CDM

Wake County, North Carolina

North Wake Subtitle D Landfill

Phase 2 Final Closure
Construction Quality Assurance

CQA Report
Appendix A
Appendix B
Appendix C
Appendix D
Appendix E

February 2010

WAKE COUNTY
NORTH CAROLINA

Report

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February 22, 2010

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North Carolina Department of Environment and Natural Resources
Division of Waste Management
Solid Waste Section Permitting Branch
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Subject: Construction Quality Assurance Report
North Wake Subtitle D Landfill – Phase 2 Closure
Wake County, North Carolina
Permit No. 92-09
CDM Project No. 6172-66948

Dear Ms. Wilson:

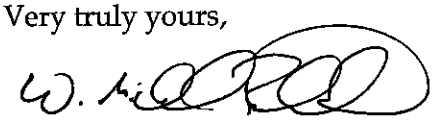
The purpose of this letter is to transmit two (2) copies of the Construction Quality Assurance (CQA) Report for the North Wake Landfill Phase 2 Closure project. Camp Dresser & McKee (CDM) performed CQA testing and oversight during construction of the intermediate cover and liner subgrade preparation, as well as installation of the 40-mill LLDPE liner and geocomposite drainage net, construction of the protective and vegetative cover layers, installation of the stormwater collection system, and related park project work in accordance with the Solid Waste Management Rules, conditions of the Permit to Construct, February 9, 2004 permit amendment and the construction documents prepared by CDM.

This letter is also intended to serve as the certification statement that is required by Rules .1624 and .1627. I have reviewed the test results and other documentation presented in this CQA report and confirm that they accurately reflect the installation and testing that was observed by CDM. To the best of my knowledge, information, and belief, construction of the North Wake Landfill Phase 2 Closure project was completed in general accordance with:

- the approved CQA Plan;
- the conditions of the Permit to Construct;
- the requirements of Rule .1627; and,
- acceptable engineering practices.

If you have any questions or comments, or need additional information for your review, please do not hesitate to contact me.

Very truly yours,



W. Michael Brinchek, P.E.
Project Engineer
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Attachments

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Section 1
Introduction

This report summarizes the construction oversight and quality assurance testing provided by Camp Dresser & McKee (CDM) during construction of the North Wake Subtitle D Landfill Phase 2 Closure project. Closure work began in June 2008 and was completed by July 2009 and included decommissioning of the leachate pond and extra work added to the closure project for construction of the park reuse area. The decommissioning of the leachate pond is presented in Section 10, whereas the extra work performed for the park reuse project is presented in Section 11 of this report. The completed project resulted in the final closure of approximately 39.7 acres of MSWLF waste fill area, in addition to the 33.2 acres that was partially closed in 2004, for a total closure area of 72.9 acres.

The purpose of this report is to provide the completed construction quality assurance documentation for the North Wake Landfill Phase 2 Closure project. This report contains daily field reports, field test results and conformance test results, as well as a discussion of the test results and procedures used during construction. The following critical elements of the North Wake Landfill Phase 2 Closure construction project have been addressed in this report.

- Earthwork
- Intermediate Cover and Liner Subgrade Preparation
- 40-Mil LLDPE Liner
- Geocomposite Drainage Net
- 18" Protective Cover
- 6" Vegetative Cover
- Stormwater Collection and Downdrain System
- Improvements to Landfill Gas Collection System
- Decommissioning of the Leachate Pond
- Additional Work for the Park Reuse Area

Documentation compiled throughout the North Wake Landfill Phase 2 Closure construction project, including Record Drawings prepared by Thalle Construction Co, Inc. (General Contractor for the project) and Hallaton, Inc. (Liner subcontractor to Thalle Construction) have been presented in the Appendices attached to this report.

The North Wake Landfill Phase 2 Closure project site is located at 9025 Deponie Drive off Durant Road, between Falls of Neuse Road and Capital Blvd. The Subtitle D Landfill was first permitted in 1996 (Permit No. 92-09) issued by the North Carolina Department of Environment and Natural Resources (NCDENR), Solid Waste Section. Access to the construction site is via the existing landfill entrance off Durant Road and the existing concrete road around the perimeter of the landfill closure area.

The components of the North Wake Landfill Phase 2 Closure construction project are addressed within the following sections of this report:

- Section 2 – Earthwork
- Section 3 – Intermediate Cover and Liner Subgrade Preparation
- Section 4 –LLDPE Geomembrane Lining
- Section 5 – Geocomposite Drainage Net
- Section 6 – Protective Soil Cover Layer
- Section 7 – Vegetative Cover Material
- Section 8 – Stormwater Downdrains
- Section 9 – LFG Extraction System Components
- Section 10 – Decommissioning of the Leachate Pond
- Section 11 – Additional Work for Park Reuse Project

The North Wake Landfill Phase 2 Closure project was constructed in accordance with the North Carolina Solid Waste Management Rules 15A NCAC 13B, Section .1627 – Closure and Post-Closure Requirements for MSWLF Facilities, the permit conditions in accordance with the North Wake Landfill Permit 92-09, the approved February 9, 2004 Permit Amendment (see Section 8 of this report) and the construction documents prepared by Camp Dresser & McKee.

The final cover system consists of a minimum 12-inch thick intermediate soil cover layer (also serving as the liner subgrade), a textured 40-mil LLDPE geomembrane liner, a geocomposite drainage net, a minimum 18-inch thick protective soil cover layer (no permeability requirement), and a minimum 6-inch vegetative soil cover layer to promote growth and help stabilize the closure slopes.

1.1 General

Thalle Construction Company, Inc. was the general contractor responsible for all aspects of landfill construction. Geotechnics, was retained by Thalle Construction Co., Inc. as the Quality Control Laboratory (QCL) for conformance testing during the

project. Camp Dresser & McKee (CDM) was responsible for the Construction Quality Assurance (CQA) testing and oversight during construction of the North Wake Landfill Phase 2 Closure project. Quality assurance testing was provided by Terracon, Inc. as a subcontractor to Wake County.

The parties involved in the construction, testing, and construction observation services and their respective roles are summarized in the following table.

Party	Role
Camp Dresser & McKee (CDM)	Engineering Consultant --provided a full-time Resident Project Representative (RPR) for oversight of construction and quality assurance (QA) testing and general services during construction such as the coordination of progress meetings, clarification of design issues, troubleshooting of field problems, review of pay requests and shop drawings, issuance of change orders, closing out the project, and other administrative tasks.
Thalle Construction Company, Inc.	General Contractor responsible for construction of the North Wake Landfill Phase 2 Closure project.
Geotechnics, Inc.	Quality Control (QC) laboratory subcontracted by Thalle Construction to conduct conformance testing of the intermediate and protective cover soils, as well as the geomembrane liner and geocomposite drainage net, along with field verification of materials in place.
Hallaton, Inc.	Geomembrane liner and geocomposite drainage net installer subcontracted by Thalle Construction.
Terracon, Inc.	Quality Assurance (QA) laboratory subcontracted by Wake County to perform field compaction and laboratory testing in support of the Engineering Consultant.

Section 2
Earthwork

The earthwork performed for the Phase 2 Closure project included work activities required to provide a structurally stable foundation for the approximately 39.7 acre Phase 2 Closure area. Earthwork activities included stripping of vegetation, removal of decomposed leaf matter from the closure side slopes for use as vegetative cover, removal and replacement of any unsuitable materials, proof rolling of the prepared subgrade, replacement of intermediate cover after the stripping of vegetation to meet the minimum of 12-inch thickness requirement and preparation of the liner subgrade or surface of the intermediate cover layer for installation of the 40 mil LLDPE liner.

CQA oversight of the field testing was performed during earthwork activities by the CDM Resident Project Representative (RPR) to document conformance with the project specifications. Daily reports documenting project conformance and soil testing are presented in Appendix A-1 of this report. Field and laboratory test data associated with performing the earthwork activities are presented in Appendix A-2 through Appendix A-5 of this report.

All related earthwork activities, as presented in this and the following sections of this report, have been completed in accordance with the Contract plans and specifications, based on CDM's oversight and testing during construction and the certified record documents provided by the Contractor.

2.1 Site Preparation

Preparation of the site consisted of first removing the decomposed leaf matter from the closure area that was used to stabilize the closure side slopes during landfill operations. The leaf matter was stockpiled in the onsite borrow area for mixing with onsite soils to create vegetative cover material. In addition, site preparation included the stripping of vegetation, proof rolling the subgrade, undercutting unsuitable materials, repairing leachate breakouts, if encountered, and backfilling undercut areas prior to installation of the 40 mil LLDPE liner.

2.1.1 Unsuitable Soils and Organics Removal

CDM's RPR periodically observed site clearing and grubbing. The removal of organics and replacement of intermediate cover soils, as well as preparation of the liner subgrade were also observed. The RPR examined the exposed soil subgrade prior to further excavation or intermediate cover replacement to assure that the soil surfaces were generally free of organic matter, leachate breakouts or other objectionable materials.

2.1.2 Undercutting and Backfilling

The undercut of unsuitable materials typically consisted of the removal of surface organics encountered during stripping of vegetation from the closure side slopes. These undercut areas were backfilled with soils from the onsite borrow area during replacement of the intermediate cover material. No leachate breakouts were encountered and no undercutting and backfilling of the side slopes was needed for the Phase 2 Closure, other than to remove the surface organics and replace with intermediate cover material. All Phase 2 Closure side slopes were typically found to be stable.

2.2 Fill Placement and Testing

Approximately 58,000 CY of replacement intermediate cover soil was placed on the closure side slopes as part of subgrade preparation and to meet the 12-inch thickness requirement for the intermediate cover layer. The QC lab collected soil samples from the stockpiled intermediate cover material in the borrow area, as well as during placement of the intermediate cover on the closure side slopes to conduct the required conformance testing at the specified frequencies, as stated in the project specifications. The QC lab testing included Atterberg limits, grain size analyses, and moisture content tests along with standard Proctor tests on soil samples obtained from the onsite borrow area, as well as samples of the intermediate cover soils placed on the closure side slopes during construction. The results of the QC lab testing are presented in Appendix A-2 through Appendix A-5 of this report.

The intermediate and protective cover materials were specified to meet the following criteria:

- Compaction of the intermediate cover to a target density of 95% of the maximum dry density, in accordance with ASTM D698 and compaction of the protective cover to a target density of 92% of the maximum dry density.
- A maximum loose lift thickness of 8 inches for the intermediate cover soils,
- No oversize material (stones and/or roots > 3 inches in diameter), with no material > 1/2–inch in size on the surface of the liner subgrade,
- A maximum percent passing the No. 200 sieve of 50%,
- A maximum Liquid Limit of 50, and
- A maximum Plasticity Index of 15.

Intermediate cover materials were typically placed in less than 8-inch thick loose lifts. After the required 12-inch thick intermediate cover layer was placed and confirmed by survey, the liner subgrade was then compacted by tracking in the subgrade surface with low ground pressure dozers, in addition to using a smooth drum roller to achieve

a smooth subgrade surface prior to LLDPE liner placement. Stones larger than ½ inch in diameter, as well as sticks and roots, were then removed from the rolled surface by hand prior to installation of the 40-mil LLDPE geomembrane.

Placement of the intermediate and protective cover soils was observed by the CDM RPR. The fill soils were checked to verify the absence of topsoil, roots, rocks and wood debris and other deleterious or oversize materials. Lift thicknesses were monitored to verify that adequate compaction was being achieved.

Terracon, Inc. was retained by the County to perform quality assurance testing of the intermediate and protective cover materials to verify that the compaction (percent of maximum dry density) of both materials was being achieved. Shallow nuclear methods (ASTM D2922) were used to obtain field density test results. Compaction test results are presented in Appendix A-4 of this report.

One-point proctors were performed in the field to identify the maximum dry density of the fill being placed. A full proctor was performed on soil samples that did not provide a good match with the pre-established proctor curves. If the field density test results indicate that the in-place density of the fill was less than the required minimum compaction percentage the lift was reworked and retested.

Reworking the fill consisted of performing additional passes with the low ground pressure dozers to better track in the material along with the smooth drum to prepare the liner subgrade surface for liner installation. In addition, reworking included the option of scarifying the soil and allowing it to dry prior to recompaction when moisture contents exceeded the target 2-3% wet of optimum. Results of field density testing and moisture content checks are presented in Appendix A-4 of this report.

2.3 Onsite Borrow Area

Thalle Construction maintained positive drainage during borrow operations after installing erosion control measures in accordance with the erosion control permit approved by the NCDENR Land Quality section. In addition, Thalle Construction provided a final survey of the borrow area contours at the completion of the closure project, to be used by others for future development of the site. The borrow area survey has been included with this report and presented in Appendix D-1 of this report, along with the Record Drawings.

Section 3
Intermediate Cover and Liner Subgrade Preparation

This section outlines the construction quality control (CQC) and construction quality assurance (CQA) testing conducted prior to and during intermediate cover placement. Preparation of the intermediate cover on the closure side slopes included the removal of decomposed leaf matter used to stabilize the slopes during landfill operations, stripping of vegetation down to suitable intermediate cover material and adding intermediate cover layer material where needed to replace the material removed during stripping to meet the 12-inch minimum thickness requirement. Approximately 58,000 cubic yards of intermediate cover material was added to the closure slopes after stripping of the vegetation.

3.1 Material Description & Conformance Testing

Intermediate cover material excavated from the onsite borrow area was first screened to remove any oversize material and then stockpiled in the borrow area for conformance testing and moisture conditioning, prior to placing the material on the closure side slopes. Conformance testing was performed by Geotechnics, Inc. on behalf of Thalle Construction, in accordance with the testing frequency required in the project specifications. The testing frequency required that conformance tests be performed every 4,000 cubic yards for the intermediate cover placed during construction. The intermediate cover material was required to not exceed a maximum size of 3-inches, or exceed 50% passing the #200 sieve, a Liquid Limit of 50 and a Plasticity Index of 15, similar to the protective cover material. The intermediate cover material used for the closure construction met all these requirements. Moisture contents were also checked and held to no more than 2-3%wet of optimum based on laboratory proctor values. No intermediate cover material was allowed to be moisture conditioned on the closure side slopes per the project specifications. Results of the intermediate cover conformance testing are presented in Appendix A-2 of this report.

3.2 Intermediate Soil Cover Placement

The additional intermediate cover soil placed on the closure side slopes was placed as one lift on top of the intermediate cover remaining after stripping and spread with low ground pressure dozers to achieve the minimum 12-inch thickness requirement. GPS survey was used to verify that the minimum 12-inch thick intermediate cover layer had been placed.

A target compaction of 95 percent of the maximum dry density as determined by ASTM D698, was selected for the intermediate cover soils. A test pad was constructed in accordance with the specifications to establish the minimum compaction effort needed during the placement of intermediate cover (e.g. type equipment, number of passes,

direction of passes, etc.) to achieve the targeted compaction of 95%, in accordance with ASTM D-698. Proctor values and optimum moisture contents were established to monitor the compaction effort. A target 95% compaction effort was selected during placement of the intermediate cover to address the limited compaction effort that could potentially be achieved when placing intermediate cover soils over waste. Terracon, Inc. under the direction of CDM, performed periodic field density testing to monitor the compaction effort. Compaction test results are presented in Appendix A-4 of this report. The results of the field density testing indicate that the installed intermediate cover met and often times exceeded the minimum 95% compaction target.

3.3 Intermediate Cover Soil ThicknessVerification

In addition to the compaction control, verification of lift thickness was also performed. Thalle Construction verified the intermediate cover layer thickness by performing a field survey of the top of the waste and intermediate cover layer material based on same 100-foot grid used for the protective and vegetative cover materials. The survey shows that the difference in elevation between the top of the intermediate cover and the top of the underlying waste meets the minimum 12-inch thickness requirement at each grid point, as specified in the Contract documents. The Record Drawings showing the 100-grid points are presented in Appendix D-1 of this report. Each grid point was assigned a number with a corresponding number on the spreadsheet presented in Appendix D-2, verifying the minimum 12-inch thickness requirement for the intermediate cover layer at each grid point.

3.4 Liner Subgrade Preparation

Thalle prepared the liner subgrade (surface of the intermediate cover layer) just prior to installation of the 40-mil LLDPE liner, to include checking the intermediate cover for the proper moisture content and minimum compaction effort, as well as the removal of any remaining roots and/or stones greater than 1/2 inch in diameter, along with verifying that the intermediate cover layer met the minimum 12-inch thickness requirement. Prior to liner deployment, Thalle Construction had a team of laborers remove any remaining oversize material (e.g. stones and roots remaining on the subgrade surface). Any depression or hole from removed stones or roots were filled in to create a uniform surface for the LLDPE liner placement. Thalle then used a smooth drum roller to prepare the intermediate cover/liner subgrade for liner placement. Prior to LLDPE liner deployment, CDM and Hallaton representatives conducted a final visual inspection of the finished intermediate cover surface. Hallaton proceeded with liner deployment after the subgrade was accepted by CDM. Representative of CDM and Hallaton each signed a subgrade acceptance form for the panels deployed on each day of liner installation. Copies of the signed subgrade acceptance forms are included in Appendix B-6 of this report.

3.5 Borrow Sources

Materials used for intermediate cover were obtained from the onsite borrow area located to the east of the Phase 2 closure area. All soils within the onsite borrow area were made available for use by Thalle Construction. The area was used as the source of intermediate cover, as well as the protective cover soils for the Phase 2 Closure project.

Section 4
LLDPE Geomembrane Lining

The geomembrane liner specified for the Phase 2 Subtitle D landfill Closure project is a textured 40-mil linear low density polyethylene (LLDPE) liner manufactured by Agru America of Georgetown, South Carolina and installed by Hallaton Inc. of Towsen, Maryland. Hallaton, Inc. has certified that the 40-mil LLDPE liner has been properly installed in accordance with the Contract Documents and has prepared the LLDPE geomembrane Record Drawings presented in **Appendix D-3** of this report.

Hallaton Inc. was responsible for liner conformance testing, liner placement, welding activities, as well as onsite destructive and nondestructive testing. CDM provided construction oversight during the liner installation and conducted construction quality assurance (CQA) monitoring during installation of the liner to confirm that construction was performed in accordance with:

- The approved CQA plan
- The Permit Amendment application submitted by CDM, dated January 8, 2004
- The Phase 2 construction permit issued by the North Carolina Solid Waste Section (Permit No. 92-09)
- Phase 2 Closure Contract Documents
- Good engineering practice and
- Industry standards

The LLDPE liner CQC and CQA documents are presented in **Appendix B** of this report.

4.1 Preconstruction Submittals

Prior to installation of the LLDPE liner, CDM reviewed the LLDPE liner documentation submitted by Thalle Construction Company, Inc. for conformance with the project specifications including:

- LLDPE liner material qualification package and samples (**Appendix B-1**)
- Liner QC log (CQC-100) listing names and locations of all contacts for the project (**Appendix B-3**)
- LLDPE welding crew personnel qualifications (CQC-102)(**Appendix B-4**)

- Tensionmeter calibration certificate (**Appendix B-5**), and
- Preconstruction CQA documentation provided by Hallaton Inc.

All submittals were reviewed and approved by CDM prior to installation of the liner.

4.2 Geomembrane Certification and Conformance Testing

An identification sticker was attached to each roll identifying the manufacturer, material type, and roll number. Material certifications for each roll were also submitted prior to delivery at the construction site. As part of the CQA procedure, CDM reviewed the material certifications to verify that the material test values met the minimum criteria specified in the project documents, and that the rolls were representative of the rolls tested by the manufacturer. CDM also verified that the rolls delivered to the site had the same identification numbers as shown on the certificates. Receiving logs (CQC-101) for the 40-mil LLDPE are presented in **Appendix B-7** of this report.

The following conformance tests were conducted on representative samples taken from the 40-mil LLDPE liner prior to delivery:

- Thickness (ASTM D5994)
- Density (ASTM D1505)
- Tensile Proprieties (ASTM D6693)
- Tear Resistance (ASTM D1004)
- Puncture Strength (ASTM D 4833)
- Carbon Black Content (ASTM D4218)
- Carbon Black Dispersion (ASTM D5596)

A total of 154 rolls were delivered to the site. Agru America provided conformance test results at a minimum frequency of 1 per 100,000 square feet or one sample per lot, whichever resulted in the highest number tests, prior to delivery. All rolls were pre-certified by the manufacturer prior to shipment. Quality control certificate forms for each roll delivered to the site and signed by the manufacturer's quality control manager are provided in **Appendix B-8** of this report. Conformance sampling was performed at the liner manufacturer's facility prior to delivery. The conformance tests results were reviewed and approved by CDM prior to installation of the liner. Of the total 154 rolls delivered, a total of approximately 195,688 square yards were installed for which 20 liner samples were taken for conformance testing. See Appendix B-8 for liner conformance test results.

4.3 Subgrade Inspection and Liner Deployment

Thalle prepared the LLDPE subgrade (i.e. surface of the intermediate cover layer) in areas where they could install the 40-mil LLDPE liner the same day. CDM's onsite representative inspected the intermediate cover layer/liner subgrade surface prior to liner deployment. CDM evaluated the intermediate cover for moisture content, as well as the presence of roots and stones greater than 1/2 inch in diameter, along with making sure that the side slope met the uniform grade requirements. CDM also reviewed the certified survey submitted by Thalle Construction verifying that the intermediate cover layer met the minimum 12-inch thickness requirement.

Prior to liner deployment, Thalle Construction had a team of laborers remove any remaining oversize material (e.g. stones and roots remaining on the subgrade surface). Any depression or hole from removed stones or roots were filled in to create a uniform surface for the LLDPE liner placement. Thalle then used a smooth drum roller to prepare the intermediate cover/liner subgrade for liner placement. Prior to LLDPE liner deployment, CDM and Hallaton representatives conducted a final visual inspection of the finished intermediate cover surface. Hallaton proceeded with liner deployment and seaming after the subgrade was accepted by CDM. Representative of CDM and Hallaton each signed a subgrade acceptance form for the panels deployed on each day of liner installation. Copies of the signed subgrade acceptance forms are included in **Appendix B-6** of this report.

