CAROLINA

OWNER/DEVELOPER:

CITY OF GREENSBORO
300 W. WASHINGTON STREET
GREENSBORO, NORTH CAROLINA 27401
(336) 373-2484
CONTACT: TRAVIS SHAPRE

DRAWN BY:	MRO
DATE:	NOV. 10, 2014
REVISIONS:	

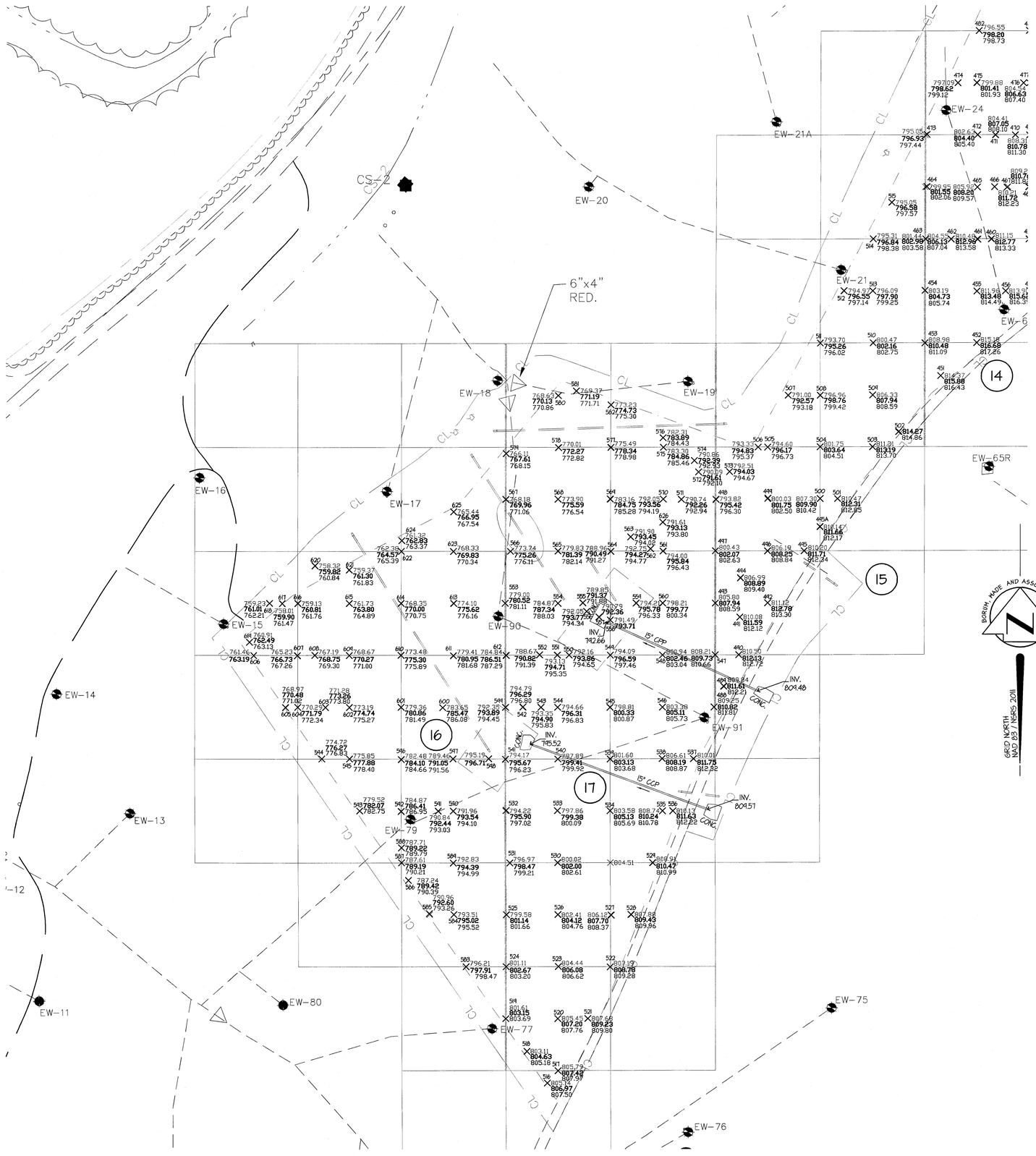
SHEET TITLE:
INITIAL, CLAY CAP AND TOPSOIL
ELEVATIONS

FILE NO: F:\constlk\hr\whitest\whitest2\white2-stk

DRAWING SCALE: 1" = 50'

PLAN SHEET NO.