Liner panels were placed in their deployment positions using a Gradall with spreader bar and the liner rolled downhill on the approved subgrade utilizing an all-terrain vehicle (ATV). Hallaton personal aligned each panel with the adjacent panel to ensure a proper overlap for seaming purposes. After each panel was deployed, CDM inspected the deployed roll for physical defects. Defects, if present, were clearly marked with fluorescent paint and subsequently repaired by Hallaton in accordance with the specification standards and to the satisfaction of CDM representative. Hallaton marked the beginning and end of each panel with the panel I.D. number, date, and roll number. The LLDPE Liner Installation Tracking Log is presented in **Appendix B-9** of this report. The tracking log indicates which liner rolls were used for each panel and the date the liner was deployed. This information is also shown on the installed liner Record Drawings presented in Appendix D-3 of the report.

4.4 Liner Seaming

The seaming of the liner panels was conducted using a dual track hot wedge welder and an extrusion welder. The dual track hot wedge welder was the primary seaming method used to join adjacent liner panels, while the extrusion welder was used for patching, detail, and work areas inaccessible to the hot wedge welder, such as cross seams.

4.4.1 Pre-weld Seams

At start of each shift, a pre-weld sample was obtained for each welding and extrusion machine. The pre-weld sample was taken to verify that the welding and extrusion machine for each location (temperature, voltage and speed) was set correctly to yield an approved seam. A total of 137 pre-weld seam samples were taken. A total of six specimens, each approximately 1-inch in width by 6-inches in length, were cut from each pre-weld seam sample. Three specimens were tested in the field for peel strength and three specimens for shear strength using an approved tensiometer supplied by Hallaton. A calibration certificate for the tensiometer is provided in **Appendix B-5** of this report. Each hot wedge weld specimen was required to achieve a minimum peal strength of 50 lb/in and a minimum shear strength value of 60 lb/in. Each extrusion weld specimen was required to achieve a minimum peal strength value of 44 lb/in and a shear strength value of 60 lb/in. Pre-weld seam testing results are presented in **Appendix B-10** of this report. All pre-weld seam samples met their required strengths.

4.4.2 Production Seams

After achieving passing results of the pre-weld specimens, CDM allowed Hallaton to proceed with liner welding. Hallaton and CDM inspected all liner surfaces (to be welded) for mud, sand, dirt and moisture. Liner surfaces found to be unacceptable were cleaned prior to welding. Upon completion of each seam, CDM conducted a visual check of each seam for uniformity, workmanship, and defects. Any flaws observed by CDM were clearly marked on the liner and subsequently repaired by Hallaton to the specification standards. All production seam locations and repair locations were recorded on the LLDPE geomembrane liner and presented with the installed liner Record Drawings in Appendix D-3 of this report.

Sand bags were installed along the edges of liner panel seams that were not welded to protect against wind uplift, upon the completion of each days seaming operation.

4.5 Seam Testing

Completed seams were tested using non-destructive and destructive seam testing methods. All seams were subject to non-destructive testing. Samples for destructive testing were obtained after the seam passed the non-destructive testing.

4.5.1 Non-destructive Seam Testing

The non-destructive testing method utilized pressure testing. Air pressure testing was utilized to test the void space between the two welds of the dual track wedge welder. A vacuum test was used to test areas sealed with the extrusion welder (patches, cross seams, and detail work).

Air pressure testing was conducted by pressurizing the void space between the two welds by plugging one end of the seam and by introducing air through the other end with a needle fitted pump equipped with a pressure gauge and valve. The void space

was pressurized to a minimum of 30 psi, and the valve shut to maintain the pressure. The pressure was then monitored for 5 minutes. A pressure drop of no more that 3 psi over a 5 minute period was required to pass the air pressure test. After a seam passed the air pressure test, the pressure was realized from the plugged end to ensure that the entire length of the seam had been pressurized.

Occasionally, the air pressure test would detect a blockage, which prevented the entire seam length from being pressurized. For seams where blockages were discovered, Hallaton patched the point of blockage and continued air testing the remaining length of seam. CDM observed the pressure testing and recorded the information on the appropriate forms included in **Appendix B-11** of this report.

Vacuum tests of areas sealed with the extrusion welder (patches, cross seams, and detail work) were performed by first applying a soapy solution to the surface of the seam being tested. A rectangular vacuum box with a plexiglass viewing window was placed over the seam and a 5-psi vacuum applied to the seam for a period of not less than 10 seconds. The seam was observed through the viewing window for the presence of soap bubbles. No bubbles indicated a good seam. Hallaton documented each test by marking the liner and noting the date and acceptance of all vacuum tests performed. Any failing location was marked and repaired by Hallaton. Repaired seams were then vacuum tested again to verify that the repairs had been satisfactorily completed. CDM observed the vacuum testing and recorded the information on the appropriate forms included in Appendix B-11 and **Appendix B-14** of this report.

4.5.2 Destructive Seam Testing

Destructive seam testing was performed on the field seams at a minimum rate of one sample per machine for every 500 linear feet of seam length. Destructive samples were often taken along seam lengths which were difficult to complete or where the welding machines may have exhibited malfunctions. Examples of difficult areas included panels which required extra cleaning or realignment during the seaming process, or where seaming was performed using low welding voltages.
CDM identified each destructive sample location and instructed Hallaton to obtain the sample. Each sample was approximately 3 feet in length by 12 inches in width. The sample was divided into three one foot long samples. The first sample was tested o site by Hallaton and the second sample then archived by CDM. The sample tested by Hallaton was divided into a total of six specimens, each approximately 1-inch in width by 6-inches in length. The tensionmeter was used to test three specimens for peel strength and three for shear strength. If the field test requirements were met for each of the six specimens, the third sample was then forwarded to an independent testing for further testing. The independent laboratory tested the samples for peel and shear strength in accordance with GRI GM 19. Both sides of each weld specimen were tested for peel strength. Each destructive sample was required to achieve the following:

Peel Adhesion
A minimum load at yield of 50 lb/in width (hot wedge weld) and 44 lb/in width (extrusion weld)

Bonded Shear strength
A minimum load at yield of 60 lb/in width

A total of approximately 86,000 linear feet of seams were welded for which 173 samples were obtained and tested. All samples passed the laboratory testing. A destructive seam testing log summarizing the destructive seam test results is presented in **Appendix B-12** of this report. Laboratory destructive seam test results are presented in **Appendix B-13** of this report.

4.6 Issues and Resolutions

During construction and prior to installation of the final soil cover, it was observed where a buildup of landfill gas under the installed 40 mil LLDPE liner was occurring at sporadic locations, resulting in gas bubbles under the installed liner. Cuts were made in the liner at these locations to release the gas and to reduce stress on the liner. Patches were then made by Hallaton after releasing the landfill gas using extrusion welds and the patched areas surveyed by Thalle Construction. Final soil cover was placed in patched areas immediately following vacuum testing of the completed repairs.

The CDM onsite representative also inspected each gas pipeline trench excavated in the protective soil cover during installation of the gas system improvements by others. The locations where damaged liner was observed were documented by CDM, surveyed by Thalle Construction and repaired by Hallaton using the same protocols as outlined above. Surveyed patch locations are presented in **Appendix B-15** of this report.

Section 5
Geocomposite Drainage Net

Hallaton Inc., as subcontractor to Thalle Construction, installed the geocomposite drainage net after installation of the 40-mil LLDPE liner had been completed and in areas where approved sample destructs had been received for the installed 40-mil LLDPE liner. CDM visually inspected all approved areas of completed liner prior to installing the drainage net to address any remaining repair locations.

The drainage net layer consists of the following layers (from top to bottom):

1. 6 oz. geotextile fabric,
2. drainage net, and
3. 6 oz. geotextile fabric.

The drainage net is sandwiched between and fused to the upper and lower geotextile fabrics as listed above. The lower fabric is intended to provide a frictional interface between the textured side slope liner and the drainage net layer. The lower fabric also aids in preventing imprinting of the drainage net on the liner, while the upper layer is intended to prevent soil intrusion from the protective cover soil into the openings of the drainage net.

5.1 Conformance Testing

Approximately 195,688 square yards of geocomposite drainage net was installed directly above and in uniform contact with the underlying 40-mil LLDPE textured liner within the limits of the Phase 2 Closure area. The liner manufacturer was responsible for providing quality control certificates and test results at a frequency of one per 50,000 square feet of manufactured drainage net composite. Samples of the drainage net were also obtained for conformance testing at a frequency of one sample per 100,000 square feet of installed material or at least once per lot whichever was greater. Based on CDM's review of the manufacturer's quality control certificates and conformance test results, all drainage net geocomposite was considered to be in compliance with the Contract documents. The Manufacturer's quality control certification reports for the drainage net composite material are provided for review in **Appendix C-1**, whereas conformance test results are included in **Appendix C-2** of this report.

5.2 Geocomposite Installation

The panels were deployed following the same panel layout as the underlying 40 mil LLDPE liner. The seams were positioned parallel with the slopes, with the exception of areas with compound slopes, in which perpendicular seams could not be avoided. The panels were positioned in direct contact with adjacent panels and were joined by fastening the drainage net with plastic ties. The ties were placed every 5 feet in areas where the seam laid perfectly parallel with the slopes. In areas where the seam laid in

a somewhat diagonal orientation to the slopes or in areas of possible stress, the tying frequency increased to one tie every 6 inches. The 6-inch spacing pattern was also used in the anchor trenches, and for joining to the ends of panels. End panels were overlapped a minimum of 1 foot in the primary direction of flow.

CDM inspected the drainage net panels for areas where damage had occurred during staging and/or installation. Damaged drainage net sections were repaired by using plastic ties to repair the torn geonet and then using a patch wide enough to provide a sufficient overlap for fastening to the underlying panel. Following the completion of drainage net tying, the geotextile fabric ends were neatly overlapped and bonded together using a hot wedge weld or by sewing. This was performed to ensure that the protective soil cover would not intrude into the drainage net openings. Sandbags were also used along the exposed edges of the composite panels to prevent wind uplift after placement. At the conclusion of the overlap bonding operation, the protective soil layer was then placed directly on top of the geocomposite drainage net.

Drainage flaps were also installed immediately upslope of each berm/swale on the closure side slopes as a drainage outlet for the drainage net. Flow from the drainage flaps was then discharged to each berm/swale and into the downdrains to control surface infiltration and discharge of the stormwater runoff.

Section 6
Protective Cover

The protective soil cover layer consists of a minimum 18-inch thick layer of soil placed directly above the 40-mil LLDPE liner and geocomposite drainage net in order to protect the liner system, as specified in the North Carolina Solid Waste Regulations.

6.1 Material Description and Conformance Testing

Protective cover materials were excavated from the onsite borrow area located to the east of the Phase 2 closure. Suitable protective cover materials were first screened to remove any oversize material and then stockpiled in the borrow area for conformance testing and moisture conditioning prior to placing on the closure slopes. Conformance testing was performed by Geotechnics, Inc. on behalf of Thalle Construction in accordance with the testing frequency required in the project specifications. All protective cover was required to not exceed a maximum size of 3-inches, or exceed 50% passing the #200 sieve, a Liquid Limit of 50 and a Plasticity Index of 15. No permeability requirement was specified for the protective cover material. All protective cover materials used for the closure construction met these requirements. Moisture contents were also checked and held to no more than 2-3%wet of optimum based on laboratory proctor values. No protective cover material was allowed to be moisture conditioned on the closure side slopes per the project specifications. Conformance test results are presented in Appendix A-3 of this report.

6.2 Protective Soil Cover Placement

The 18-inch thick protective cover layer was placed on top of the 40-mil LLDPE liner and geocomposite drainage net material with low ground pressure dozers, in accordance with the project specifications. The protective cover material was placed as one lift to protect the liner system. Temporary haul roads consisting of a minimum of 4 feet of protective cover material were first constructed to protect the liner components from heavy construction equipment. Truck traffic was restricted to the thickened haul road sections. The protective cover was then spread out from the temporary haul roads and tracked in place using low ground pressure dozers to obtain a uniform thickness and to achieve a minimum compaction effort of 92%, in accordance with ASTM D-698. As the material was spread, the haul roads were cut down to the minimum required thickness and incorporated into the final cover. GPS survey equipment was used to verify that a minimum 18-inch-thick protective cover layer had been achieved. A total of 96,800 CY of protective cover soil or 193,600 SY at a depth of 18-inches was placed during construction of the Phase 2 Closure.

A test pad was constructed per the specifications to establish the minimum compaction effort needed during placement of the protective cover layer (e.g. number of passes with a low ground pressure dozer, direction of passes, etc.) to achieve a minimum 92%

compaction of the protective soil cover layer. Proctor values and optimum moisture contents were established to monitor the compaction effort. The 92% compaction effort was identified during design as a target density given the limited compaction effort that may be achieved when placing the protective cover material over waste.

Terracon, under CDM's direction performed periodic field density testing to monitor the compaction effort. The results of the compaction monitoring are presented in Appendix A-4 of this report. Based on the results of the field density testing, the installed protective cover met and often times exceeded the minimum 92% compaction requirement.

6.3 Protective Cover Layer Thickness Verification

Thalle Construction verified the protective cover layer thickness by performing a field survey of the top of the protective cover layer on a 100-foot grid. Their survey shows that the difference in elevation between the top of the protective cover layer and the top of the underlying intermediate cover layer, liner & geocomposite drainage net meets the minimum 18-inch thickness requirement at each grid point, as specified in the Contract documents. The field survey and the 100-grid points are shown on the Record Drawings presented in **Appendix D-1** of this report. Each grid point has been assigned a number with a corresponding number on the spreadsheet presented in **Appendix D-2**, verifying the minimum 18-inch thicknesses requirement for the protective cover layer at each grid point.

Section 7
Vegetative Cover Material

The vegetative cover material consists of a 6-inch thick layer of organic enhanced soil capable of supporting vegetative growth for stabilization of the closure side slopes. As a side benefit, the vegetative cover layer also served as an improved erosion control measure during the final stages of construction.

7.1 Material Sources

It was determined prior to start of the project that the vegetative cover material for the landfill closure would come from three sources:

- Suitable organic material from the onsite borrow area,
- A mixture of suitable soil from the onsite borrow area with decomposed organic leaf matter, and
- A suitable offsite source of organic soil, if onsite material from the above sources was not available in sufficient quantity.

The preferred source during construction was to use a mixture of suitable onsite soils from the borrow area with decomposed organic leaf matter to cover the entire 40-acre closure area. Decomposed leaves placed by Wake County during previous landfill operations were used to help stabilize the landfill side slopes. The decomposed leaves on the side slopes were first removed and stockpiled in the borrow area to mix with onsite borrow soils to create vegetative cover material. During the closure, the County also negotiated with the City of Raleigh to have additional leaf matter delivered to the project site to provide the organic source material needed to create vegetative cover material. As a result, additional leaf matter was brought into the site during construction. In addition, pockets of suitable organic soils encountered in the onsite borrow area were also set aside to use as vegetative cover material without mixing or to mix with onsite borrow soils, depending on organic content. A target 8% organic content was used to best support and sustain growth on the closure side slopes. Testing of the vegetative cover material during placement on the side slopes revealed that some areas did not meet the 8% organic target. As a result, a number of locations were supplemented with a spray on additive to help support growth. See Section 7.4 below. The primary source of vegetative cover material used for the project was the mixture of onsite soils with decomposed organic leaf matter. No organic material was needed from offsite borrow sources to complete the project.

7.2 Vegetative Cover Placement

The 6-inch vegetative soil cover layer was placed directly on top of the 18-inch thick protective soil cover layer using low ground pressure dozers in accordance with the contract specifications, resulting in a total cover thickness of 24-inches. Temporary

haul roads consisting of a minimum of 4 feet of cover material were used to protect the liner components from heavy construction equipment. Truck traffic was restricted to the thickened haul road sections. As the material was spread, the haul roads were cut down to the minimum required thickness and incorporated into the final cover. Vegetative cover material from the temporary haul roads were spread into adjacent areas using low-ground pressure dozers to obtain a uniform thickness, as well as a minimal compaction effort by tracking in the material after spreading. No compaction testing was performed on the vegetative cover layer. GPS survey verified that the minimum 6-inch thick vegetative cover layer was being uniformly placed during construction. A total of 31,915 CY of vegetative cover material or 191,494 SY at a depth of 6 inches was placed during construction.

7.3 Vegetative Cover Thickness Verification

Thalle Construction verified the vegetative cover layer thickness by performing a field survey of the top of the vegetative cover layer on a 100-foot grid. Their survey shows that the difference in elevation between the top of the vegetative cover layer and the top of the underlying protective cover layer meets the minimum 6-inch thickness requirement at each grid point, as specified in the Contract documents. The field survey and the 100-grid points are shown on the Record Drawings presented in **Appendix D-1** of this report. Each grid point has been assigned a number with a corresponding number on the spreadsheet presented in **Appendix D-2**, showing the surveyed thicknesses at each grid point.

7.4 Organic Content Tests and Application of Additive

CDM and Wake County agreed during the project to sample the vegetative cover material placed on the landfill side slopes to verify the organic content. A target organic content of 8% was used. The areas where the organic content was less than 2% was improved using an additive called Base Actisol ®. This additive was uniformly sprayed at a rate of 8 gallons of Actisoil in 500 gallons of water per acre. A total of approximately 10 acres was treated with Actisoil. The Engineer's onsite representative observed the spray on application of the additive. Appendix A-6 presents the vegetative cover material sampling results and the areas where Actisoil was used.

7.5 Park Reuse Area

A lawn quality topsoil material was obtained from an offsite borrow source for use in the crown area of the North Wake Landfill closure, as part of the Landfill Reuse project. A bucket sample of the topsoil material was provided to CDM for analysis prior to installation. A 6-inch thick layer of topsoil was placed above the additional 24 inches of protective cover soil, for a total of 4 feet of material in the crown area for use by others in constructing the park.

Section 8
Stormwater Downdrains

Stormwater downdrains were installed within the Phase 2 Closure area by Thalle Construction in accordance with the details presented by CDM in the January 2004 Permit Amendment application. A copy of the approved Permit Amendment is attached to this section of the report. The Engineer's onsite representative observed installation of the downdrains to verify that the work was performed in accordance with construction drawings and project specifications.

The downdrains consist of dual wall 18-inch corrugated HDPE pipe with watertight joint connections. Prior to pipe installation, a trench was excavated within the existing intermediate cover soils and into the waste below for the purpose of setting the top of the downdrains flush with the surface of waste. In this manner the downdrain installations will not protrude above the surface of the final cover, thereby eliminating any surface features that could potentially increase the likelihood of channelized flows from stormwater runoff and resulting surface erosion. A minimum of 12 inches of compacted intermediate cover soil was placed in the bottom of the trench prior to installation of the LLDPE liner and composite drainage net. A minimum of 6 inches of compacted protective cover soil was then placed on top the geocomposite drainage net within the trench prior to the placement of the downdrain pipe. Backfilling around and above the pipe was performed in general accordance with the pipe manufacturer's recommendations. A minimum of 12 inches of soil cover was then placed above the pipe to coincide with the intermediate cover layer.

Laterals from the downdrains were installed to intercept stormwater collected within the final cover swales on the closure slopes. HDPE flared end sections were installed at the termination of each lateral to capture the stormwater runoff. A soil mound was constructed between each pair of flared end sections to direct flow to each individual drainage lateral, which during high flow events or blockage of the adjacent flared end section, provided redundancy in being able to accept flows. One inch diameter stainless steel pipe was installed in lieu of the HDPE crossbars at the openings to the flared end sections to serve as trash guards and as safety screens for landfill maintenance personnel and park patrons.

The extension of downdrains beneath final cover swales requires the pipe to pass through the LLDPE liner/composite drainage net flap that allows drainage collected within the drainage net to discharge into the drainage swale. Boots were not required for this non-critical penetration. The Contractor was required to closely trim the geosynthetics around this penetration to minimize bypass seepage from the flap.

A larger 24-inch diameter corrugated pipe was installed at the end of each downdrain to dissipate the discharge of stormwater into the perimeter stormwater ditch by creating a hydraulic jump in the flow.

CDM
5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
tel: 919 787-5620
fax: 919 781-5730

January 8, 2004

Mr. William D. Sessoms
Environmental Engineer
NCDENR Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, NC 27699-1646

Subject: Draft Permit Amendment Application
North Wake Subtitle D Landfill Closure

Dear Mr. Sessoms:

Attached are three (3) copies of the Draft Permit Amendment Application for the North Wake Subtitle D Landfill Closure. The purpose of this Permit Amendment Application is to revise the existing NCDENR permit to reflect the closure design modifications that were previously agreed to during discussions between Wake County and CDM.

If at all possible, please forward any comments to me by Thursday, January 15, 2004 so any necessary changes can be addressed to bidders for the closure project before the scheduled bid opening on January 22, 2004. After approval of this draft application is received from the SWS, final signed and sealed copies will be provided.

Please feel free to contact me if you have any questions. I will be happy to meet with you to facilitate your review.

Very truly yours,

Thomas M. Yanoschak, P.E.
Project Manager
Camp Dresser & McKee

Attachment: as noted

xc: P. Stout, Wake County
J. Beal, Wake County
J. Wiseman, CDM
J. Reynolds, Wake County
B. Brossoie, CDM
T. Esqueda, CDM

NCDENR

North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director | Division of Waste Management | Michael F. Easley, Governor
William G. Ross Jr., Secretary

Post-it® Fax Note 7671	Date 2/10	# of pages ▶ 4
To TOM YANOSCHAK	From B. H Sessoms	
Co./Dept. CDM	Co. DWM	
Phone #	Phone # 733-0692	
Fax # 781-5730	Fax #	

FACILITY PERMIT NO: 92-09
Part 1-Permit to Construct
Date of Original Issue: October 19, 1984
Permit Amendment: October 7, 1993
Permit Renewal: May 14, 1997
C&D Unit: November 1, 2000
MSW Closure Modification: February 9, 2004

MUNICIPAL SOLID WASTE LANDFILL

FACILITY PERMIT

COUNTY OF WAKE

is hereby issued a PERMIT to CONSTRUCT a

MUNICIPAL SOLID WASTE LANDFILL FACILITY

CONSTRUCTION AND DEMOLITION UNIT

Accessed via Durant Road, S.R. 2006, Wake County, North Carolina in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit.

James C Coffey

James C. Coffey, Chief
Solid Waste Section

D:\SESSOMS\PROJECTS\N-Wake\ptc-9209-2-msw.wpd

ATTACHMENT 1

Approved Documents

PART I: GENERAL FACILITY CONDITIONS

PART II: MUNICIPAL SOLID WASTE LANDFILL CONDITIONS

1. *Permit Amendment Application, North Wake Subtitle D Landfill Closure, NCDENR Permit No. 9209*, dated January, 2004, prepared by Camp Dresser & McKee.

PART III: CONSTRUCTION AND DEMOLITION LANDFILL CONDITIONS

PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL CONDITIONS

PART V: YARD WASTE CONDITIONS

PART VI: MISCELLANEOUS TREATMENT AND PROCESSING FACILITIES CONDITIONS

ATTACHMENT 2

PART I: GENERAL FACILITY CONDITIONS

FACILITY CONSTRUCTION CONDITIONS

FACILITY PRE-OPERATIVE CONDITIONS

PART II: MUNICIPAL LANDFILL UNIT SPECIFIC CONDITIONS

CONSTRUCTION CONDITIONS

1. Wake County shall conduct a pre-construction meeting, on-site, prior to initiating construction of any unit at the site and shall notify the Solid Waste Section 10 days prior to said meeting.

2. Construction of all solid waste management units within this facility shall be in accordance with the pertinent approved plans and only for those phases of development approved for construction as described in Attachment 1, "Approved Documents".

3. Additional conditions and revisions of the approved plans or documents or changes during construction of any landfill unit require approval by the North Carolina Solid Waste Section.

4. Sedimentation and erosion control activities require approval by the North Carolina Land Quality Section. The North Carolina Solid Waste Section shall be notified of any sedimentation and erosion control modifications.

5. The owner's geologist shall be in the field to supervise all well installations. Any modifications to the approved water quality monitoring plan require approval by the Section Hydrogeologist. Documentation of all changes to the approved plan shall be submitted with the well construction records.

6. For each monitoring well constructed, a well construction record, well schematic, boring log and a description of well development activities shall be submitted to the Section within 30 days upon well completion.

7. Site preparation shall be in accordance with the approved plans, and the conditions specified herein.

8. Upon completion, a site inspection shall be made by a representative of the Solid Waste Section.

9. Financial Assurance, as required by 15A NCAC 13B .1628, shall be in place and maintained.

PRE-OPERATIONAL CONDITIONS

PART III: CONSTRUCTION AND DEMOLITION DEBRIS UNIT SPECIFIC CONDITIONS

PART IV: LAND CLEARING AND INERT DEBRIS UNIT SPECIFIC CONDITIONS

PART V: YARD WASTE UNIT SPECIFIC CONDITIONS

PART VI: MISCELLANEOUS TREATMENT AND PROCESSING UNIT SPECIFIC CONDITIONS

Section 9
Landfill Gas Collection System Components

Phase 2 closure of the Subtitle D landfill included the installation of new vertical LFG collection wells, new vacuum header installations along with extension of the main gas collection header, new lateral connections from gas headers to vertical gas wells and valve operators to control the applied vacuum. This work was the responsibility of DTE Biomass as the independent LFG developer at the North Wake Landfill site. Black Rock Engineers was contracted by DTE Biomass to design the improvements to the LFG collection system. This work was coordinated with Thalle Construction, but not included in the construction contract with Thalle Construction. The American Environmental Group (AEG) was retained by DTE Biomass as their subcontractor to install the above gas collection system improvements. All vertical LFG collection wells were installed prior to the start to the Phase 2 construction project. However, not all new vertical gas wells were connected to a vacuum source until the LFG collection system improvements were complete.

The Phase 2 Closure was divided into two construction stages along a predetermined boundary with stage one representing the north half of the closure area, together with the east and west side slopes, with stage two representing the south half of the closure area. A detail showing the staging areas is presented at the end of this section. Staging of the closure area construction was set up to accommodate DTE Biomass' installation of their LFG collection system improvements without having both Thalle Construction and AEG working in the same area of the closure at the same time.

9.1 Construction of LFG System Piping

After installation of the 40 mil LLDPE geomembrane liner and 18-inch soil protective layer by Thalle Construction in stage one, AEG was allowed to move into the stage one area to install the new gas collection system piping and lateral vacuum connections to each of the new vertical gas wells. All new LFG collection system piping was installed above the geomembrane liner following installation of the 40 mil LLDPE liner and protective soil cover layer by Thalle Construction. AEG was held responsible for protecting the liner and making any repairs as needed to the liner while working in each staged area. CDM inspected each excavated pipe trench in the protective soil cover layer prior to AEG installing the pipe and prior to AEG backfilling the installed piping. Any damage to the liner was recorded by CDM, the location surveyed and repairs made by Hallaton, Inc. the liner installer for Thalle Construction. As AEG completed installation of the LFG system piping in stage one, the stage one area was turned back over to Thalle Construction to finish regrading the 18-inch protective soil cover layer, as well as install the drainage berms and swales, install the 6-inch vegetative soil cover layer and permanent seed the side slopes. The staging of work areas between Thalle Construction and AEG was repeated for stage 2. Black Rock Engineers on behalf of DTE Biomass and SCS Engineers on behalf of Wake

County provided oversight of the work being performed by AEG. Black Rock Engineers prepared the record drawings for the completed LFG collection system. Record drawings for the completed LFG collection system improvements are to be made available by DTE Biomass and as a result have not been included in this report.

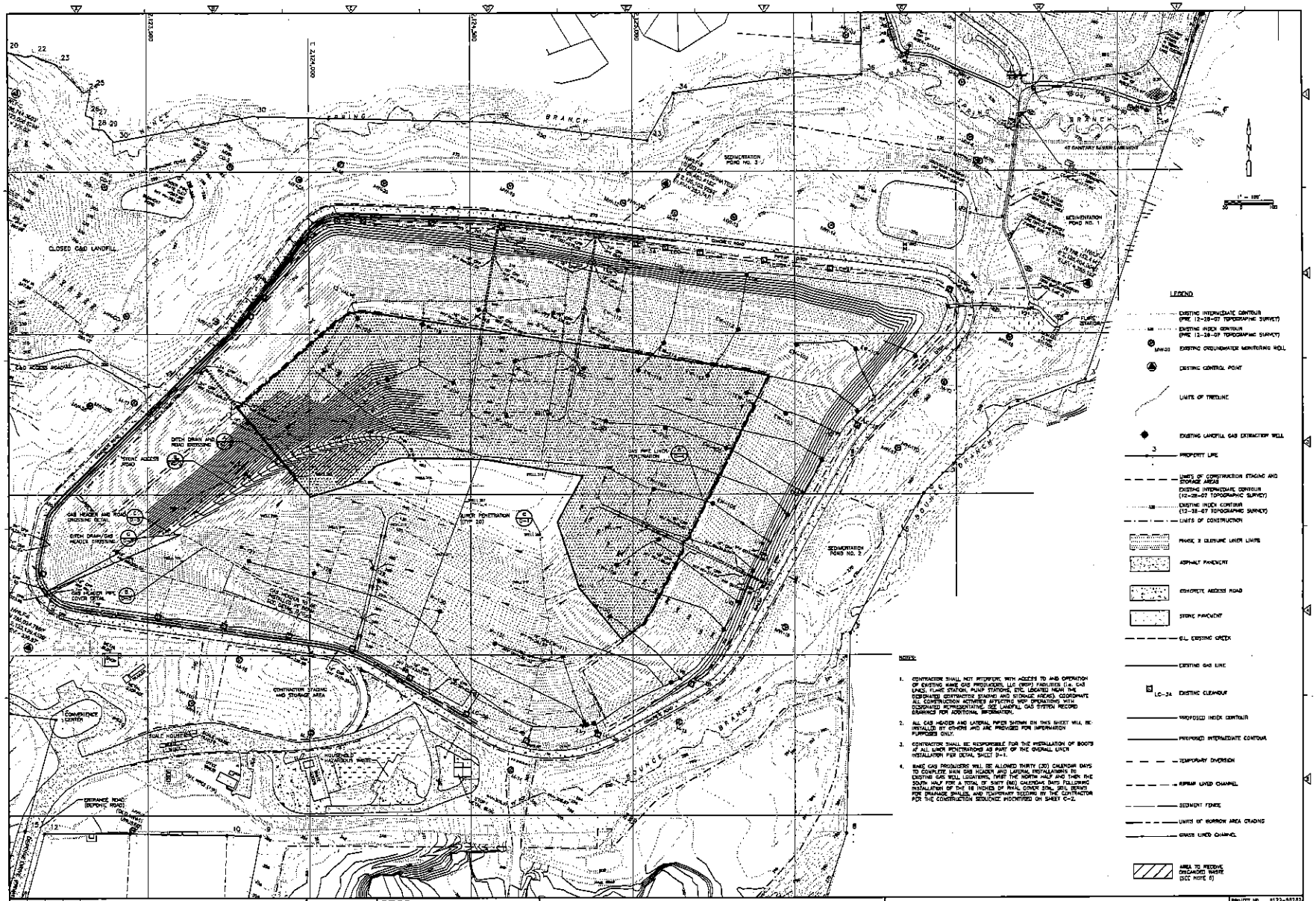
9.2 Coordination with Phase 2 Closure Construction

With the ongoing generation of landfill gas, installation of the closure cap and the need to install LFG piping to new vertical gas wells it became necessary on a daily basis to disconnect vacuum to existing wells and to restore as many vacuum connections as possible at the end of each work day. This was done to maintain vacuum on the landfill to control LFG emissions, as well as LFG odors. This was coordinated by CDM on a daily basis through oversight by the Engineer's field representative and by meetings in the field between AEG, DTE Biomass and CDM on an as needed basis. Every effort was made to reconnect the vacuum to each of the vertical gas wells at the end of each workday.

9.3 Inspection of Liner Penetrations at Vertical Gas Wells

Liner subgrade preparation, liner installation and placement of the protective cover soil at each vertical gas well location was observed by the Engineer's onsite representative to document that no damage had occurred to the liner or the gas system components. LLDPE liner penetrations for the installed vertical gas wells were installed by Hallaton, Inc., in accordance with the details shown on the construction drawings. A PVC slip casing with a minimum 1-inch annular space between the slip casing and the vertical gas well riser was installed per the construction details. The annular spacing was then sealed with hydrated bentonite. The field fabricated 40 mil LLDPE boot was then welded to the liner and attached to the slip casing, using silicone caulk and two stainless steel worm drive clamps. Well riser extensions if needed were performed by AEG. All gas well risers extend a minimum of four feet above the installed closure cap.

All liner penetrations at vertical gas wells were inspected by the Engineer's onsite representative for compliance with the details shown on the construction drawings. Extruded seams between the boots and the LLDPE liner were vacuum tested by Hallaton, Inc. and observed by the Engineer's onsite representative.



NOTES:

1. CONTRACTOR SHALL NOT INTERFERE WITH ACCESS TO AND OPERATION OF EXISTING WAKE GAS PRODUCERS, LLC (WGP) FACILITIES (i.e. GAS LINES, FLARE STATION, PUMP STATIONS, ETC. LOCATED NEAR THE DESIGNATED CONTRACTOR STAGING AND STORAGE AREAS). COORDINATE ALL CONSTRUCTION ACTIVITIES AFFECTING WGP OPERATIONS WITH DESIGNATED REPRESENTATIVE. SEE LANDFILL GAS SYSTEM RECORD DRAWINGS FOR ADDITIONAL INFORMATION.
2. ALL GAS HEADER AND LATERAL PIPES SHOWN ON THIS SHEET WILL BE INSTALLED BY OTHERS AND ARE PROVIDED FOR INFORMATION PURPOSES ONLY.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF BOOTS AT ALL LINER PENETRATIONS AS PART OF THE OVERALL LINER INSTALLATION PER DETAIL SHEET D-1.
4. WAKE GAS PRODUCERS WILL BE ALLOWED THIRTY (30) CALENDAR DAYS TO COMPLETE MAIN GAS HEADER AND LATERAL INSTALLATIONS TO EXISTING GAS WELL LOCATIONS, THRU THE NORTH HALF AND THEN THE SOUTH HALF FOR A TOTAL OF SIXTY (60) CALENDAR DAYS FOLLOWING INSTALLATION OF THE 18 INCHES OF FINAL COVER SOIL, SOIL BERMS FOR DRAINAGE SWALES, AND TEMPORARY SEEDING BY THE CONTRACTOR PER THE CONSTRUCTION SEQUENCE INDENTIFIED ON SHEET C-2.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: P. STOUT
DRAWN BY: P. STOUT
CHECK CHK'D BY:
APPROVED BY:
DATE: SEPTEMBER 2008

CDM

WAKE COUNTY
NORTH CAROLINA

CONSTRUCTION PLAN
NORTH WAKE SUBTITLE D LANDFILL FINAL CLOSURE

PROPOSED REGRADE - END-USE PLAN

PROJECT NO. 8172-88782
FILE NAME: FIG. 2.dwg

SHEET NO.
FIG. 2

Section 10
Decommissioning of the Leachate Pond

Included in the Phase 2 Closure of the North Wake Subtitle D Landfill was decommissioning of the lined leachate storage pond, located opposite the northeast corner of the landfill closure on the north side of the concrete perimeter road. The existing leachate pond, approximately 1.25 acres in size, was constructed in 1994-95 along with MSW waste disposal cells 1-4. The pond was constructed using a 60 mil HDPE geomembrane as the base liner, over which a minimum 8-inch thick fabric form concrete pad was constructed to protect the liner. A sump location was constructed at the west end of the leachate pond where liquid leachate was directed to a flowmeter vault for monitoring the daily flow rate before discharging directly to the City of Raleigh sanitary sewer per the City of Raleigh user permit.

HDPE piping from cells 1 and 6 allow for the gravity flow of liquid leachate directly from the landfill leachate collection system to the leachate storage pond with valves to control leachate flow just upgradient of the pond. The flowmeter vault located immediately west of the leachate pond was also the location of the existing leachate sampling station. This area was fenced in and enclosed power transformers, along with a power panel, light pole and sewer manhole for discharge of the liquid leachate directly into the City of Raleigh sanitary sewer. Decommissioning of the leachate pond included removal and relocation of the flowmeter vault and sampling station, along with abandonment of the sanitary sewer manhole and relocation of the power transformers. Soil sampling per the approved decommissioning plan was performed by CDM upon removal of the leachate pond and flowmeter vault and the findings reported to the Solid Waste Section. No leachate contaminated soils were detected.

10.1 Bypass Piping of the Landfill Leachate

Prior to decommissioning the leachate pond, the Contractor was directed to install a leachate bypass pipeline to intercept and divert the discharge of liquid leachate from the landfill past the leachate pond. This was accomplished by excavating and exposing the leachate pipeline just upgradient of the leachate pond in line with cell 1, at which point Thalle Construction utilized the existing valve to shut off the discharge of leachate from the landfill while installing the bypass piping. The same valve was used to control the rate of discharge from the landfill. The leachate piping from the cell 6 outlet was connected directly to the bypass piping between the temporary valve and the discharge point at the sanitary sewer. The bypass piping for discharge of the leachate was directed to the City of Raleigh sanitary sewer manhole located at the existing sampling station. An area velocity flow meter was installed in line with the bypass piping to continue monitoring daily leachate flow rates per the City of Raleigh user permit. Area velocity flow meter data was then provided to the City of Raleigh on a weekly basis to remain in compliance with the user permit. Monthly leachate sampling was performed during the bypass piping of leachate by using a portable

auto sampler. The bypass piping and area velocity flowmeter were maintained during construction until completion of the new sampling station and until a permanent connection of the leachate discharge piping to the City of Raleigh sanitary sewer was completed via a new pipeline alignment east of the leachate pond. The location of the new sampling station and permanent connection of the leachate piping with the City of Raleigh sewer is shown as a record drawing in **Appendix D-1** of this report.

10.2 Demolition of Lined Leachate Storage Pond

Prior to decommissioning of the leachate pond, the Engineer's field representative ensured that all remaining liquid was completely drained from the leachate pond to prevent cross contamination of the soil beneath the pond liner. Decommissioning was scheduled during a forecasted good weather week to prevent any uncontrolled leachate discharge to the underlying soil. Dry soil from the borrow area was mixed with the wet bottom sludge to facilitate hauling the soil/sludge mixture to the landfill closure area. The disposed sludge/soil mixture was covered with a 6-inch thick layer of soil by the end of each workday. Decommissioning was achieved by using a trackhoe with a bucket equipped with ripping teeth. Removal of the fabric form concrete started from the high point at the east end of the leachate pond, without damaging the liner beneath. Removal of the fabric form concrete continued in a westerly direction towards the low end of the leachate pond. After removal of the fabric form concrete the liner was then carefully removed along with 4 to 6 inches of soil or liner subgrade, working in a westerly direction towards the sump location. The fabric form concrete, liner and 4 to 6 inches of soil removed from beneath the liner were all disposed of within the landfill closure area.

10.3 Soil Sampling Beneath the Pond Liner

CDM took soil samples at three arbitrary locations, the middle of the leachate pond labeled S-1, along the side of the leachate pond at midpoint from east to west labeled S-2, and in the sump area at the west end of the pond labeled S-3. These samples were analyzed by SGS Environmental Services, Inc. for evidence of leachate contamination in the pond subgrade. The results are presented in **Appendix A-7** of this report. The results indicate that Arsenic in samples S-2 and S-3, Thallium in sample S-3, and Vanadium in all three samples exceeded their remediation goals when compared to drinking water standards. As a result, a background soil sample was taken in the onsite borrow area at a location upgradient to the landfill and the leachate pond to verify that the analytical results obtained from the soil samples beneath the pond liner are naturally occurring at the site. The results from the background sample indicate that the soils sampled in the borrow area show a similar analytical makeup as the soil samples taken beneath the leachate pond, verifying that the constituents are naturally occurring at the landfill site. As a result of the background sampling, it was established that the subgrade soil beneath the pond liner had not been contaminated with leachate by either leaching or cross contamination. The NCDENR authorized CDM and the Contractor to proceed with backfilling the leachate pond.

10.4 Backfill of the Leachate Pond

The leachate pond was backfilled using common fill from the onsite borrow area. The Engineer's representative was onsite during backfill operations to monitor the suitability of the common fill, as well as the compaction effort. A sheepfoot roller in vibratory mode was used to achieve a compaction of 95% of the standard laboratory proctor value. Terracon performed quality assurance compaction testing to ensure that the minimum 95% compaction requirement was being achieved, along with in place moisture contents within 2-3% wet of optimum.

10.5 Relocation of Leachate Flowmeter Vault and Sampling Station

The new leachate sampling station at the North Wake landfill site was designed by CDM and constructed by Thalle. CDM's field representative was onsite to provide oversight during construction of the new sampling station. The new sampling station consists of a precast manhole equipped with a 4-foot high baffle wall with a metal V-notch weir plate, Hydroranger Plus flowmeter to record leachate flow as the leachate flows through the V-notched weir, an auto sampler for leachate sampling with a permanent sampling tube extending down into the liquid leachate behind the baffle wall and an opening in the side of the manhole for discharge of condensate from the LFG collection system to mix with the leachate behind the baffle wall before being discharged the City of Raleigh sanitary sewer. An opening in the manhole cover was also included to allow leachate samples to be taken from the top of the manhole at anytime. A detail of the sampling station construction is included with this section of the report. In addition, a record drawing of the new sampling station and connection to the City of Raleigh sanitary sewer is presented in Appendix D-1 of this report. At completion of the sampling station CDM programmed and calibrated the flow meter to ensure that accurate flow readings were being obtained. CDM also met with the City of Raleigh to familiarize the City with the new sampling station instrumentation, calibration protocols for the sampling station and current leachate flow rates as recorded by the Hydroranger Plus flowmeter.