S - 3



SECTIONS 15, 17 and 16

Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness	Point #	Clay Thickness	Topsoil Thickness
488	1.57'	0.99'	518	1.52'	.55'	549	2.50'	.87'	580	1.50'	.73'
489	1.77'	.60'	519	1.54'	.54'	550	1.70'	.79'	581	1.82'	.52'
490	1.63'	.59'	520	1.75'	.56'	551	1.58'	.64'	582	1.50'	.57'
491	1.51'	.53'	521	1.55'	.57'	552	2.15'	.57'	583	1.70'	.56'
492	1.66'	.52'	522	1.55'	.50'	553	1.52'	.59'	584	1.51'	.50'
493	2.14'	.65'	523	1.64'	.54'	554	2.47'	.69'	585	1.64'	.66'
494	2.00'	.51'	524	1.56'	.53'	555	1.52'	.51'	586	1.81'	.97'
495	1.51'	.63'	525	1.56'	.52'	556	1.72'	.57'	587	1.58'	1.02'
495A	1.52'	.51'	526	1.71'	.64'	557	1.57'		588	1.51'	.57'
496	2.06'	.59'	527	1.58'	.67'	558	2.22'		589	1.56'	.60'
497	1.64'	.56'	528	1.55'	.53'	559	1.57'	.55'	590	1.58'	.56'
498	1.60'	.88'	529	1.56'	.52'	560	1.56'	.57'	591	1.60'	.59'
499	1.72'	.75'	530	1.98'	.61'	561	1.84'	.59'	592	1.54'	.54'
500	2.60'	.52'	531	1.50'	.74'	562	1.52'	.50'	593	2.22'	.68'
501	184'	.54'	532	1.68'	1.12'	563	1.55'	.57'	594	1.55'	.56'
502		.59'	533	1.52'	.71'	564	1.53'	.78'	595	2.03'	.52'
503	1.98'	.51'	534	1.55'	.56'	565	1.56'	.75'	596	1.62'	.56'
504	1.89'	.87'	535	1.50'	.54'	566	1.52'	.85'	597	1.59'	.51'
505	1.57'	.56'	536	1.50'	.59'	567	1.78'	1.10'	598	1.57'	
506	1.52'	.54'	537	1.74'	.57'	568	1.69'	.95'	599	1.54'	.56'
507	1.57'	.61'	538	1.58'	.68'	569	1.59'	.53'	600	1.82'	.61'
508	1.80'	.66'	539	1.53'	.55'	570	1.51'	.63'	601	1.50'	.63'
509	1.61'	.65'	540	1.52'	.51'	571	1.52'	.68'	602	1.55'	.53'
510	1.69'	.59'	541	1.50'	.56'	572	1.52'	.49'	603	1.98'	.54'
511	1.56'	.76'	542	1.50'	.51'	573	1.52'	.64'	604	1.50'	.55'
512	1.58'	.59'	543	1.55'	.93'	574	1.53'	.54'	605	1.51'	.54'
513	1.81'	1.35'	544	1.65'	.52'	575	1.56'	.60'	606	1.73'	
514	1.53'	1.54'	545	1.52'	.54'	576	1.58'	.54'	607	1.50'	.53'
515	1.53'	.99'	546	1.73'	.62'	577	2.85'	.64'	608	1.56'	.55'
516	1.83'	.53'	547	1.52'	.93'	578	2.26'	.55'	609	1.60'	.73'
517	1.63'	.55'	548	1.52'	.58'	579	1.50'	.54'	610	1.82'	.59'
611	1.54'	.73'									
612	1.67'	.78'									
613	1.52'	.54'									
614	1.65'	.75'									
615	2.07'	1.09'									
616	1.68'	.95'									
617	1.89'	1.57'									
618	1.78'	1.20'									
619	1.58'	.64'									
620	1.50'	1.02'									
621	1.93'	.53'									
622	2.19'	.82'									
623	1.50'	.51'									
624	1.51'	.54'									
625	1.51'	.59'									
626	1.93'	.73'									

LEGEND

X 780.71 (INTIAL)
782.33 (CLAY CAP)
782.93 (TOPSOIL)

SURVEYOR'S CERTIFICATION

I hereby certify that the survey prepared by me entitled WHITE STREET LANDFILL - PHASE 2 CLOSE OUT SURVEY was actually made upon the ground and that it and the information and elevations are correctly shown.