10.6 Landfill Gas System Condensate

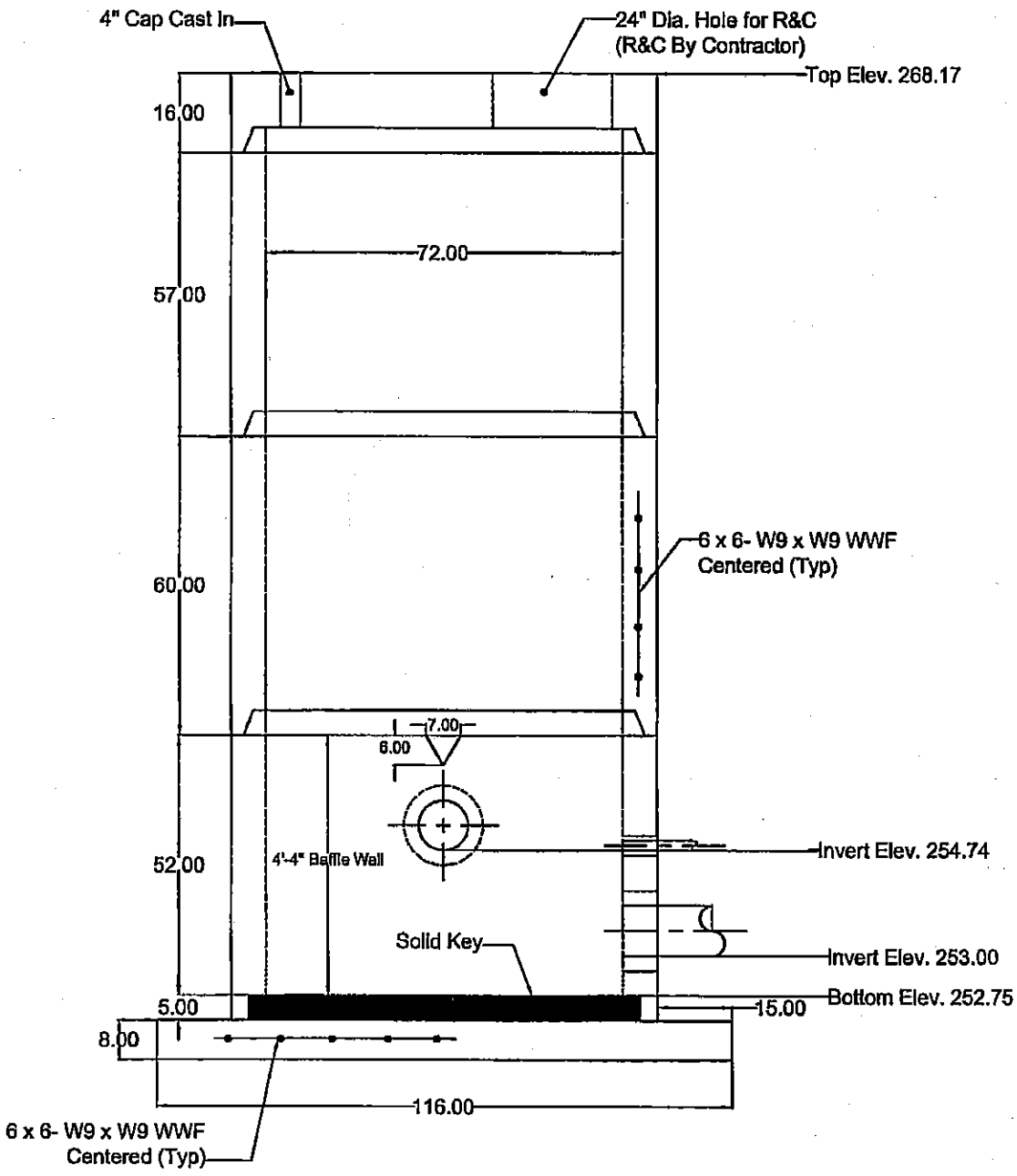
The liquid condensate from the DTE Biomass LFG collection system was discharged directly into the leachate pond prior to decommissioning. All condensate from both the old and new cells, including the landfill closure area was originally collected at a sump location at the entrance to the old cell area and then pumped by force main into the leachate pond. This discharge line was temporarily connected to the bypass piping until the permanent connection to the City of Raleigh sanitary sewer was completed. The condensate discharge line is currently connected to the new sampling station manhole below the baffle wall inside the manhole so as to mix with the leachate from the landfill prior to being discharged to the City of Raleigh sanitary sewer.

Wake County, North Carolina
North Wake Subtitle D Landfill
Phase II Closure Project
Leachate Valves Closing Data

Purpose	Closure Date	Reopening Date	Number of days leachate valves remained closed	Comment
Installation of the leachate by-pass pipeline and the area velocity flow meter	12/12/2008	12/13/2009 for the leachate line coming from the North Sump	1 day	The leachate pipeline from the south sump could not be connected on 12/13/2009 due to lack of material. The location of the line was not as shown on the drawings and additional fittings were required. CDM Field representative monitored the landfill between 12/12/2009 and 12/19/2009 for potential leachate spills and found no issues.
		12/19/2009 for the leachate line coming from the South Sump	7 days	
Decommissioning of the leachate by-pass pipeline and switching to the new leachate sampling station	4/14/2009	4/21/2009	7 days	Field representative monitored the landfill for potential leachate spills. No issues found
Calibration of the new sampling station	6/15/2009	6/15/2009	30 minutes	Field representative monitored the landfill for potential leachate spills. No issues found
Permanent tie-in to the City of Raleigh Flow meter	6/17/2009	6/19/2009	2 days	Field representative monitored the landfill for potential leachate spills. No issues found
Installation of the leachate sampling PVC Pipe and adjustments to the V-notch weir	6/23/2009	6/23/2009	6 hours	Field representative was not onsite. No problem was reported
Second calibration of the new sampling station flow meter	7/27/2009	7/28/2009	1 day	Field representative was not onsite. No problem was reported

520 Pristine Water Dr.
Apex, NC 27502
Ph. (919) 367-3636
Fax (919) 387-8087

Thalle Constr.
Job# 40824
Northern Wake Landfill
Wake Co., NC
Structure: Sampling Station MH



Drawn By: GG

Section

520 Pristine Water Dr.
Apex, NC 27502
Ph. (919) 367-3636
Fax (919) 387-8087

Thalle Constr.
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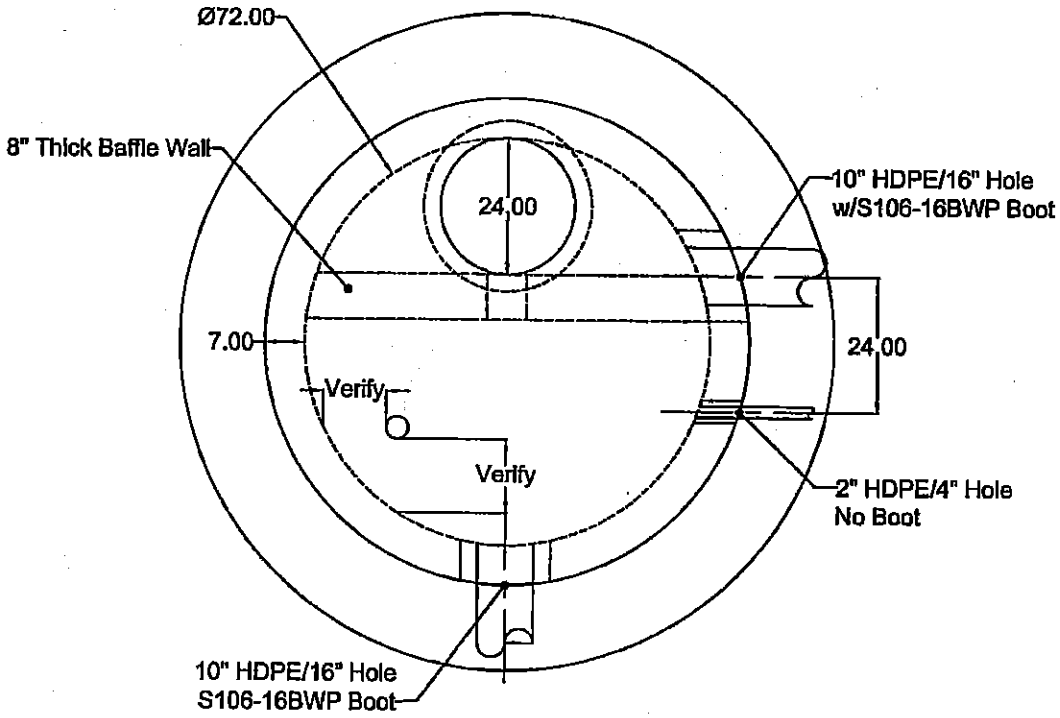
Northern Wake Landfill
Wake Co., NC
Structure: Sampling Station MH



Plan

Drawn By: GG

Section 11
Additional Work for Park Reuse Project

Thalle Construction was directed by Wake County and CDM to perform extra work associated with first phase construction of the North Wake Landfill Park Reuse project, in addition to the North Wake Landfill Phase 2 Closure. This extra work included widening and extending the access road to the top of the landfill closure or crown area, placement of additional cover soil and organics in the crown area for construction by others of a park viewing area, backfill of the park reuse area outside the perimeter road north of the landfill closure and installation of additional erosion control measures approved by Land Quality for the park backfill area. Backfill of the park reuse area also included removal and relocation of the existing flowmeter vault and sampling station along with decommissioning of the leachate pond. Details of this effort will be presented in Section 10 of this report entitled Decommissioning of the Leachate Pond.

11.1 Access Road to Top of Landfill Closure

An 18-foot wide ABC stone access road was constructed from midpoint along the north side of the landfill closure at the perimeter road to the crown of the landfill closure area. This access road is intended for vehicle use by Wake County only and as a pedestrian walkway to access the park viewing area at the top of the landfill closure. The ABC stone access road follows a similar alignment to the access road used during landfill operations, but constructed on top of the landfill closure final cover system. Gabion baskets were installed along the inside edge of the access road as protection for the drainage swale adjacent to the road. The access road was constructed using a 2% grade towards the inside edge of the road to direct stormwater runoff to the gabion reinforced swale. The location of the access road is shown on the Record Drawings presented in Appendix D-1 of this report.

11.2 Crown Area Improvements

Improvements to the crown area consisted of the placement of an additional 24-inches of protective cover soil and 6-inches of organic topsoil in addition to the final cover system of 40 mil LLDPE liner, geocomposite drainage net and 18-inch thick protective soil cover, for a total of 4 feet of cover material within the limits of the park reuse area. The top 6-inch organic topsoil layer replaced the 6-inch vegetative cover material typically placed above the 18-inch protective soil cover layer. The above additional material in the crown reuse area represents minimum additional thicknesses. In some cases, more that the total of 4-feet of cover material was placed to achieve a uniform grade for the crown reuse area, given the crown area grades in relation to the final closure grades. The park reuse area was positioned in the crown area so as to create a relatively uniform thickness of additional material, while at the same time providing separation between the pedestrian accessed viewing area and the vertical LFG collection wells operated by DTE Biomass. The surveyed location of the crown reuse area is shown on the Record Drawings presented in **Appendix D-1** of this report.

Once the additional material was placed, gravel pathways, fencing, mounded landscape areas with plantings and benches were constructed by others within the crown reuse area. The ABC stone access road was then extended to the park viewing area along with the construction of a circular turnaround area immediately adjacent to the west end of the crown viewing area. No designated parking areas were included. The fence posts for the fence line designating the limits of the crown reuse park area were constructed specifically within the additional soil cover layer. The 18-inch thick protective soil cover layer was not disturbed during fence construction or during any other construction activity within the crown reuse area. By constructing mounded landscape areas and placing the additional cover soil on top of the final cover system positive drainage will be maintained for stormwater runoff. It should be noted that no additional protection of the existing vertical LFG collection wells was provided as part of the crown area improvements.

11.3 Backfill of Park Area North of Landfill Closure

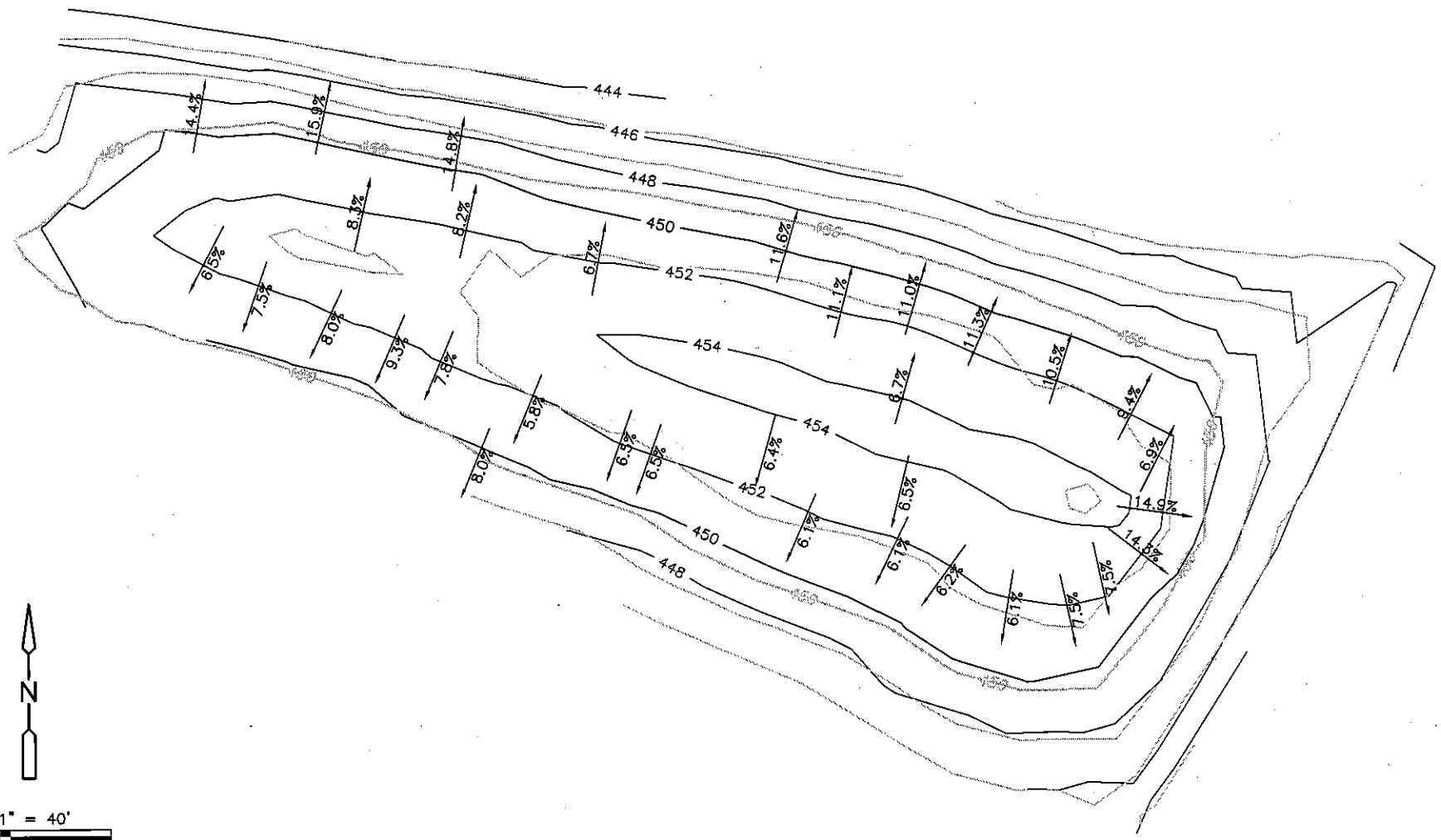
Backfill of the proposed park reuse area immediately west of the former leachate pond was included as extra work under the Phase 2 Closure project, in addition to decommissioning of the leachate pond. This effort included the removal and relocation of the existing leachate sump or flowmeter vault and existing sampling station immediately west of the former leachate pond to a new location between the landfill perimeter road and the former pond location in line with the existing leachate discharge piping from the Subtitle D Landfill. Relocation of the flowmeter vault resulted in additional soil sampling at the flowmeter vault location to confirm that leachate contaminated soil did not exist at this location. No contaminated soil was found. In addition to removal of the flowmeter vault, leachate piping to the vault, the sampling station, existing fencing, lighting and power transformers were also removed prior to backfilling and relocated to the new sampling station location shown on the Record Drawings in Appendix D-1 of this report. Details of the new sampling station installation will be presented in Section 10 of this report.

This additional park reuse area was backfilled using common fill from the onsite borrow area and from a soil stockpile adjacent to the backfill area. The Engineer's representative was onsite during backfill operations to monitor the suitability of the common fill, as well as the compaction effort. A sheepfoot roller in vibratory mode was used to achieve a minimum compaction of 95% of the standard laboratory proctor value (ASTM D-698). Terracon, under contract with Wake County performed quality assurance testing to ensure that the minimum 95% compaction requirement was being achieved, along with in place moisture contents within 2-3% wet of the optimum.

11.4 Additional Erosion Control Measures

Backfill of the additional park reuse area required the design and permitting of additional erosion control measures before backfill could occur. Erosion control measures consisting of sediment basins, rip rap channels, silt fence, rock dams and a level spreader at the stormwater discharge outlet were prepared by CDM and constructed by Thalle Construction in accordance with the erosion control permit

approved by NCDENR Land Quality. Stormwater discharge from sediment basin #3, west of the park reuse backfill area, was rerouted via a new rip rap channel to the nearby stream as a temporary measure until a final plunge pool installation was constructed as part of the Park Reuse project.



CDM Camp Dresser & McKee

DATE _____

FIGURE NO.

NOT FOR CONSTRUCTION

APPENDIX A-1

Daily and Weekly Summary Reports

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 06-28-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary: _____

Contractor: Thalle Construction

Major Deliveries: _____

Work Performed:

- Notice to proceed was issued on June 25, 2008
- Preconstruction video was completed on June 27, 2008 by Fred Morin (Thalle)

Project Representative: Fred Morin Date: 06/28/2008

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 07-05-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary:

Contractor: Thalle Construction

Major Deliveries:

Work Performed:

- Contractor started mobilization.

Project Representative: Gabrielle Bowman Date: 07/05/2008

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 07-12-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary: N/A

Contractor: Thalle Construction

Major Deliveries:

Work Performed:

- Contractor continued mobilization.

Project Representative: [signature] Date: 07/12/2008

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 07-19-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary: Mostly clear and sunny

Contractor: Thalle Construction

Major Deliveries: Riprap for erosion control

Work Performed:

- Contractor installed silt fence in the borrow area and started stripping vegetation for the sediment ponds.
- Karen Pageau (NCDENR- Land Quality Section) performed a site visit on Thursday July 17, 2008 following approval of the Erosion & Sedimentation Control Plan.

Project Representative: Ed Thalle Brenner Date: 07/19/2008

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 07-26-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary: Mostly sunny and clear.

Contractor: Thalle Construction

Major Deliveries:

Work Performed:

- Contractor continued installing sediment ponds No. 1 and 2, check dams and the diversion berm in the borrow area.
- Contractor installed skimmer dewatering devices and riser barrels at the outlet of sediment ponds No. 1 and 2.
- Contractor started screening of soil in the borrow area.

Project Representative: Gabrielle Bonner Date: 07/26/2008

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 8-02-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary: Mostly sunny and clear

Contractor: Thalle Construction

Major Deliveries: _____

Work Performed:

- Contractor installed riprap lined emergency spillway with fabric underneath for each stormwater pond in the borrow area.
- Contractor installed grass lined channel, sediment trap, riprap lined channel in the borrow area.
- Contractor continued screening soil in the borrow area
- Contractor started stripping vegetation, removing leaves and placing additional intermediate cover on the east slope.
- The County has authorized the use of water from Sandtek shop to solve dust control problem.

Project Representative: _____ Date: 08/02/2008

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 8-09-2008

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

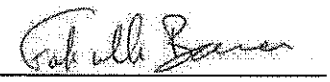
Weather Summary:

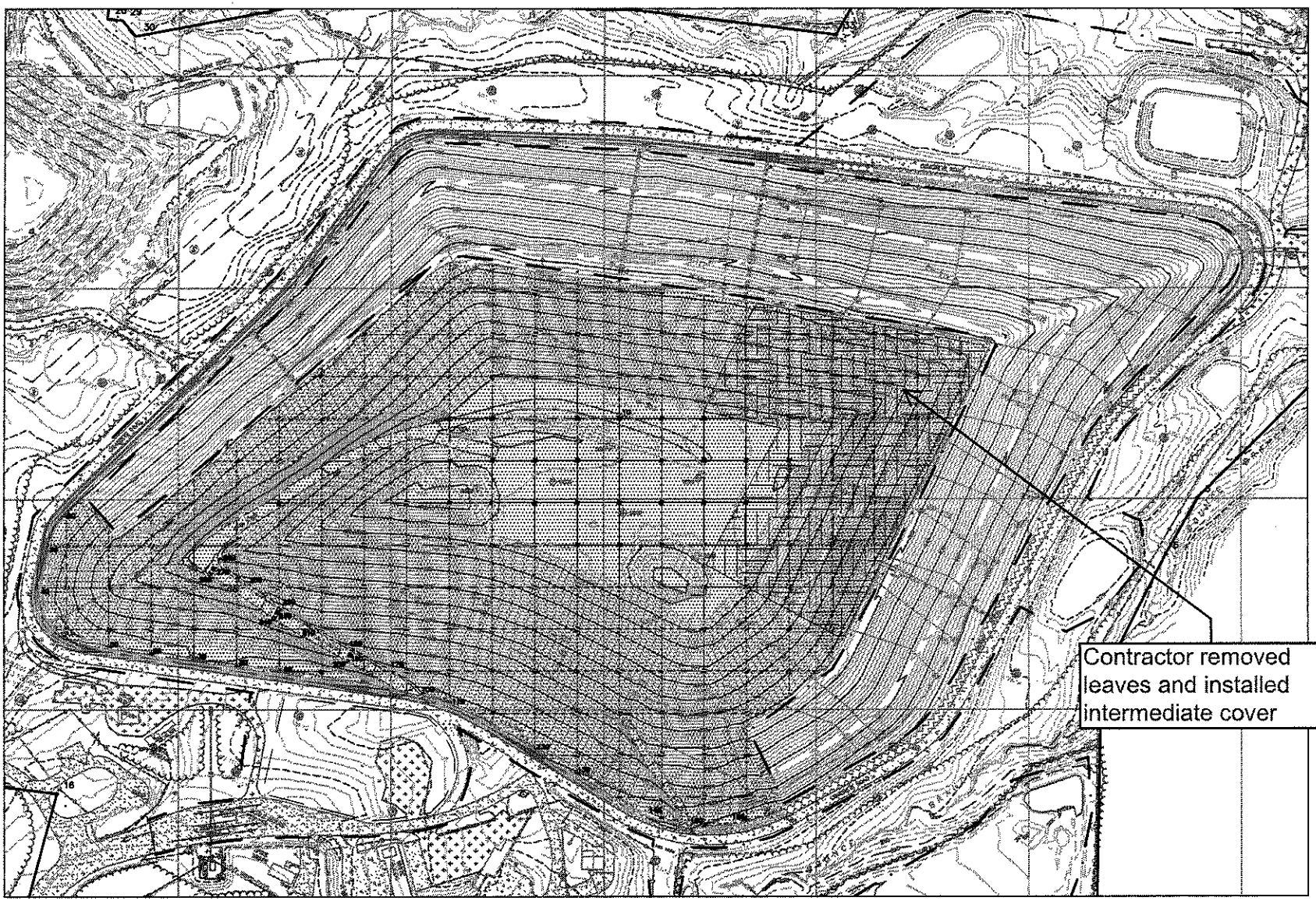
Contractor: Thalle Construction

Major Deliveries:

Work Performed:

- Contractor continued screening of soil in the borrow area
- Contractor stripped vegetation, removed leaves and placed additional intermediate cover on the east and north slopes
- Terracon performed test pad on the protective cover on Friday August 08, 2008.

Project Representative:  Date: 08/09/2008


Contractor removed leaves and installed intermediate cover

CDM

CDM

DAILY PROGRESS REPORT

Date: Monday 8/11/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 90 Lo Temp 70

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 15 (Thalle)

Equipment: See separate list of equipment

Deliveries: LLDPE Liner Rolls

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle stripped vegetation and removed leaves from the north slope
- Hallaton arrived on-site and started making sand bags
- Thalle uncovered soil from Phase 1 and 2 tie-in area

Gas wells 109, 107, 215, 202, 301, 302, 310, and 311 were disconnected to begin liner installation and to continue with subgrade installation

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

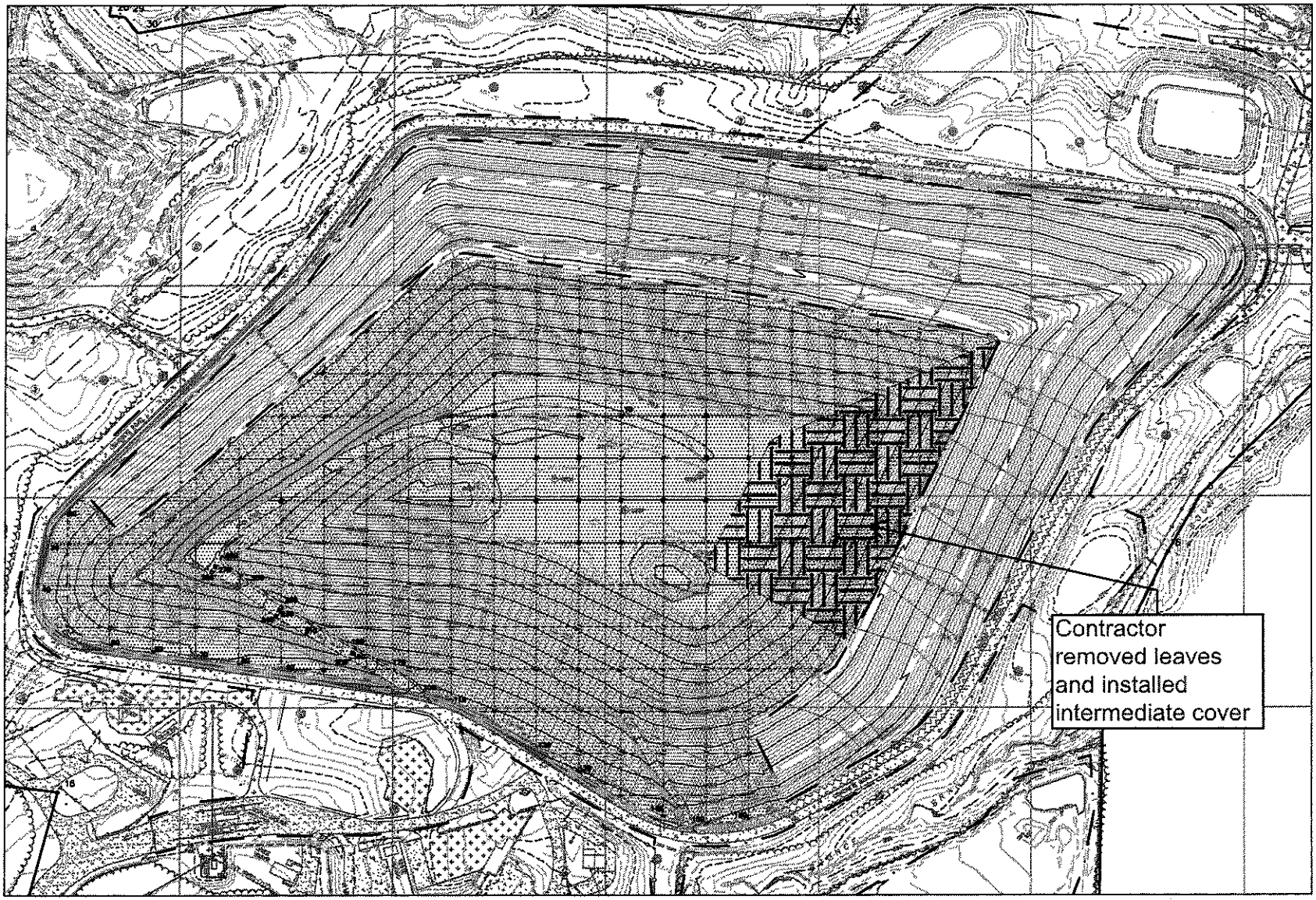
DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/11/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**


Contractor
removed leaves
and installed
intermediate cover

CDM

CDM

DAILY PROGRESS REPORT

Date: Tuesday 8/12/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 87 Lo Temp 68

Clear X Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors:

Workforce/manpower: 15 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: LLDPE Liner Rolls

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle stripped vegetation and removed leaves from the North Slope
- Thalle uncovered soil from Phase 1 and 2 tie-in area
- Liner pre-installation meeting was held between CDM, Wake County, Hallaton and Thalle

8 gas wells disconnected yesterday are still offline

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/12/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 8/13/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 87 Lo Temp 68

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: LLDPE Liner Rolls

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle stripped vegetation and installed intermediate cover on the North Slope
- Hallaton installed 1.25 acres of LLDPE liner on the East Slope

Gas wells 107 and 109 were reconnected. As of today, 6 gas wells are still offline

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/13/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Thursday 8/14/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 88 Lo Temp 64

Clear _____ Partly Cloudy X Precipitation 0.1 after 03:00 PM

Contractor: Thalle Construction

Hours Worked: 9.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle continued stripping vegetation and installed intermediate cover on the North Slope and uncovered phase 1 and 2 tie-in liner
- Hallaton installed LLDPE liner on the East Slope

Wells 302 and 310 were reconnected. As of today, 4 wells are offline

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/14/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 15

CDM

DAILY PROGRESS REPORT

Date: Friday 8/15/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 90 Lo Temp 69

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area

- Thalle stripped vegetation, installed intermediate cover on the North Slope and uncovered phase 1 and 2 tie-in liner

- Hallaton performed repairs on the liner installed on Thursday and installed 0.5 acre of composite drainage net

4 gas wells are still offline

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 8/15/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 15

CDM

DAILY PROGRESS REPORT

Date: Saturday 8/16/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 90 Lo Temp 69

Clear X Partly Cloudy ____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: ____

Workforce/manpower: 2 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: ____

Defective work/deficiencies noted today to be corrected later: ____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): ____

- Hallaton installed 2 acres of LLDPE liner on the east slope and on a small portion of the north Slope

4 gas wells are still offline

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

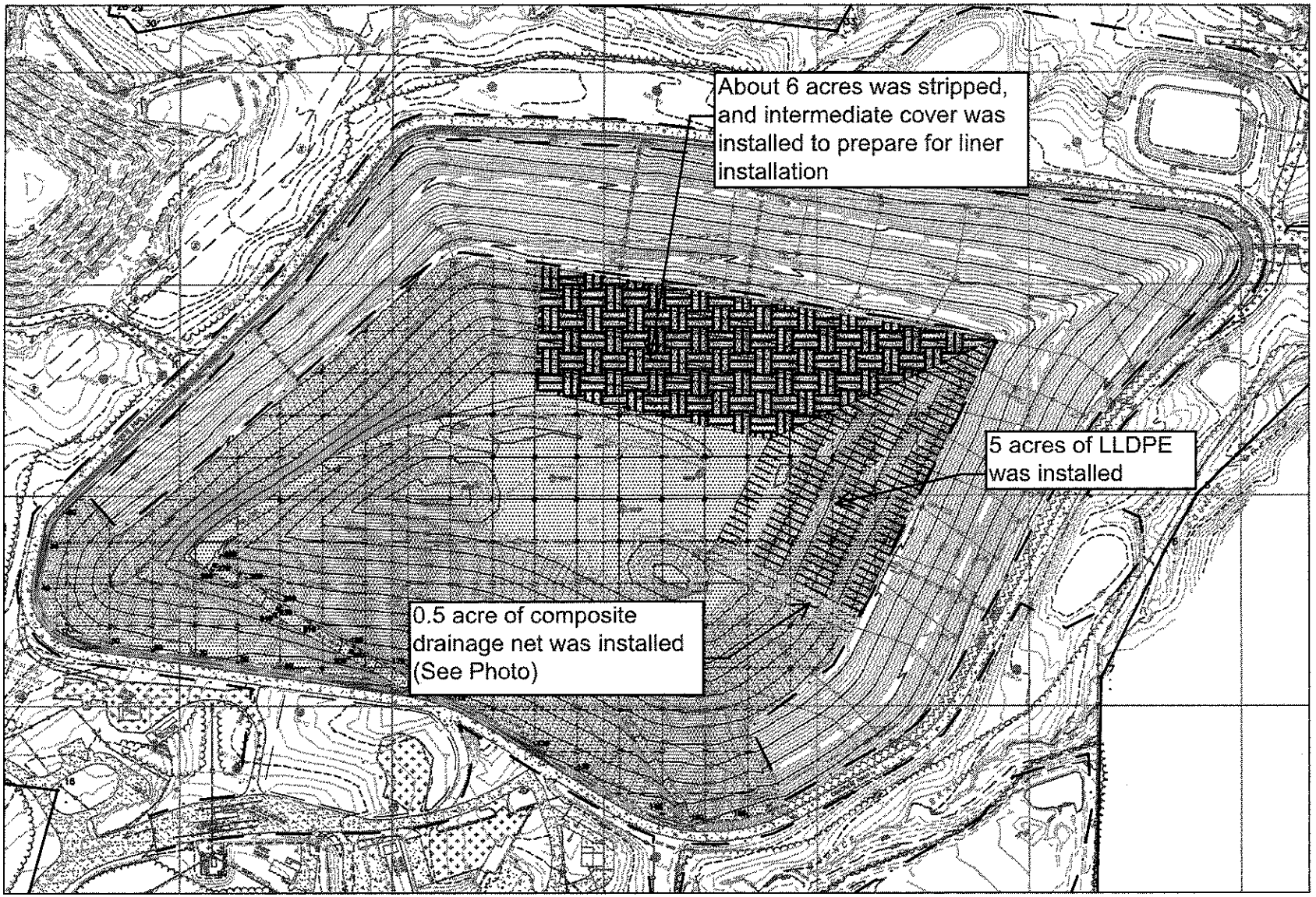
DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/16/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	1
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **11**


About 6 acres was stripped, and intermediate cover was installed to prepare for liner installation
5 acres of LLDPE was installed
0.5 acre of composite drainage net was installed (See Photo)

CDM

CDM

DAILY PROGRESS REPORT

Date: Monday 8/18/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 90 Lo Temp 64

Clear X Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors:

Workforce/manpower: 14 (Thalle) 12 (Hallaton)

Equipment: See separate list of equipment

Deliveries: Composite Drainage Net

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle installed 18-inch protective cover on top of the composite drainage net on the East Slope.
- Hallaton continued with composite drainage net on top of the LLDPE liner on the East Slope
- Thalle uncovered soil from Phase 1 and 2 tie-in area

- Gas wells 202, and 301 on the North Slope were reconnected. Currently, two wells are offline (215 and 311).

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/18/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 8/19/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 96 Lo Temp 65

Clear X Partly Cloudy ____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: ____

Workforce/manpower: 19 (Thalle) 12 (Hallaton)

Equipment: See separate list of equipment

Deliveries: ____

Defective work/deficiencies noted today to be corrected later: ____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): ____

- Thalle processed soil in the borrow area
- Thalle continued with 18-inch cover on the East Slope
- Hallaton installed LLDPE liner on the North Slope
- Hallaton installed composite drainage net on the East Slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/19/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 8/20/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 91 Lo Temp 68

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 16 (Thalle) 12 (Hallaton)

Equipment: See separate list of equipment

Deliveries: Composite Drainage Net Rolls

Defective work/deficiencies noted today to be corrected later: A Gas bubble occurred underneath the liner on the East Slope. Contractor was instructed to perform a cut to let the gas out. Hallaton will perform the repair and record in the CQA documents

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle continued with 18-inch cover on the East Slope
- Hallaton installed composite drainage net on the East Slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 8/20/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Thursday 8/121/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 92 Lo Temp 66

Clear X Partly Cloudy _____ Precipitation 0.1 after 03:00 PM

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Hallaton continued installation of composite drainage net on the East and North Slopes
- Thalle removed approximately 0.5 acre of leaved on the west slope
- Contractor uncovered liner for phase 1 and phase 2 tie-in on the WestSlope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 8/21/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Friday 8/22/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 95 Lo Temp 68

Clear X Partly Cloudy ____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9.5 ; from 07:00 am to 05:30 pm

Visitors: ____

Workforce/manpower: 20 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: HDPE downdrains

Defective work/deficiencies noted today to be corrected later: ____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): ____

- Thalle processed soil in the borrow area
- Thalle continued with protective cover on the east slope.
- Hallaton installed liner on the North Slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/22/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Saturday 8/23/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 92 Lo Temp 68

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 2 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Hallaton installed composite drainage net on the North Slope
- Four wells were disconnected for composite drainage net installation, and they were all reconnected at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 8/23/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	1
Excavators	PC300/CAT	
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	1
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **10**

CDM

DAILY PROGRESS REPORT

Date: Monday 8/25/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 14 (Thalle) 12 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area.

- Hallaton continued with composite drainage net on top of the LLDPE liner on the North Slope.

- Thalle started installation of 18-inch protective cover on the composite drainage net. Installation and compaction were performed in 8-inch lifts using a D-6 compactor as specified for this project. RPR verified visually the quality of the soil and the compaction process.

- Thalle started installation of HDPE downdrains on the East Slope

Two wells were disconnected during the day and were put back on line at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/25/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 8/26/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy Precipitation 0.25-inch

Contractor: Thalle Construction

Hours Worked: 5 ; from 07:00 am to 12:00 pm

Visitors:

Workforce/manpower: 19 (Thalle) 12 (Hallaton)

Equipment: See separate list of equipment

Deliveries: Downdrains

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle continued with 18-inch cover on the East Slope
- Hallaton installed composite drainage net on the North Slope
- Thalle continued with HDPE downdrains on the north slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 8/26/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 8/27/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 71

Clear _____ Partly Cloudy _____ Precipitation 3.5-inch

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

_____

_____

NO WORK DUE TO WEATHER CONDITIONS

_____

_____

_____

_____

_____

_____

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 8/28/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation 0.23-inch

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

_____

_____

NO WORK DUE TO WEATHER CONDITIONS

_____

_____

_____

_____

_____

_____

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 8/29/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 89 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation 0.23-inch

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to ___

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

_____

_____

NO WORK DUE TO WEATHER CONDITIONS

_____

_____

_____

_____

_____

_____

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Saturday 8/30/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 92 Lo Temp 68

Clear X Partly Cloudy ____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: ____

Workforce/manpower: 2 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: ____

Defective work/deficiencies noted today to be corrected later: ____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): ____

- Thalle processed soil in the borrow area
- Hallaton installed composite drainage net on the North Slope
- Four wells were disconnected for composite drainage net installation, and they were all reconnected at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 8/30/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	
Excavators	PC300/CAT	2
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	1
Screeners		1
Cars		
Compactor	Smooth drum	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **10**

CDM

DAILY PROGRESS REPORT

Date: Monday 9/01/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 75 Lo Temp 65

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: Thalle (12)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle started rough grading the new access road
- RPR and Surveyor checked the thickness of the intermediate cover. To ensure that a minimum of 12 –inch of cover was provided for the liner.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/1/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 9/02/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 75_ Lo Temp 65

Clear X Partly Cloudy Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors:

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle continued rough grading for the new access road
- Thalle started installation of the 6-inch vegetative cover on top of the 18-inch protective cover and started building the sideslope diversion berms on the East Slope.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/2/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 9/03/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 74 Lo Temp 65

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle continued grading of the new access road
- Hallaton installed composite drainage net on the East Slope
- Thalle started installation of the 6-inch vegetative cover on top of the 18-inch protective cover and started building the sideslope diversion berms on the East Slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/3/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Thursday 9/04/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 55

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle continued grading of the new access road
- Hallaton installed LLDPE liner on the North Slope
- Thalle started performing temporary repairs on the erosion control features in preparation of Tropical Storm Hanna

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/4/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Friday 9/05/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 63

Clear _____ Partly Cloudy X Precipitation 0.5

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: Contractor performed temporary repair to the sediment pond outlet structures. This is a temporary mean in preparation for the Tropical Storm Hanna. Permanent repair will be performed next week

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle continued grading of the new access road
- Thalle started performing temporary repairs on the Erosion control features in preparation of Tropical Storm Hanna

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 9/5/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Monday 9/08/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued placement of fill material on the new access road.
- Thalle performed an after tropical storm Hanna cleanup of the work site
- A joint site visit was performed by CDM, Thalle and North Wake to assess damages from Tropical Storm Hanna
- Two wells were disconnected during the day and were put back on line at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/8/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 9/09/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 78 Lo Temp 70

Clear X Partly Cloudy ____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: ____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: 7 cu yds of concrete for Sediment pond # 2 skimmer base

Defective work/deficiencies noted today to be corrected later: ____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): ____

- Thalle processed soil in the borrow area
- Thalle continued rough grading for the new access road
- Thalle started installation uncovering protective cover on the east slope for the liner flaps
- Thalle performed repair on Sediment pond # 2 outlet structure by constructing a 7 cubic yards concrete base

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 9/9/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 9/10/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 71 Lo Temp 67

Clear X Partly Cloudy Precipitation 1-inch

Contractor: Thalle Construction

Hours Worked: 3 ; from 07:00 am to 10:00 am

Visitors:

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle started rough grading for the new access road
- Contractor stopped all work at 10:00 AM due to weather conditions

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/10/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Thursday 9/11/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 67

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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NO WORK DUE TO WEATHER CONDITIONS

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 9/12/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 77 Lo Temp 70

Clear _____ Partly Cloudy _____ Precipitation_____

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment:_____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later:_____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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NO WORK DUE TO WEATHER CONDITIONS

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 9/15/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear _____ Partly Cloudy ___X_____ Precipitation 0_____

Contractor: Thalle Construction

Hours Worked: __12__; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle) 12 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area.
- Thalle continued grading the new access road
- Thalle continued uncovering the protective cover on the East Slope for liner flaps

Three wells were disconnected during the day and were put back on line at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/15/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 9/16/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy____ Precipitation 1.38-inch

Contractor: Thalle Construction

Hours Worked: 5 ; from 07:00 am to 10:00 am

Visitors:

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: Downdrains

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- CDM and Thalle took samples in the borrow area to be tested by Geotechnics
- Work was suspended at 10:00 am due to weather conditions.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/16/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 9/17/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 71

Clear _____ Partly Cloudy _____ Precipitation 3.5-inch

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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NO WORK DUE TO WEATHER CONDITIONS

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 9/18/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08 am to 05

Visitors: _____

Workforce/manpower: 10 (Thalle)

Equipment: See Separate list

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened material in the borrow area
- Thalle placed protective cover on the North Slope
- Thalle continued rough grading of the access road

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/18/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Friday 9/19/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 08 ; from 08 am to 05 pm

Visitors: _____

Workforce/manpower: 12 (Thalle)

Equipment: _____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened material in the borrow area
- Thalle placed protective cover on the North Slope
- Thalle continued rough grading of the access road

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/19/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Monday 9/22/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: it was noticed that the intermediate cover was too wet 1 ft below surface. Thalle was instructed to expose the subgrade and let it dry, then compact again

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area.
- Thalle performed permanent repairs on Sediment Pond # 1 by constructing a concrete base for the riser barrel.
- Thalle continued installation of 18-inch protective cover on the North Slope
- Terracon performed test pad on the road subgrade. The subgrade was too wet due to accumulation of rain over the past weeks. Thalle was instructed to expose the bottom of the subgrade and let it dry.
- Three wells were disconnected during the day and were put back on line at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/22/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 9/23/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- Thalle processed soil in the borrow area
- Thalle placed and compacted fill material for the new access road subgrade
- Thalle started with the first set of downdrains on the North Slope
- Thalle constructed a patch of soil on the south slope to cover the methane exceedance noticed after SCS's sweeps.

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/23/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 9/24/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 71

Clear _____ Partly Cloudy _____ Precipitation 3.5-inch

Contractor: Thalle Construction

Hours Worked: 0 ; from am to

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: A gas bubble occurred on the North Slope. Two cuts were performed on the liner to let the gas out. Hallaton to repair and record there repairs for CQA documents later.