(MAP AND CHARTS BY BORUM, WADE AND ASSOCIATES.)

Executed this 10th day of NOVEMBER 2014

Registration No. L-3731
HOMER S. WADE
621 EUGENE COURT
Greensboro, N.C.
27401

Signature

11/10/14
Date

NORTH CAROLINA PROFESSIONAL SEAL L-3731 LAND SURVEYOR HOMER S. WADE

GRAPHIC SCALE

0 25' 50' 100' 150' 200'

1" = 50'

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SEALS:

PROJECT:

WHITE STREET LANDFILL - PHASE 2
" CLOSE OUT SURVEY "
SECTIONS 15, 17 and 16
MOREHEAD TOWNSHIP, GUILFORD COUNTY
GREENSBORO, NORTH CAROLINA

OWNER/DEVELOPER:

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DRAWN BY:	MRO
DATE:	NOV. 10, 2014
REVISIONS:	

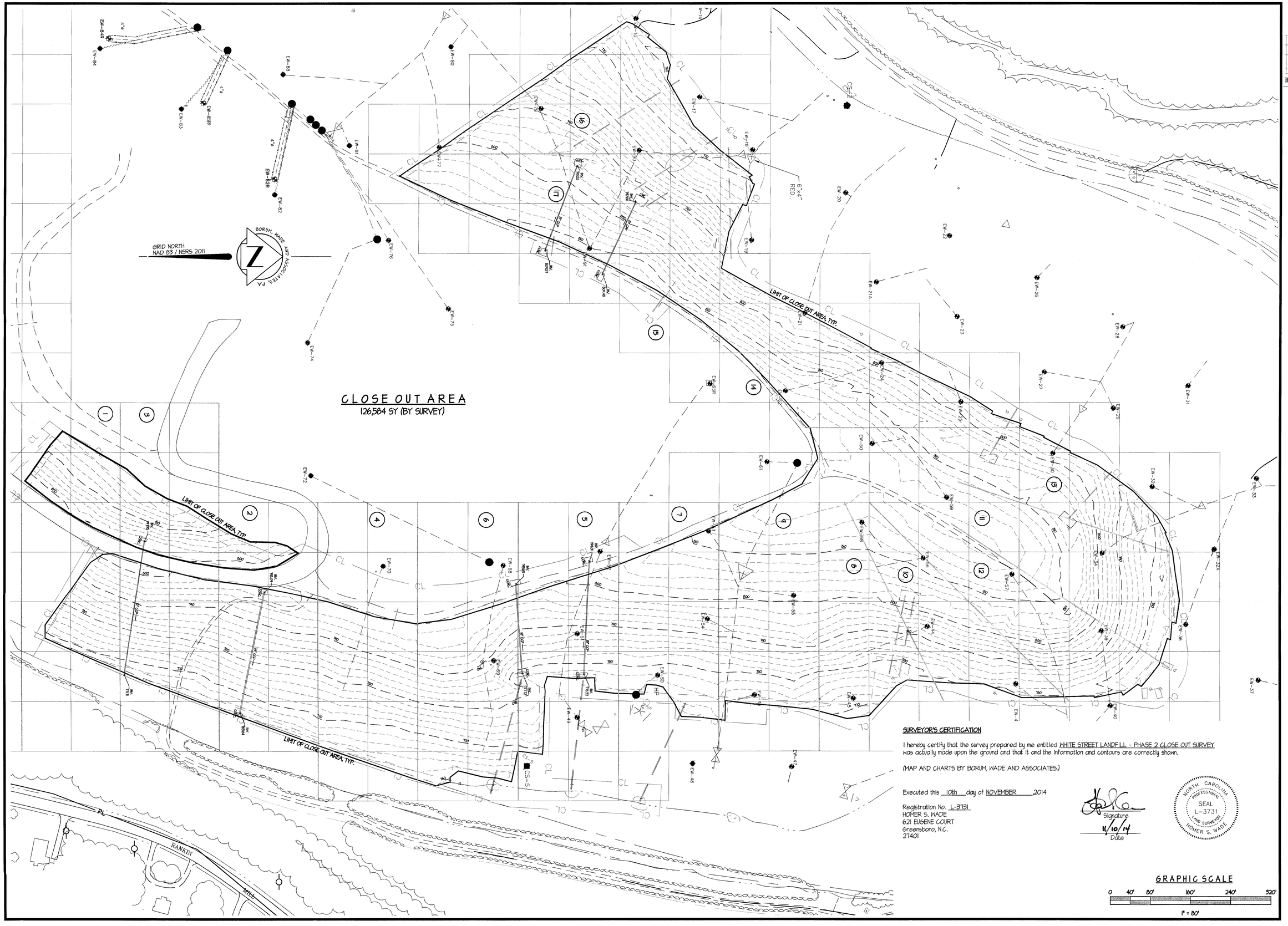
SHEET TITLE:
INITIAL, CLAY CAP AND TOPSOIL
ELEVATIONS

FILE NO: F:\consbk\lrh\whitest\whitest2\white2-stk

DRAWING SCALE: 1" = 50'

PLAN SHEET NO.

S - 4



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11/10/14
Date

NORTH CAROLINA PROFESSIONAL SEAL L-3731 LAND SURVEYOR HOMER S. WADE

GRAPHIC SCALE
0 40' 80' 160' 240' 320'
1" = 80'

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SEALS:

PROJECT:

WHITE STREET LANDFILL - PHASE 2
" CLOSE OUT SURVEY "
SECTIONS 1 - 17
MOREHEAD TOWNSHIP, GUILFORD COUNTY
GREENSBORO, NORTH CAROLINA

OWNER/DEVELOPER:

CITY OF GREENSBORO
300 W. WASHINGTON STREET
GREENSBORO, NORTH CAROLINA 27401
(336) 373-2489
CONTACT:

DRAWN BY:	MRO
DATE:	NOV. 10, 2014
REVISIONS:	

SHEET TITLE:

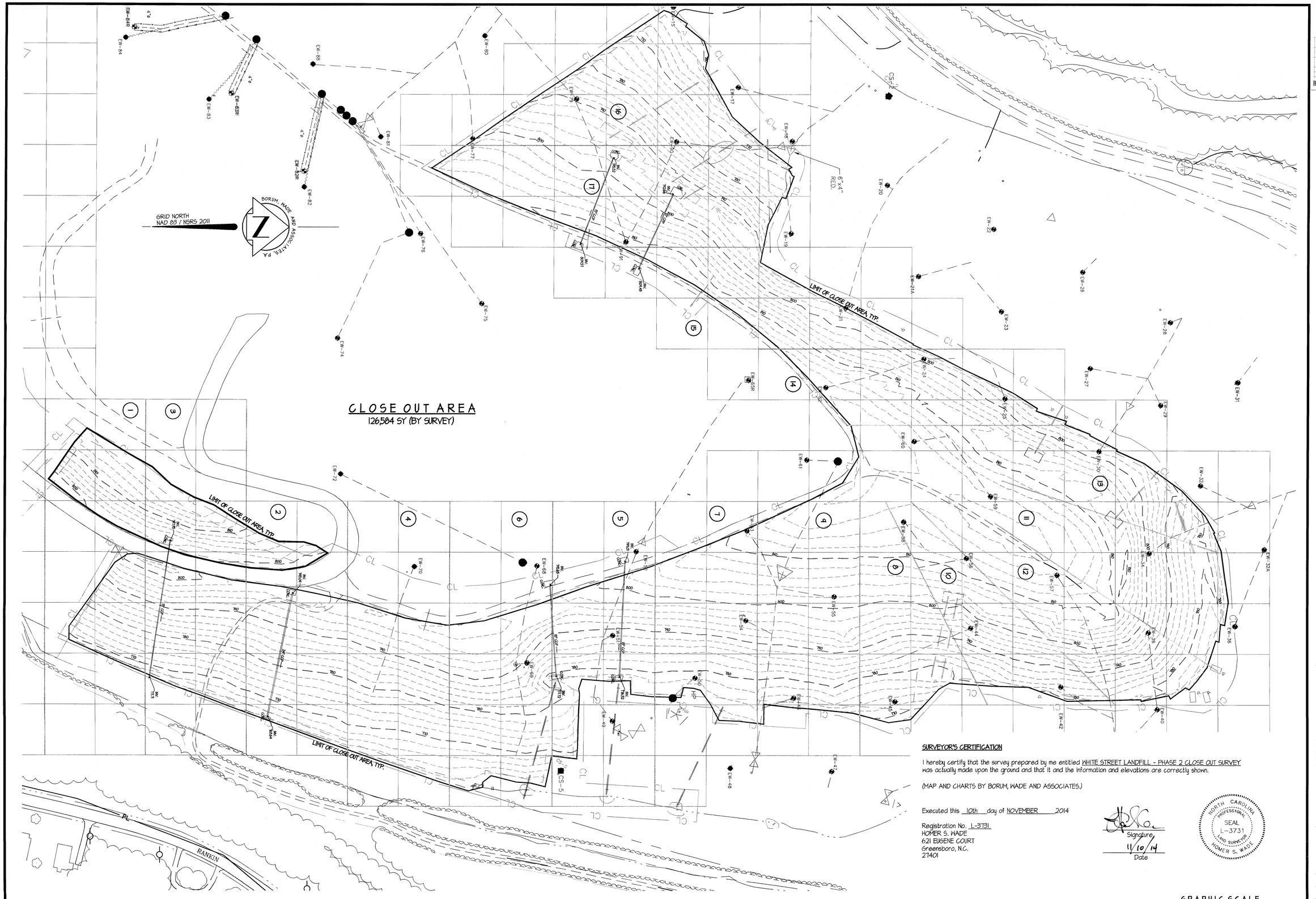
CLAY TOPOGRAPHIC SURVEY

FILE NO: F:\constk\tri\whitest\whitest2\white2-stk

DRAWING SCALE: 1" = 80'

PLAN SHEET NO.

T-1



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(MAP AND CHARTS BY BORUM, WADE AND ASSOCIATES.)

Executed this 10th day of NOVEMBER 2014

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621 EUGENE COURT
Greensboro, N.C.
27401

Signature
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NORTH CAROLINA PROFESSIONAL SEAL L-3731 LAND SURVEYOR HOMER S. WADE

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WHITE STREET LANDFILL - PHASE 2
" CLOSE OUT SURVEY "
SECTIONS 1 - 17
MOREHEAD TOWNSHIP, GUILFORD COUNTY
GREENSBORO, NORTH CAROLINA