_____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- Thalle continued processing soil in the borrow area.
- Thalle continued placing 18-inch protective cover on the North Slope.
- Power outage occurred at the Wake Gas Producers plant. The gas collection system was down from 03:00 am to 03:00 pm. The outage was due to a break in the power line.

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/24/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Thursday 9/25/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation 0.23-inch

Contractor: Thalle Construction

Hours Worked: 7 ; from 07:00 am to 11:00 am

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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Work was suspended at 11:00 am due to rainfall

Prior to the rain, Thalle installed protective cover on the North Slope

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/25/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **15**

CDM

DAILY PROGRESS REPORT

Date: Friday 9/26/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 89 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation_____

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment:_____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later:_____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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NO WORK DUE TO WEATHER CONDITIONS

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 9/29/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle placed vegetative cover on the North Slope

Four gas wells were disconnected for vegetative cover installation.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/29/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 9/30/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy Precipitation

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors:

Workforce/manpower: 25 (Thalle) 10 (Hallaton)

Equipment:

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle placed vegetative cover on the North Slope
- Hallaton installed liner flaps on the East Slope

Three gas wells were disconnected for vegetative cover installation.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 9/30/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 17

CDM

DAILY PROGRESS REPORT

Date: Wednesday 10/01/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 67

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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NO WORK DUE TO WEATHER CONDITIONS

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 10/02/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy Precipitation

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors:

Workforce/manpower: 25 (Thalle) 10 (Hallaton)

Equipment:

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area
- Thalle placed vegetative cover on the North Slope
- Hallaton installed liner flaps on the East Slope

Three gas wells were disconnected for vegetative cover installation.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/2/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/06/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear X Partly Cloudy Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors:

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later: it was noticed that the intermediate cover was too wet 1 ft below surface. Thalle was instructed to expose the subgrade and let it dry, then compact again

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle processed soil in the borrow area.
- Thalle performed permanent repairs on Sediment Pond # 1 by constructing a concrete base for the riser barrel.
- Thalle continued installation of 18-inch protective cover on the North Slope
- Terracon performed test pad on the road subgrade. The subgrade was too wet due to accumulation of rain over the past weeks. Thalle was instructed to expose the bottom of the subgrade and let it dry.
- Three wells were disconnected during the day and were put back on line at the end of the day.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/6/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 10/07/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- Thalle processed soil in the borrow area
- Thalle placed and compacted fill material for the new access road subgrade
- Thalle started with the first set of downdrains on the North Slope
- Thalle constructed a patch of soil on the south slope to cover the methane exceedance noticed after SCS's sweeps.

_____

_____

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/7/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 10/08/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 71

Clear _____ Partly Cloudy _____ Precipitation 3.5-inch

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment: _____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: A gas bubble occurred on the North Slope. Two cuts were performed on the liner to let the gas out. Hallaton to repair and record there repairs for CQA documents later.

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued processing soil in the borrow area.
- Thalle continued placing 18-inch protective cover on the North Slope.
- Power outage occurred at the Wake Gas Producers plant. The gas collection system was down from 03:00 am to 03:00 pm. The outage was due to a break in the power line.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/8/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 10/09/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation 0.23-inch

Contractor: Thalle Construction

Hours Worked: 7 ; from 07:00 am to 11:00 am

Visitors: _____

Workforce/manpower: _____

Equipment: _____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Work was suspended at 11:00 am due to rainfall

Prior to the rain, Thalle installed protective cover on the North Slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/9/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Friday 10/10/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 89 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation_____

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to _____

Visitors: _____

Workforce/manpower: _____

Equipment:_____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later:_____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

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_____

NO WORK DUE TO WEATHER CONDITIONS

_____

_____

_____

_____

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_____

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 10/13/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 68

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area.
- Thalle continued installation of 18-inch protective cover on the West Slope
- Hallaton installed Composite drainage net on top of the LLDPE liner on the West Slope
- Three wells were disconnected during the day. Two were reconnected at the end of the day.
- Due to Mallinckrodt outage from October 13 to October 22, 2008. The temporary flare station brought in by WGPs to burn excess of gas has not been permitted by the State. The probability of gas bubbles buildup will be higher overnight. RPR will be on site early on Tuesday to monitor the gas bubbles buildup.

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/13/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 17

CDM

DAILY PROGRESS REPORT

Date: Tuesday 10/14/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 83 Lo Temp 66

Clear X Partly Cloudy____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle) 10 (Hallaton)

Equipment: See separate list for equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area for protective cover
- Thalle placed protective cover material on the east slope
- Thalle prepared the southwest portion for liner placement
-Hallaton installed rain flaps on the North Slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/14/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 10/15/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 71

Clear _____ Partly Cloudy _____ Precipitation 3.5-inch

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 10 (Hallaton) 25 (Thalle)

Equipment: See separate list

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued processing soil in the borrow area.
- Thalle continued placing 18-inch protective cover on the West Slope.
- Thalle started removing leaves and stripping vegetation on the south slope (stage 2 area)
- Hallaton installed LLDPE liner on the southwest corner of the landfill
- Approval; from the State for the temporary flare station was obtained today and the flare was turned on by Wake gas Producers. .

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/15/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 10/16/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 84 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 12 ; from 07:00 am to 07:00 pm

Visitors: _____

Workforce/manpower: 10 Hallaton, 25 (Thalle)

Equipment: See separate list

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed soil in the borrow area
- Thalle continued protective cover on the west slope
- Thalle continued stripping and leaves removal on the south slope (Phase 2)
- Hallaton performed repairs on the southwest corner
- Hallaton installed composite drainage net on the west slope

Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 10/16/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Friday 10/17/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 89 Lo Temp 73

Clear _____ Partly Cloudy _____ Precipitation_____

Contractor: Thalle Construction

Hours Worked: 0 ; from am to

Visitors: _____

Workforce/manpower: _____

Equipment:_____

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later:_____

_____

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Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

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NO WORK DUE TO WEATHER CONDITIONS

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Project Representative: Farouk Mollah Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/17/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 17

CDM

DAILY PROGRESS REPORT

Date: Monday 10/20/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 67 Lo Temp 35

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued grading of the northwest slope.
- Thalle filled the bottom of southwest slope to cover liner flaps and drainage trench.
- Hallaton left site

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 10/20/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **16**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/21/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 74 Lo Temp 42

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued laying cover on northwest slope and began stripping front south slope.
- Thalle continued filling bottom of southwest slope to cover liner flaps and drainage trench.
- Thalle began seeding top layer of cover on northeast slope.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 10/21/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/23/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 60 Lo Temp 39

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued laying cover on northwest slope and continued stripping front southeast slope.
- Thalle continued filling bottom of southwest slope to cover liner flaps and drainage trench.
- Thalle began seeding top layer of cover on north slope.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 10/23/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/24/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 48

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued laying cover on northwest slope and continued stripping front southeast slope.
- Thalle continued filling bottom of southwest slope to cover liner flaps and drainage trench and began digging and filling south edge of slope.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/24/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **16**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/27/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 34

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened soil in the borrow area
- Thalle continued placing protective cover on the southwest slope
- Thalle continued excavating the western portion of the North Slope berms for liner flaps.
- Thalle buried the 12-inch header on the southeast slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/27/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/28/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 74 Lo Temp 42

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- Thalle processed protective cover soil in the borrow area
- Thalle installed protective cover on the southwest corner
- Thalle uncovered protective cover on the North Slope for rain flaps installation
- Thalle continued building sideslope diversion berms on the west slope.

_____

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/28/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 10/29/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 34

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) and 4 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle processed vegetative cover soil in the borrow area
- Thalle installed vegetative cover on the west slope
- Thalle continued installing HDPE downdrains on west slope .
- Hallaton started liner flaps on the southwest corner.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/29/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Monday 10/30/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 48

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued laying cover on northwest slope and continued stripping front southeast slope.

- Thalle continued filling bottom of southwest slope to cover liner flaps and drainage trench and began digging and filling south edge of slope.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/30/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Friday 10/31/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 54 Lo Temp 48

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- Thalle prepared vegetative cover in the borrow area
- Thalle continued placing vegetative cover on the west slope and at the southwest corner
- Thalle continued excavating the western portion of the North Slope berms for liner flaps.
- Hallaton installed rain flaps on the north slope and on the west slope

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Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 10/31/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **16**

CDM

DAILY PROGRESS REPORT

Date: Saturday 11/01/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 48

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 04:00 pm

Visitors: _____

Workforce/manpower: 10 (Thalle) 4 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Thalle continued placing vegetative cover on the west slope and at the southwest corner
- Thalle continued excavating the western portion of the North Slope berms for liner flaps.
- Hallaton continued rain flaps on the western half of the north slope and on the west slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 11/1/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **16**

CDM

DAILY PROGRESS REPORT

Date: Monday 11/03/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 54

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) 8 (Hallaton)

Equipment: See separate list of equipment

Deliveries: GCL rolls

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Thalle continued placing vegetative cover on the west slope and at the southwest corner
- Thalle continued excavating the western portion of the North Slope berms for liner flaps.
- Thalle rolled the south slope for liner installation
- Hallaton continued rain flaps on the western half of the north slope and on the west slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/3/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 11/04/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 74 Lo Temp 42

Clear _____ Partly Cloudy _____ Precipitation 0.13

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

_____

_____

NO WORK DUE TO WEATHER CONDITIONS

_____

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_____

_____

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Wednesday 11/05/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 34

Clear _____ Partly Cloudy _____ Precipitation 1 inch

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) and 4 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

NO WORK DUE TO WEATHER CONDITIONS

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 11/06/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 76 Lo Temp 47

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle mixed vegetative cover material soil in the borrow area
- Thalle continued with vegetative cover installation on the west slope
- Thalle continued construction of stormwater diversion berms on the west slope
- Hallaton installed LLDPE liner on the southeast slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/6/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	3
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Friday 11/07/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 70 Lo Temp 48

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened protective cover soil in the borrow area and prepared vegetative cover
- Thalle continued uncovering protective cover on the west slope for rain flaps installation
- Thalle started removing leaves and stripped vegetation on the western portion of the south slope. It was noticed that the existing intermediate cover does not have a consistent thickness. Waste was uncovered at many locations after removal of leaves or stripping of the vegetation. Therefore, more than 3 inches of intermediate cover soil will be required to meet the minimum 12-inch thickness of the vegetative cover.
- Thalle installed GCL at the eastern portion of the south slope tie-in.
- Hallaton continued LLDPE liner on the eastern half of the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/7/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	1
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		1
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **16**

CDM

DAILY PROGRESS REPORT

Date: Saturday 11/08/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 70 Lo Temp 43

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened protective cover soil in the borrow area and prepared vegetative cover
- Hallaton installed rain flaps on the west slope
- Hallaton performed air test and repairs on LLDPE installed on the south slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/8/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	1
Excavators	PC300/CAT	1
D6 Dozers	CAT	1
D7 Dozers	CAT	
Grader	CAT	1
Dump Trucks	Cat/Volvo	
ATVs	Kubota	
Screeners		
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 6

CDM

DAILY PROGRESS REPORT

Date: Monday 11/10/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Thalle installed gravel for the rain flaps on the west slope
- Thalle continued removal of leaves and grass on the western portion of the south slope

It was noticed that the thickness of the intermediate cover underneath the leaves is not consistent as garbage was uncovered at some locations right after removal of vegetative cover.

- Hallaton performed repairs and destructive sample on the liner installed on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/10/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 11/11/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- Thalle screened soil in the borrow area.
- Thalle buried the header pipe on the south slope and removed leaves and topsoil.
- Thalle placed intermediate cover on the south slope. It was noticed that since the thickness of the intermediate cover is less than 9 inches and the slope is not flat after removal of leaves, more than 3 inches of soil will be required to maintain the minimum 12 inches of intermediate cover , and get a smooth surface for liner placement.
- Hallaton installed composite drainage net on the LLDPE liner on the south slope.

_____

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/11/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 11/12/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened protective cover soil in the borrow area and prepared vegetative cover.
- Thalle installed vegetative cover on the west slope.
- Hallaton started liner flaps on the bottom of the south slope.
- Hallaton installed composite drainage net on the south slope and at the southeast corner.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/12/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Thursday 11/13/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 56

Clear _____ Partly Cloudy _____ Precipitation 0.5 inch

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) and 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened protective cover soil in the borrow area.
- Hallaton started liner flaps on the bottom of the south slope.
- Hallaton installed composite drainage net on the south slope and at the southeast corner.
- Thalle performed temporary seeding of western half of the North Slope and the west slope.
- Work was suspended after 12:00 pm due to rainfall.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/13/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 11/14/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 64 Lo Temp 55

Clear _____ Partly Cloudy _____ Precipitation 0.81

Contractor: Thalle Construction

Hours Worked: 0 ; from _____

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

No Work due to weather conditions

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Saturday 11/15/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 76 Lo Temp 51

Clear _____ Partly Cloudy _____ Precipitation 0.62

Contractor: Thalle Construction

Hours Worked: 0 ; from _____

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

No Work due to weather conditions

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 11/17/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle rolled the second 5 acre area on the south slope for liner placement
- Hallaton finished composite drainage net installation on the south slope
- Thalle excavated for the downdrain on the south slope and hauled waste to the top of the landfill
- Thalle performed cleanup of the south slope tie-in trenches filled with water as result of last week's rainfall.
- Thalle notified Engineer that the second half of Stage 1 is now seeded and ready for Wake Gas Producers to perform their permanent gas collection installation.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/17/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 11/18/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened soil in the borrow area.
- Hallaton installed LLDPE liner on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/18/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 11/19/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened protective cover soil in the borrow area and prepared vegetative cover.
- Thalle installed vegetative cover on the west slope.
- Hallaton installed liner on the south slope.
- Hallaton installed composite drainage net on the south slope and at the southeast corner.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/19/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Thursday 11/20/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 56

Clear _____ Partly Cloudy _____ Precipitation 0.5 inch

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 15 (Thalle) and 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle screened protective cover soil in the borrow area.
- Hallaton started liner flaps on the bottom of the south slope.
- Hallaton installed composite drainage net on the south slope and at the southeast corner.
- Thalle performed temporary seeding of western half of the North Slope and the west slope.
- Work was suspended after 12:00 pm due to rainfall.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/20/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 11/21/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 76 Lo Temp 47

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle mixed vegetative cover material soil in the borrow area
- Hallaton installed Composite drainage net on the south slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/21/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Monday 11/24/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Hallaton placed protective cover on the composite drainage net
- Strong odors were noticed and liner bubbles appeared on the south slope. It was noticed that the flare was off and WGPs were contacted and the flare was started. WGPs explained that their gas client was using all the gas collected.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/24/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 11/25/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Hallaton placed protective cover on the composite drainage net
- Buildup of gas bubbles underneath the liner continued. Hallaton performed two cuts to let the gas out. These holes were repaired. It was noticed later that a valve on one of the pipes that supply vacuum to the south side was closed. That was the reason why there was no vacuum on the gas wells.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/25/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 11/26/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Hallaton placed protective cover on the composite drainage net on the south slope
- No liner bubbles were observed and there was less odors.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 11/26/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 19

CDM

DAILY PROGRESS REPORT

Date: Friday 11/28/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 56

Clear _____ Partly Cloudy _____ Precipitation 0 inch

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

DAY AFTER THANKSGIVING – NO WORK

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 12/01/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 52 Lo Temp 36

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 0

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Rain day (NO WORK)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Tuesday 12/02/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Hallaton placed protective cover on the composite drainage net
- Buildup of gas bubbles underneath the liner continued. Hallaton performed two cuts to let the gas out. These holes were repaired. It was noticed later that a valve on one of the pipes that supply vacuum to the south side was closed. That was the reason why there was no vacuum on the gas wells.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/2/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 12/03/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle placed protective cover on the south slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/3/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Thursday 12/04/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 45 Lo Temp 36

Clear _____ Partly Cloudy _____ Precipitation 0 inch

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle placed protective cover on the south slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 12/4/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 12/05/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle placed protective cover on the south slope and completed covering the entire currently exposed liner on the south slope.
- Thalle started with berms and top soil on the south east corner
- It was noticed that the leachate pond outlet was clogged and the discharge outflow was only 5 gpm. Roto Rooter Plumber was called to remove the clog. The outflow was set to 75 gpm afterwards.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/5/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Monday 12/08/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued protective cover on the south slope.
- AEG has started mobilizing for installation of the permanent gas system. The first equipment has been delivered today.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/8/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 12/09/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 25 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Thalle continued construction of berms on the southeast slope and placement of vegetative cover.
- Thalle performed temporary repair on one of the existing sedimentation basin.
- Thalle gathered material to start the leachate by-pass as part of the pond decommissioning.
- AEG started fusing pipes for the permanent gas system hook up.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/9/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 12/10/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0.07-inch

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle placed protective cover on the south slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/10/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Thursday 12/11/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 52 Lo Temp 36

Clear _____ Partly Cloudy _____ Precipitation 1.5 inches

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to ___

Visitors: _____

Workforce/manpower: 0

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Rain day (NO WORK)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 12/12/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear _____ Partly Cloudy _____ Precipitation 0.09-inch

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle cleaned up mud and sediments accumulated after yesterday's rain.
- Project Representative checked the erosion control in the borrow area for damages. Except one existing stormwater pond (next to the leachate pond), all stormwater devices worked well. Thalle was instructed to provide immediate temporary repair to the stormwater pond.
-Thalle started digging for the leachate pipes to connect the leachate by-pass pipeline. It was discovered that there was a second leachate line connecting to the first downstream of the first valve. Mike Brinchek (CDM) and Bob Brossoie (CDM) were called on this matter. Mike Brinchek came to the site and indicated that he will update the leachate direct piping layout accordingly and the Contractor was asked to hook the second line to the by-pass line using a 90 degree bend and a Wye. The Contractor indicated that he does not have the proper fittings and that this will be completed next week.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/12/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Saturday 12/13/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 47 Lo Temp 25

Clear _____ Partly Cloudy _____ Precipitation 0.-inch

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 5 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

The 45 degree bend used for discharge into the manhole must be replaced by a 90 degree to avoid splashing of leachate. The contractor is to correct it next week.

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

-Thalle continued the construction of the leachate by-pass pipeline. A 45 degree fitting was installed to discharge in the leachate manhole. The leachate valves were reopened and adjusted to allow no more than 70 gpm discharge into the sewer manhole such not to exceed the daily limit.

- flow was monitored by bucket and determined to be equal to 6 GPM. The flow meter monitoring flows from the pond is displaying 4 gpm. In total, 10 gpm is discharging into the sewer manhole.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/13/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	1
Excavators	PC300/CAT	1
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	
Dump Trucks	Cat/Volvo	
ATVs	Kubota	1
Screeners		2
Cars		
Compactor	Smooth drum	
Pumps		
Water Trucks		
Well Point System		
Cranes		
Welder		1
Compressors		

Total **9**

CDM

DAILY PROGRESS REPORT

Date: Monday 12/15/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 70 Lo Temp 54

Clear X Partly Cloudy Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors:

Workforce/manpower: 0

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- AEG started excavating and installing their gas piping on the landfill. They cut through the east slope berm. The trench was inspected by RPR for potential damages to liner and/or composite. No damage was found.
- Thalle screened protective cover in the borrow area.
- Thalle installed protective cover on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/15/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 12/16/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

-Thalle continued installating protective cover and sideslope diversion berm on the south slope - AEG continued excavating and installing gas piping on the landfill. The trench was inspected by RPR for potential damages to liner and/or composite. No damage was found.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/16/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 12/17/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle placed protective cover on the south slope
- Thalle, WGPs and Pine Environmental performed video of Well # 125 to find out if there was any cracks. The pipe was found bent and the video was performed to ensure there was no damage.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/17/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Thursday 12/18/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 45 Lo Temp 36

Clear _____ Partly Cloudy _____ Precipitation 0 inch

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle accidently cut an electric wire that runs from the vault to WGPs, resulting in WGPs losing power. Progress Energy was called in to restore power to WGP plant and secure the wires before Thalle continues working around it. Gas system was down from 01:45 pm to 04:00 pm

-Thalle continued installing protective cover on the south slope and constructing sideslope diversion berms.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/18/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 12/19/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared protective cover in the borrow area
- Thalle installed the erosion control devices for the leachate pond decommission including silt fence and check dams.
- AEG continued with installation of landfill gas collection piping on the landfill. On Saturday December 20, 2009, - AEG left the North Wake landfill to return on January 12, 2009.
- ISCO pipe installed a portable flow meter to monitor flow discharge through the by-pass line.
- Thalle installed the Wye lateral and 90 degree bend to connect the second leachate line (Cell 1 through 5) to the by-pass pipeline.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 12/19/2008
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Monday 12/22/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 70 Lo Temp 54

Clear X Partly Cloudy Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: Burrell Brock (City of Raleigh)

Workforce/manpower: 0

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle notified in the morning that they want to start tearing up the leachate pond today. Bob Brossoie (CDM) indicated that the leachate pond decommissioning shall be postponed until next week to facilitate the sampling as the lab performing the test will be closed from Wednesday noon to Friday to be reopened on 12/29/2008. Thalle has accepted this plan.
- Thalle performed a trial removal of the concrete to determine how easy the removal is. It was noticed that the separation between concrete and liner material was not easy and proposed to saw cut the three areas where liner and concrete samples will be taken.
- RPR worked with Thalle to open the leachate line valves such that the weekly discharge limit into city of Raleigh manhole is not exceeded.
- Burrell Brock (city of Raleigh) visited the NWLF closure site to look at the by-pass line. He went over the leachate by-pass with RPR and expressed satisfaction regarding the by-pass setup and the area velocity flow meter. He requested weekly total flows by e-mail

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/22/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 12/23/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

-The leachate pond was showing 3 GPM discharge from the pond. RPR called Bob Brossoie and Rotto Rooter plumbers were called to unclog the pond. The flow rate from the pond was set at 67 gpm. With the by-pass flowing at 7 gpm, the total flow into the city manhole is 74 gpm.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/23/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 17

CDM

DAILY PROGRESS REPORT

Date: Monday 12/29/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 70 Lo Temp 54

Clear X Partly Cloudy Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: Burrell Brock (City of Raleigh)

Workforce/manpower: 0

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle started removing the leachate pond and disposing into the landfill.
- CDM inspected leachate pond removal as it was performed. Subgrade of the leachate pond did not present any apparent saturation. Thalle removed about 1/3 of the leachate pond.
- Thalle was directed to add dry soil to the remaining liquid and mud in the pond to be able to load it to the landfill and compact.

Bob Brossoie (CDM) was informed of the progress made on Monday.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/29/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 12/30/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 15 Thalle 10 Hallaton

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued removing the leachate pond and disposing into the landfill.
- CDM inspected leachate pond removal as it was performed. Subgrade of the leachate pond did not present any apparent saturation. Thalle removed about 2/3 of the leachate pond.
- CDM indicated to Thalle the 3 areas where the samples need to be taken (middle, side and sump area). Sampling will take place on Wednesday morning by Aaron Weispfenning.

Bob Brossoie (CDM) was informed of the progress made on Tuesday.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/30/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 12/31/2008

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle completed removal of the leachate pond.
- CDM inspected leachate pond removal as it was performed. Subgrade of the leachate pond did not present any apparent saturation. In addition to the concrete and liner, Thalle scrapped off about 4 inch of clay liner.
- Aaron Weispfenning. (CDM) took three samples (middle, side and sump area) and sent to the laboratory for testing. The results will be compared to drinking water standards to decide whether additional clay liner should be removed.
- While starting to dig the area between the valve vault manhole and the pond, some liquid was noticed which was suspected to be leachate. Bob Brossoie (CDM) was alerted and directed Thalle to remove the entire discharge pipe and check the bedding for saturated areas. This work will be completed on Monday 1/5/2009 after holidays.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 12/31/2008

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Monday 1/05/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear ____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: ____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: ____

Defective work/deficiencies noted today to be corrected later: ____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): ____

- Thalle removed the leachate discharge pipe going from the leachate pond into the manhole. The bedding was inspected by CDM for saturated areas. No problem was found below the discharge pipe. However, the soil beneath the vault manhole was wet. It was decided that these soil must be excavated and dumped into the landfill and that a sample must be taken below the vault to decide whether additional soil needs to be removed.
John Roberson (Wake County) visited the site and agreed with the steps being taken by CDM and Thalle.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/5/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 1/06/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 25 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

NO WORK DUE TO WEATHER CONDITIONS

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Wednesday 1/07/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

NO WORK DUE TO WEATHER CONDITIONS

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 1/08/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 52 Lo Temp 36

Clear _____ Partly Cloudy_____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to ___

Visitors: _____

Workforce/manpower: 0

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

Rain day (NO WORK BY THALLE)

_____

CDM received the results from the lab regarding the leachate pond liner clay liner. Everything looked good as compared to drinking water standards, except Arsenic in samples S-2 and S-3, Thallium in S-3, and Vanadium in all 3 samples exceeded their Remediation Goals. CDM contacted the State and was directed to demonstrate that these compounds are naturally occurring. CDM has decided to take additional sample outside of the pond and upgradient of the leachate and send to the lab. Results will conform weather these coumpounds are naturally occurring.

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 1/09/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Aaron Weispfenning (CDM) took a sample from an area next to the borrow area for testing by the laboratory to demonstrate that the compounds found in the leachate pond subgrade are naturally occurring onsite. The results are expected for next week.
- Thalle prepared protective cover in the borrow area

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 1/9/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Monday 1/12/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle started building the 4 % slope in the crown area
- Thalle continued excavation for liner flaps on the south slope
- AEG has remobilized for installation of the permanent gas system.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/12/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 19

CDM

DAILY PROGRESS REPORT

Date: Tuesday 1/13/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 0.

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 25 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Hallaton arrived onsite and started by patching the hole made by AEG as part of the Installation of their permanent gas system.
- AEG continued working on the North Slope. A pinhole was discovered in the trench and RPR instructed AEG to have the pinhole patched by Hallaton.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/13/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 1/14/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover soil in the borrow area
- Thalle placed protective cover soil in the crown area to create the 4 % slope.
- Hallaton installed liner flaps on the south slope berms
- AEG continued installation of gas pipes on the North Slope. RPR inspected trenches excavated and found no damages.
- Progress Energy removed the 25 kVA and 75 kVA transformers from the leachate ponds.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/14/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Thursday 01/15/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 52 Lo Temp 36

Clear _____ Partly Cloudy_____ Precipitation 1.5 inches

Contractor: Thalle Construction

Hours Worked: 0 ; from ___ am to ___

Visitors: _____

Workforce/manpower: 0

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Thalle stripped the remainder of the south slope and start installing intermediate cover
- AEG continue working on the northwest slope area of the landfill
-Hallaton continued with rain flaps on the south slope berms

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/15/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 01/16/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle) + 6 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle prepared vegetative cover in the borrow area
- Thalle stripped the remainder of the south slope and start installing intermediate cover
- AEG continue working on the northwest slope area of the landfill
-Hallaton continued with rain flaps on the south slope berms
-Hallaton left the site to return in about a week

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/16/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Monday 1/19/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Chambers Electric (Thalle's subcontractor) removed electrical panels, sampler and other equipments from the vault area.
- Thalle started backfilling and compacting the leachate pond. Compaction was performed by a Ingersol Rand SD100D vibrating roller

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 1/19/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 01/20/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 5-inch of snow.

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 25 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

NO WORK- SNOW

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Wednesday 01/21/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Work was minimal due to previous day's snow. No work on the hill
- Thalle continued backfilling and compacting the leachate pond.
- Terracon performed a compaction test on the pond backfill soil and found that the 95 % compaction ratio was achieved.
- Vann Burbock (Joyce Engineering) started the leachate sampling for the month of January using a portable auto sampler running on batteries

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/21/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Thursday 01/22/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 52 Lo Temp 36

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Vann Burbock (Joyce Engineering) completed the leachate sampling for the month of January 24 hours after starting it.
- Thalle removed the valve vault manhole and removed wet soil underneath the vault.
- Thalle continued backfilling of the leachate pond.
- Thalle continued placement of protective cover on the south slope and preparing grades for liner installation.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/22/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 01/23/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued backfilling of the leachate pond.
- Terracon performed a second compaction test on the leachate pond backfill
- Thalle continued placement of protective cover on the south slope and preparing grades for liner installation.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/23/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Monday 1/26/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 61 Lo Temp 32

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- CDM performed a sampling on the soil beneath the manhole. The test results will tell whether there was a contamination beneath the manhole.
- Thalle continued backfilling the leachate pond.
- Terracon performed a third compaction test on the soil
- AEG continued installation of gas pipe on the west slope.
- Thalle provided CDM with the as-built survey of the liner subgrade to ensure that it is in conformance with the park project grades.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/26/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 01/27/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation showers

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- CDM verified the grades achieved in the crown area and indicated to Thalle that additional fill material needs to be placed on the crown area to achieve the 5 % minimum slope.
- Thalle moved additional material to crown area and surveyed the final grade for CDM to recheck.
- AEG continued working on the west slope.
- Thalle continued placing fill material in the leachate pond. Compaction test results were provided by Terracon and showed that compaction ratio of 95 % was achieved on the first lift but not on the second. CDM directed Thalle to recompact the second lift and have Thalle retest again later this week.
- Work was stopped at 10:00 AM due to weather conditions.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 1/27/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 01/28/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 59 Lo Temp 49

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 06:30 pm

Visitors: _____

Workforce/manpower: 10 Hallaton men

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton was onsite making sandbags

NO WORK PERFORMED BY THALLE DUE TO WEATHER CONDITIONS

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 01/29/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 52 Lo Temp 36

Clear _____ Partly Cloudy_____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 17 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued backfilling the leachate pond.
- Terracon performed compaction test on the pond backfill and indicated that the material was too wet. Contractor was instructed to scarify, let the subgrade soil dry and recompact to retest on Friday January 30, 2009.
- Jim Onofrio (DTE) indicated that the flare has been kicking on and off because AEG has left about 5 wells unconnected before the weather hit.DTE to reconnect these wells on Friday January 30, 2009.
- Hallaton installed rain flap on the highest south slope berm.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/29/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 01/30/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 25 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued backfilling of the leachate pond. RPR noticed that the Contractor was installing fill material in 2 ft lifts. The Contractor was instructed to cut the lifts down to a foot or less.
- Terracon performed a compaction test on the leachate pond backfill. This test is the follow-up of the tests performed on Thursday that fail. The new 5 tests passed this time.
- Hallaton installed LLDPE liner on about half of the crown area (east side). Air test was also completed. Panel layout was performed in the North South direction due to final liner subgrade in the crown area. Bob Brossoie and Mike Brinchek (CDM) agreed that Hallaton will only provide an as-built drawing and no need to update the proposed panel layout.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/30/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 01/31/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton continued liner installation on the crown area

- CQA forms, DT samples were taken, seaming, air testing.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 1/31/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	1
Excavators	PC300/CAT	2
D6 Dozers	CAT	
D7 Dozers	CAT	
Grader	CAT	
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	
Screeners		
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **8**

CDM

DAILY PROGRESS REPORT

Date: Monday 2/02/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 35

Clear X Partly Cloudy Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors:

Workforce/manpower: 20 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle continued backfilling the leachate pond. About 3 ft of fill material is necessary to fill up the entire pond.
- Due to rain forecasted on Monday night, Thalle made the decision to continue with liner on the south slope instead of installing geocomposite in the crown area to reduce washouts on the south slope. Therefore, liner was installed on the south slope.
- Thalle started removing sediments from the northwest existing sediment pond.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/2/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 02/03/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 58 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation 2-inch

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 Thalle 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued placing fill material in the leachate pond.
- Hallaton completed repairs and details on the crown area and started placing geocomposite drainage net.
- Work by Thalle was limited due to wet slopes from previous night rain.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 2/3/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 02/04/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 30

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 21 Thalle 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued backfilling the leachate pond.
- Hallaton performed repairs and DT sampling on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/4/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Thursday 02/05/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 36 Lo Temp 18

Clear _____ Partly Cloudy_____ Precipitation 0_____

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 17 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued backfilling the leachate pond. Thalle used material from outside source. RPR analyzed the nature of the soil and found that it was similar to the borrow area material and free of organic material. Terracon performed a compaction test on the fill including a one-point compaction test on the pond. Terracon grabbed a soil sample from the mount next to the leachate outside source material. The purpose was to determine if this material is suitable for use as leachate pond backfill material using one-point test.

- AEG continued installation of the permanent gas system, and worked on the phase 1 area on the east slope.

- Hallaton suspended work because of freezing weather conditions. The highest temperature was 34 degree, which makes it difficult to obtain good wedge seams.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/5/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 02/06/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle workers had a training class therefore they did not perform any work.
- Hallaton installed liner material on the south slope

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 2/6/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Saturday 02/07/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton continued liner installation on south slope

- CQA forms, DT samples were taken, seaming, air testing.

- Hallaton has left the site as of this Saturday to return on next week to finish liner details and start composite

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/7/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	1
Excavators	PC300/CAT	2
D6 Dozers	CAT	
D7 Dozers	CAT	
Grader	CAT	
Dump Trucks	Cat/Volvo	2
ATVs	Kubota	
Screeners		
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **8**

CDM

DAILY PROGRESS REPORT

Date: Monday 2/09/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 66 Lo Temp 40

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

RPR was out sick
Thalle performed minimal routine work

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Tuesday 02/10/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 73 Lo Temp 48

Clear X Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 Thalle 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Following an odor complaint on e-mail on 02/09/2009, RPR performed a follow-up to identify the source of the odor. No apparent problem could be determined. May be due to the fact that only a small portion of the south slope is unlined and odor is coming from there.
- Inspection of AEG trenches. No apparent liner damage found
- Protective cover on the crown area

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/10/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 02/11/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 75 Lo Temp 54

Clear X Partly Cloudy _____ Precipitation 0.04

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 21 Thalle 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Inspection of AEG trenches.
- RPR collected manhole invert data with Bob Weisse (Thalle's surveyor) for the park project
-Leachate sampling with Robert Winfield (Joyce Engineering)
- Protective cover on the crown area

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/11/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Thursday 02/12/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 62 Lo Temp 51

Clear _____ Partly Cloudy_____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 11 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 7 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Minor work by the Contractor due to weather
- RPR verified intermediate cover quantities with Thalle surveyor Bob Weisse for payment.
- RPR completed the leachate sampling event with Robert Winfield (Joyce Engineering)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/12/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 02/13/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 37

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Repairs, DTs on the South slope liner + CQA forms filled out with Hallaton
- Retest of the leachate pond final lift by Terracon as a follow-up of the last failing test
- Inspection of AEG trenches. No damage to liner was noticed.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/13/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Saturday 02/14/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 41 Lo Temp 28

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 9 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton continued liner installation on south slope

- CQA forms, DT samples were taken, seaming, air testing.

- Repair of AEG's damages to the liner on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Sunday 02/15/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 41 Lo Temp 28

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 9 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton continued liner repairs on south slope

- CQA forms, seaming, air testing etc,,,, were performed

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 2/16/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 66 Lo Temp 40

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 9 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton performed repairs of the liner installed on the south slope
- Hallaton installed composite drainage net on the South Slope
- Thalle performed minor cleanup work on the landfill and in the borrow area and helped Hallaton

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/16/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 02/17/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 40 Lo Temp 24

Clear X Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 20 Thalle 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton installed composite on the south slope
- Thalle continued with protective cover soil installation and compaction on the south slope
- Thalle installed the last set of downdrains on the southwest corner. The inlet is to be completed during installation of the road and after completion of the permanent gas pipe crossing to the road

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/17/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 02/18/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 44 Lo Temp 22

Clear X Partly Cloudy _____ Precipitation 0.32

Contractor: Thalle Construction

Hours Worked: 0 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 21 Thalle 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Weather day

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 02/19/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 50 Lo Temp 27

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 17 (Thalle) 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton installed composite DN on the south slope.
- Thalle continued protective cover installation and compaction on the south slope. RPR noted that Thalle was installing protective cover in lifts higher than 8inch and instructed Thalle to redo the areas of concern. Thalle cooperated.
- RPR instructed Thalle to spray water as there was a fair amount of dust generated. Thalle cooperated.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/19/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 02/20/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 33 Lo Temp 23

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 10 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Liner installation on the remaining portion of the crown area + repairs and CQA forms
- Protective cover on the south slope by Thalle
- A meeting was held in the borrow area between the County, CDM and Thalle to knock down the need for the School Project. It was decided that:
- Thalle tries not to excavate lower than what they have excavated in the borrow area
- Thalle must provide an as-built survey to the Scholl project manager as soon the project is completed
- Thalle leaves all erosion control features in the borrow area in place and provides permanent seeding
- Thalle stock any refuse away from the school footprint

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/20/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Saturday 02/21/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 41 Lo Temp 28

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 9 (Hallaton)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Hallaton completed installation of composite drainage net on the entire landfill
- Thalle followed Hallaton with protective cover on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 2/23/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 66 Lo Temp 40

Clear _____ Partly Cloudy X Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10.5 ; from 07:00 am to 05:30 pm

Visitors: _____

Workforce/manpower: 20 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Thalle installed protective cover on the south slope.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/23/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 02/24/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 46 Lo Temp 23

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 20 Thalle

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued with protective cover installation on the south slope.
- Thalle prepared baskets for gabions.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 2/24/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 02/25/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 56 Lo Temp 25

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 0 ; from 07:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: 11 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued with protective cover installation on the south slope. Installation of the protective cover was performed from the top down.
- Thalle prepared baskets for gabions.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 2/25/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Thursday 02/26/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 37

Clear _____ Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 10 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- - Thalle continued with protective cover installation on the south slope. Thalle switched protective cover installation from top down to bottom up to speed the installation in preparation to the week end storms.

- Thalle prepared baskets for gabions.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 2/26/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Friday 02/27/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 53

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 9 ; from 07:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 8 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle completed protective cover installation on the south slope. RPR checked thickness by measurement at several, locations and found the thickness at two locations to be less than 18-inch. The contractor was informed and soil was added right away.
- Thalle started building the sideslope diversion berms.
- Thalle and RPR started preparing the site for the week end's rain by removing the channel crossing plastic pipe at the southwest corner and ensuring all ponds have enough volume for the expected flow.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 2/27/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Monday 3/2/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 35 Lo Temp 23

Clear _____ Partly Cloudy _____ Precipitation 0.3 in and 3in of snow

Contractor: Thalle Construction

Hours Worked: 1 ; from 08:00 am to 09:00 am

Visitors: none

Workforce/manpower: none

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

No crews on site due to inclement weather. Trailor locks were frozen and roads were covered.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Tuesday 3/3/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 36 Lo Temp 26

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: none

Workforce/manpower: none

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

No crews on site due to snow covered grounds. Inspected hill for failures in the lining. Reviewed pay requests with Thalle and recorded flow data for the city. Prepared trailor for progress meeting.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Wednesday 3/4/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 7 ; from 08:00 am to 04:00 pm

Visitors: none

Workforce/manpower: none

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

No crews on site due to snow covered grounds. Inspected hill for failures in the lining and cover. Observed Thalle grade remaining South slope. Waited for progress meeting but no one showed up.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Thursday 3/5/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 3 ; from 01:00 pm to 04:00 pm

Visitors: none

Workforce/manpower: none

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Snow melted but minimum personnel on grounds. Inspected hill for failures in the lining and cover. Observed Thalle cover and grade remaining South slope and top of hill.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 3/6/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors: none

Workforce/manpower: none

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Inspected hill for failures in the lining and cover. Observed Thalle cover and grade remaining South slope and top of hill.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 3/9/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 82 Lo Temp 52

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 6.5 ; from 08:30 am to 04:00 pm

Visitors: none

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: none

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

crews on site. Inspected hill for failures in the lining. Recorded flow data for the city. Overseen covering and grading of south slope and top of hill.

Project Representative: C.J. Roebuck Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Tuesday 3/10/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 69 Lo Temp 47

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: 8 (Thalle)

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Held several discussions with Ryan Coward, Bob Brossoie, CJ Roebuck regarding what was done last week while I was on vacation. No major work was accomplished last week due to weather conditions. The ongoing issue is to get the grading plan for the crown area of the landfill. Mike Brinchek and Patrick Stout (CDM) to get the plan to Thalle as soon as possible. Patrick Stout indicated that the total volume of vegetative cover necessary for the crown area is around 450 CY (placed on a total of 24,200 sq ft.)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/10/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 3/11/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Progress Meeting # 15 + Borrow area and leachate pond area meeting. It was decided during the borrow area meeting to construct a ditch to convey storm from the stormwater pond to the creek. The lining of the ditch will be determined by Mike Brinchek in the CDM office. In the borrow area, it was decided to store the tree branches in the side of the borrow where no construction is planned. The need to keep the grades oriented towards the erosion control features was also discussed.
- Observed the installation of erosion control devices in the area west to the leachate pond
Joyce Engineering's technician started the leachate sampling event for March 2009.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/11/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 3/12/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 55 Lo Temp 30

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 10 ; from 08:00 am to 06:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: Leachate Manhole

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

The leachate manhole was delivered onsite. RPR inspected the manhole and made the following notes:

- the outlet pipe boot which was previously shown on the baffle wall has been relocated per our shop drawing feedback.
- the shop drawing did not show the manhole steps, but they were incorporated
- I cannot confirm that the reinforcement was performed as shown on the shop drawing. However, I guess the certification letter already submitted by Thalle takes care of it.

Terracon took 3 vegetative cover samples for organic content tests.

Joyce Engineering's technician completed the leachate sampling event for March 2009.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/12/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 3/13/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X_____ Precipitation 0.54

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors:

Workforce/manpower: 3

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

WEATHER DAY (no real work performed)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 3/16/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 77 Lo Temp 52

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 6.5 ; from 08:30 am to 04:00 pm

Visitors: none

Workforce/manpower: 7 (Thalle) 4 (silt fence subcontractor)

Equipment: See separate list of equipment

Deliveries: none

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle installed erosion control devices in the area west to the leachate pond. Devices to be installed include silt fence, 2 stormwater basins, diversion berms etc …
- RPR checked erosion control devices installed Vs plans.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/16/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 3/17/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 69 Lo Temp 47

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: 8 (Thalle)

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued installation of the erosion control devices in the area west to the leachate pond.
- RPR review soil conformance test data with the Contractor and geotechnical engineer Sacit Akbas (CDM)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/17/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 18

CDM

DAILY PROGRESS REPORT

Date: Wednesday 3/18/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear X Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

- RPR discussed sampling station plan with Greg (CDM Instrumentation Engineer) and Ryan Coward (Superintendant).

- Thalle excavated for liner flaps on the south slope. RPR inspected the uncovered liner for potential damages, and found nothing.

- Installation of erosion control devices in the area west to the leachate pond (stormwater ponds and diversion berms).