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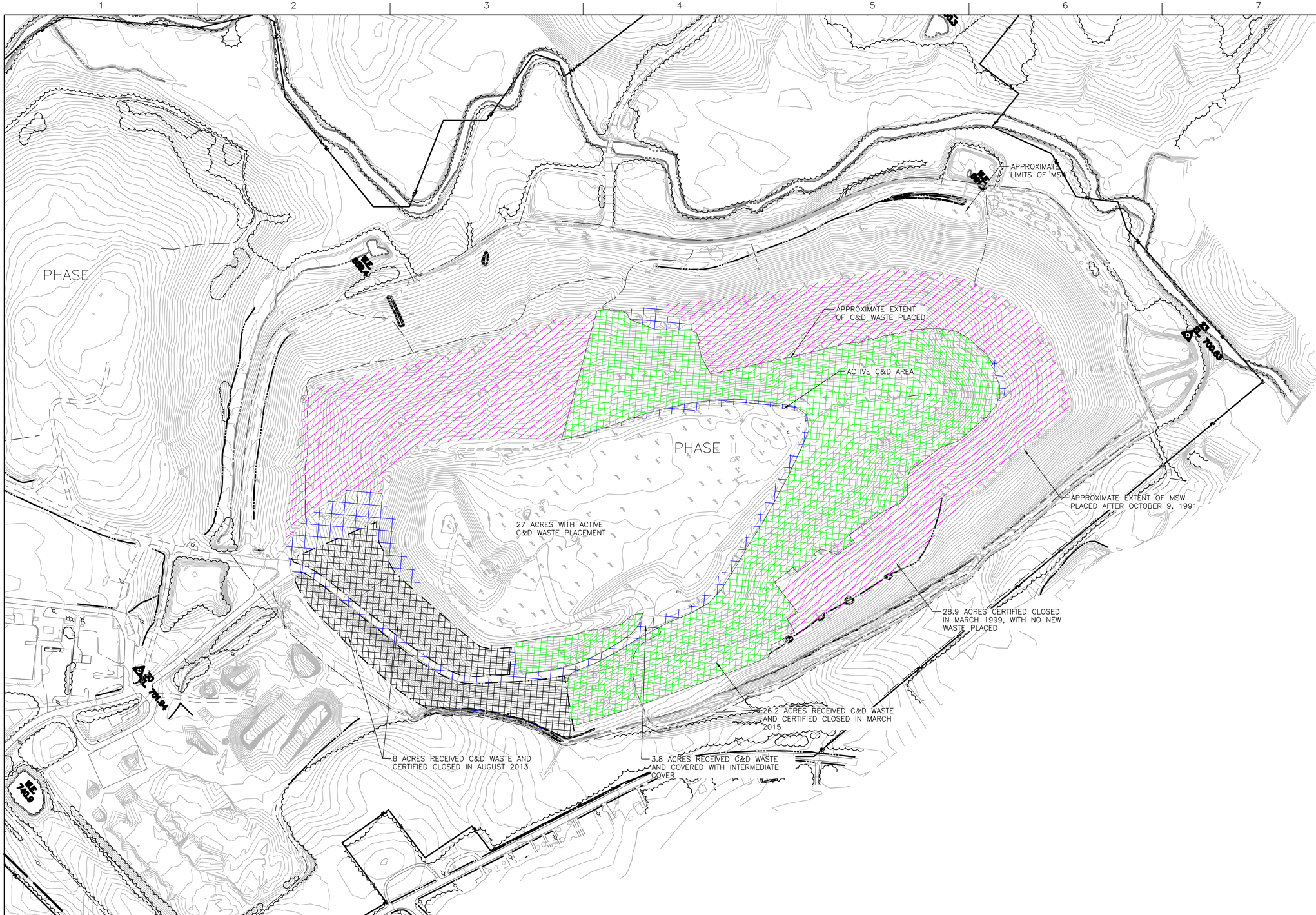
GREENSBORO, NORTH CAROLINA 27401
(336) 373-2484
CONTACT:

DRAWN BY:	MRO
DATE:	NOV. 10, 2014
REVISIONS:	

SHEET TITLE:
TOP SOIL TOPOGRAPHIC
SURVEY

FILE NO: F:\constk\ri\whitest\whitest2\white2-stk
DRAWING SCALE: 1" = 80'
PLAN SHEET NO.

T - 2



GENERAL NOTES:

1. TOPOGRAPHY OUTSIDE OF PHASE II AREA TAKEN FROM SURVEY PROVIDED BY CITY OF GREENSBORO DATED 2009.
2. TOPOGRAPHY WITHIN PHASE II AREA TAKEN FROM AERIAL SURVEY BY BRADY SURVEYING DATED JUNE 27, 2010.

GENERAL LEGEND:

- 790 — EXISTING CONTOURS
- 28.9 ACRES CERTIFIED CLOSED IN MARCH 1999, WITH NO NEW WASTE PLACED
- 3.8 ACRES RECEIVED C&D WASTE AND COVERED WITH INTERMEDIATE COVER
- 8 ACRES RECIEVED C&D WASTE AND CERTIFIED CLOSURE IN AUGUST 2013
- 26.2 ACRES RECIEVED C&D WASTE AND CERTIFIED CLOSURE IN MARCH 2015

HDR
HDR Engineering, Inc. of the Carolinas
N.C.B.E.L.S. License Number: F-0116
440 S Church Street, Suite 1000 | Charlotte, NC 28202

ISSUE	DATE	DESCRIPTION
C	08/15	REVISED TO SHOW MARCH 2015 C&D CLOSURE
B	12/13	REVISED TO SHOW PART I C&D CLOSURE
A	06/10	ISSUED FOR CLIENT REVIEW

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	C. METTLER, E.I.
DRAWN BY	
REVIEWED BY	
PROJECT NUMBER	6770-109019-018

WHITE STREET LANDFILL
PHASE II
PARTIAL CLOSURE

Greensboro North Carolina

LANDFILL CONDITIONS

0 1" 2"

FILENAME	01F-01.dwg
SCALE	1"=200'

SHEET 01F-01