_____

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/18/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 3/19/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 30

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 10 ; from 08:00 am to 06:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued excavation for liner flaps on the south slope
- RPR returned to CDM office to hold a discussion regarding the CQA report preparation.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/19/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Friday 3/20/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X_____ Precipitation 0.54

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors:

Workforce/manpower: 3

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- A meeting was held at 10:00 AM with the Contractor and the County to go over crown fill grades and the need to provide a minimum of 4 ft minimum of fill in the crown area.
- A damage noticed on the south slope downdrain near the diversion berm was repaired by extrusion weld by Hallaton.
- Thalle excavated for liner flaps on the south slope. Hallaton arrived onsite and started flaps.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/20/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **20**

CDM

DAILY PROGRESS REPORT

Date: Monday 3/23/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 82 Lo Temp 52

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 6.5 ; from 08:30 am to 04:00 pm

Visitors: none

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: none

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

-Hallaton installed liner flaps on the South slope. RPR inspected the liner flaps for potential liner damage.

- Thalle continued installation of the erosion control devices in the area west to the leachate pond.

- Mark up of survey point in the crown area/ identification of the high-point with Bob Weisse (Thalle Surveyor) to achieve the minimum 4 ft of material for the fence.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/23/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 3/24/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 69 Lo Temp 47

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: 8 (Thalle)

Workforce/manpower: 10 (Thalle)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle continued with erosion control in the area west to the leachate pond.
- Thalle excavated for the leachate sampling station and installed stone bedding and placed the base of the manhole.
- Thalle placed additional protective cover material on the crown area and checked thickness of the soil. Material placement and compaction was achieved by a D6 dozer in 8-inch lifts per specification.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 3/24/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 3/25/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Installation of leachate manhole + piping to the City of Raleigh manhole
- Grading in the crown of the landfill
- Compaction test in the crown area by Terracon. One test point was below 92 % which per specification. Contractor offered to use a roller if needed, but Mike Brinchek indicated this was unacceptable as it will sink the crown area. Therefore, it was accepted.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/25/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	3
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 3/26/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 57 Lo Temp 44

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 10 ; from 08:00 am to 06:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Dimensions/pictures of the stormwater pond # 3 and riprap diversion to Mike for verification.

Weather day

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 3/27/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X_____ Precipitation 0.54

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors:_____

Workforce/manpower: 3_____

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

WEATHER DAY

_____

RPR inspected erosion control in the borrow area and in the area west to the leachate pond following rainfall event.

_____

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 3/30/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 82 Lo Temp 52

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: Greg Czerniejewski (CDM- Instrumentation Engineer)

Workforce/manpower: 7 (Thalle)

Equipment: See separate list of equipment

Deliveries: none

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued installation of the new leachate sampling station manhole
- Thalle resume installation of additional protective cover in the crown area
- Thalle fused pipes and laid leachate piping from the sampling station to the City of Raleigh leachate manhole.
- RPR inspected erosion control devices in the area west to the leachate pond. One of the new pond was not discharging properly. Contractor was instructed to make necessary repair.
- RPR met with Greg Czerniejewski (CDM) and Ryan Coward (Thalle) onsite to go over the installation details of the hydroranger plus for the sampling station.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/30/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 17

CDM

DAILY PROGRESS REPORT

Date: Tuesday 3/31/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 69 Lo Temp 47

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: 8 (Thalle)

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Installation of bracket and ultrasonic in the leachate manhole.
- Continuation of leachate piping installation to connect to the City of Raleigh manhole
- Installation of additional protective cover in the crown area of the landfill.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 3/31/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **17**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 4/01/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 70 Lo Temp 53

Clear _____ Partly Cloudy X Precipitation 0.01

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- Thalle installed additional protective cover in the crown area
- AEG remobilized and start digging on the south slope. RPR inspected these trenches for potential damages and found no damage.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/1/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total 17

CDM

DAILY PROGRESS REPORT

Date: Thursday 4/02/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 58

Clear _____ Partly Cloudy _____ Precipitation 0.33____

Contractor: Thalle Construction

Hours Worked: 4 ; from 08:00 am to 12:00 pm

Visitors: none

Workforce/manpower: 2

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Weather day

- RPR reviewed quantities included in March 2009 pay application with Ryan prior to submission

- Review of remaining conformance test on soil to be performed by Thalle

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Friday 4/3/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X Precipitation 0.06

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors:

Workforce/manpower: 2

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

WEATHER DAY

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Saturday 4/4/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X Precipitation 0.06

Contractor: Thalle Construction

Hours Worked: 2 ; from 11:00 am to 1:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

_____

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

_____

_____

_____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

_____

RPR was called in by AEG regarding a damage on the liner. RPR showed up to assess the damage and coordinate repair with Thalle and Hallaton.

_____

_____

_____

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY PROGRESS REPORT

Date: Monday 4/13/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 65 Lo Temp 45

Clear _____ Partly Cloudy _____ Precipitation 0_____

Contractor: Thalle Construction

Hours Worked: 9 ; from 08:00 am to 06:00 pm

Visitors: _____

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: none

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle continued grading in the crown area and topsoil installation. RPR checked to ensure that the additional protective cover being installed is minimum 2 ft as required for this project.
- Leachate sampling with Joyce / helped with flow data

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/13/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 4/14/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 69 Lo Temp 47

Clear X Partly Cloudy _____ Precipitation 0

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: 8 (Thalle)

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle started placing topsoil in the crown area. However, due to shortage in topsoil material, the operation was stopped to resume when additional topsoil is delivered.
- Leachate valves were closed at 07:30 AM to allow decommissioning of the temporary leachate by-pass pipeline and tie-in of the leachate pipe to the manhole. This closure is planned to last about a week.
- Permanent connection of the leachate lines from the landfill to the sampling station.
- Burrell Brock (City of Raleigh) visited the project site to assess project progress. He met with RPR and was walked through what has been accomplished and what needs to be done for the remainder of the construction of the sampling station. He expressed satisfaction and will return to inspect again in the future.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/14/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 4/15/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: none

Workforce/manpower: 7 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle performed grading in the area west to the leachate pond + backfill of the piping trenches and around the sampling station (RPR checked that backfill was done in lifts and properly compacted)

- Until the sampling station becomes fully operational, a temporary connection of the area velocity flow meter to the new pipeline (above ground connection) was done to continue discharge of leachate to the City of Raleigh manhole. Leachate valves remains closed as the connection has yet to be achieved.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/15/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 4/16/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 55 Lo Temp 30

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 10 ; from 08:00 am to 06:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Backfill of the by-pass trench (checked that backfill was done in lifts and properly compacted)
- Grading in the area west to the leachate pond + backfill of the piping trenches and around the sampling station (checked that backfill was done in lifts and properly compacted)
- RPR made several attempts to get in touch with the weir plate manufacturer (Anson Metal out of Charlotte, NC) on the delivery status of the weir plate. The plate is to be made the next day and delivered on Monday to be installed.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/16/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Friday 4/17/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X _____ Precipitation 0.54

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors: Bob Brossoie (CDM)

Workforce/manpower: 3

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

Terracon performed compaction tests on the crown area and in the area west to the leachate pond to ensure that adequate compaction ratio was achieved.

- Bob Brossoie (CDM) visited the project site to assess the progress made since the last progress meeting.

- RPR Followed-up on the weir plate delivery status and confirmed that it will be delivered the next day.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/17/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

DAILY PROGRESS REPORT

Date: Monday 4/20/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 49 Lo Temp 18

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

Grading in the area west to the leachate pond (checked that backfill was done in uniform lifts and properly compacted)

- The V-notch weir was delivered but could not be installed due to lack of tools.
- RPR could not get good reading from the area velocity flow meter, so he called Johnston Inc. to service the meter). Vinnie will show up on Thursday or Friday to service the meter.

Weather delay day

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/20/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Tuesday 4/21/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 82 Lo Temp 52

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 10 ; from 07:00 am to 06:00 pm

Visitors: none

Workforce/manpower: _____

Equipment: See separate list of equipment

Deliveries: none

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Grading in the area west to the leachate pond (checked that backfill was done in lifts and properly compacted)

-Installation of the leachate weir plate.

- At 05:35 pm, the leachate valves were reopened after being closed on Tuesday 4/14/2009 at 07:00 AM.

-RPR worked with Thalle surveyor and Ryan (Thalle) to determine how to raise the valve next to the sampling station. It was decided to raise the stem and install a wheel handle.

- The leachate cleanout also must be raised as result of high park fill grades.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/21/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Wednesday 4/22/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 69 Lo Temp 47

Clear X Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 8 ; from 08:00 am to 05:00 pm

Visitors: _____

Workforce/manpower: 8 (Thalle)

Equipment: See separate list of equipment

Deliveries: _____

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Thalle performed grading in the area west to the leachate pond (RPR checked that the backfill was done in lifts and properly compacted).

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project
Contractor Thalle Construction Co.

Date 4/22/2009

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Thursday 4/23/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 55 Lo Temp 30

Clear _____ Partly Cloudy _____ Precipitation _____

Contractor: Thalle Construction

Hours Worked: 10 ; from 08:00 am to 06:00 pm

Visitors: none

Workforce/manpower: 9 (Thalle)

Equipment: See separate list of equipment

Deliveries: Leachate Manhole

Defective work/deficiencies noted today to be corrected later: _____

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.): _____

- Compaction tests by Terracon in the area next to the leachate pond + leachate pipe backfill.
- Grading in the area west to the leachate pond + backfill of the piping trenches and around the sampling station (checked that backfill was done in lifts and properly compacted)
- Checked all cleanouts in Phase 1 and 2 areas to see how easy it will be for someone to open them per Patrick Stout (CDM) and Mike request. (2 cleanouts in Phase 1 need to be repaired. Thalle was contacted to make the repair and invoice the County)

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 4/23/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	3
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **18**

CDM

DAILY PROGRESS REPORT

Date: Friday 4/24/2009

Project: North Wake Phase 2 Closure Project No.: 6172-55752

Location Raleigh, NC

Weather: Hi Temp 72 Lo Temp 40

Clear _____ Partly Cloudy X_____ Precipitation 0.54

Contractor: Thalle Construction

Hours Worked: 5 ; from 08:00 am to 01:00 pm

Visitors:

Workforce/manpower: 3

Equipment: See separate list of equipment

Deliveries:

Defective work/deficiencies noted today to be corrected later:

Observations of Work Performed (List work in-progress, pay item No., quantity installed, location, comments, problems, delays (and causes thereof), accidents (also fill out Accident Report Form), special instructions given or received, tests performed, etc.):

- RPR onsite with Johnston Inc. to service the meter. (They found that the meter needed to be recalibrated to provide accurate readings as it was moved to a new location).
- RPR performed a site tour with Ryan Coward (Thalle) to assess what is left to do and when the project may be completed.

Project Representative: Farouk Banna Sheet 1 of 1

CDM

DAILY CONSTRUCTION PROGRESS REPORT

Project North Wake Phase 2 Closure Project Date 4/24/2009
Contractor Thalle Construction Co.

Equipment	Type	Number
Loader/Backhoes	Volvo/CAT	2
Excavators	PC300/CAT	2
D6 Dozers	CAT	2
D7 Dozers	CAT	1
Grader	CAT	1
Dump Trucks	Cat/Volvo	4
ATVs	Kubota	2
Screeners		2
Cars		
Compactor	Smooth drum	1
Compactor	Sheep-foot SD100D	1
Pumps		
Water Trucks		1
Well Point System		
Cranes		
Welder		
Compressors		

Total **19**

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 05-02-2009

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary:

Contractor: Thalle Construction

Major Deliveries:

Work Performed:

- Thalle performed grading work in the area west to the leachate pond. RPR checked that backfill was done in uniform lifts and properly compacted.
- Thalle graded the road, the road ditch prior to placement of stones and gabions.
- Thalle placed vegetative cover on the crown area and prepared the cul-de-sac.
- Thalle performed permanent seeding and installed erosion control matting on the landfill.
- Pike Electric installed the transformer at the new leachate sampling station location

Project Representative: Gabrielle Bauer Date: 05/01/2009

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 05-09-2009

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary: _____

Contractor: Thalle Construction

Major Deliveries: _____

Work Performed:

Thalle performed clean up and final dressup of the borrow area

- Chamber Electric (Thalle subcontractor) started installation of the new electrical panel

- Thalle started installation of gabions along the landfill road ditch and installed the downdrain pipe crossing to the access road.

Project Representative: _____ Date: 05/08/2009

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 05-16-2009

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary:

Contractor: Thalle Construction

Major Deliveries:

Work Performed:

Thalle continued clean up and final dress up of the site

- Terracon performed compaction tests on the road subgrade prior to installation of gravel.

- Johnston Inc. serviced the area velocity flow meter to ensure that leachate flow readings are accurate).

Project Representative: Gabrielle Boerner Date: 05/15/2009

CDM

WEEKLY PROGRESS SUMMARY REPORT

Week Ending: 05-23-2009

Project: North Wake Landfill Phase II Closure Project No.: 6172-55752

Location: 9100 Deponie Dr Raleigh, NC, 27614

Weather Summary:

Contractor: Thalle Construction

Major Deliveries:

Work Performed:

- CDM, Wake County and Thalle performed the substantial walk-thru and identify a list of items to be corrected prior to Final Completion (See list attached and corrections made).

Project Representative: Gabrielle Boerner Date: 05/22/2009

CDM

Deficiencies & Omissions List June 4, 2009 Update

Project: North Wake Phase 2 Closure Project Project No.: 6172-67123

Area/Structure Landfill Closure Cap, Leachate Sampling Station Area, Borrow Area

Date Corrected	Name	Date Observed	Description of Item	Remarks
May 22, 2009	Farouk Banna	May 20, 2009	Add stone to final grade access road to top of LF including turnaround in crown area. Compact stone in turnaround & remove excess soil at edges.	Grass has yet fully established in the corners
June 26 2009	Farouk Banna	May 20, 2009	Complete remaining sampling station work including electrical work, start-up and testing of equipment, permanent tie-in to the City of Raleigh sewer, installation of ABC stone, fencing & cleanup.	
June 5 2009	Farouk Banna	May 20, 2009	Complete level spreader in the leachate pond area per Erosion Control Plan; temporary seed & reinstall fence for site security.	
June 12 2009	Farouk Banna	May 20, 2009	Fix damages in the fabric-wrapped stone "burrito" on the landfill slopes.	
June 12 2009	Farouk Banna	May 20, 2009	Fill gaps underneath the stone "burrito" on the South Slope	
June 12 2009	Farouk Banna	May 20, 2009	Fix damages in the composite drainage net on S Slope. Check integrity of the liner & Hallaton make repairs as needed.	

CDM

June 3, 2009	Farouk Banna	May 20, 2009	Remove large metal plates from perimeter road at entrance to borrow area and haul offsite.	A piece was left behind Sandled to shop No way to cut it
June 9 2009	Farouk Banna	May 20, 2009	Farrell Kidd/Wake Co. select pipe in borrow area for post-closure use or dispose offsite.	
June 25, 2009	Farouk Banna	May 20, 2009	Fix downdrain flared inlets to correct washouts & provide positive drainage. Replace grates at downdrain inlets with 1 ¼" diameter galvanized steel pipe.	
May 27 2009	Farouk Banna	May 20, 2009	Lower downdrain inlets in roadway ditchline & provide additional stone for positive drainage.	
June 12 2009	Farouk Banna	May 20, 2009	Fix matting on the N slope swale/berm and install additional staples to hold matting in place.	
June 9 2009 and June 26 2009	Farouk Banna	May 20, 2009	Complete permanent seeding of landfill slope (include reseeding bare spots) and provide spray on growth additive at locations indicated by Engineer.	Additive was Sprayed on June 26 2009 due to weather
May 26, 2009	Farouk Banna	May 20, 2009	Complete grading and temporary seeding in the backfill area west of the leachate pond to include all erosion control measures.	

CDM

May 29 2009	Farouk Banna	May 20, 2009	Remove all rocks, sandbags, roots, rebar, and other debris from the surface of the landfill	
June 12, 2009	Farouk Banna	May 20, 2009	Remove accumulated sediment on the lowest berm of N slope.	
June 8, 2009	Farouk Banna	May 20, 2009	Trim exposed excess liner @ drainage flap on S slope	
June 5, 2009	Farouk Banna	May 20, 2009	Remove rocks & debris from seeded surface of borrow area. Reuse rocks for onsite erosion control or haul offsite.	
June 19 2009	Farouk Banna	May 20, 2009	Fix damage to the concrete perimeter road to the satisfaction of the Owner.	
June 19 2009	Farouk Banna	May 20, 2009	Fix skimmer in borrow area sediment basin & add baffles as directed by NCDENR DLR.	Only baffles were installed on 6/19/2009 All other measures were in place On 6/12/2009
June 2 2009	Farouk Banna	May 20, 2009	Remove clearing debris from borrow area & dispose offsite.	
June 12 2009	Farouk Banna	May 20, 2009	Regrade & reseed slope areas disturbed by seeding subcontractor in N slope.	
June 12 2009	Farouk Banna	May 20, 2009	Level soil cover around gas wells and permanent seed.	
June 25 2009	Farouk Banna	May 20, 2009	Remove soil from inside downdrain inlets.	
June 11 2009	Farouk Banna	May 20, 2009	Remove sediment from perimeter concrete ditch at drop inlet.	

CDM

June 22 2009	Farouk Banna	May 20, 2009	Replace sediment contaminated stone from road to old cell area & replace with clean stone.	
June 9 2009	Farouk Banna	May 20, 2009	Reseed slope area adjacent to gabion lined ditch.	
June 8 2009	Farouk Banna	May 20, 2009	Regrade area at top of gabion lined channel to remove ponding & provide positive drainage.	
June 19 2009	Farouk Banna	May 20, 2009	Address erosion control repairs noted by DLQ in their site visit report dated 5/29/09.	

APPENDIX A-2

Intermediate Cover Conformance Testing

Geotechnics
INTEGRITY IN TESTING

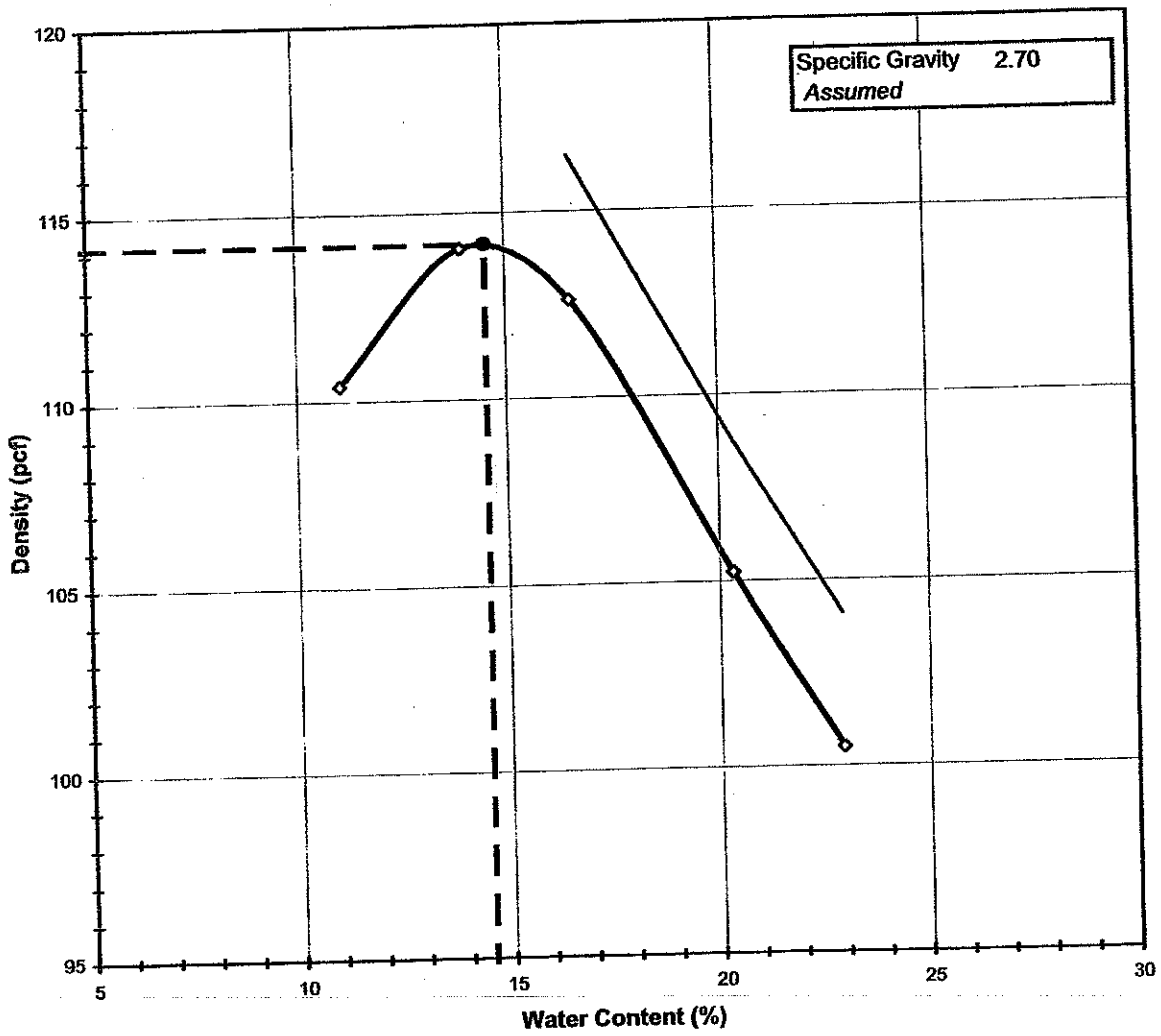
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-01	Sample No.	IC-4K
Lab ID	2008-606-01-02	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content 14.5
Maximum Dry Density 114.2



Tested By SD *Date* 7/27/2008 *Checked By* GBM *Date* 7-28-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-01	Sample No.	IC-4K
Lab ID	2008-606-01-02		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	19033
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	1
Percent Retained on 3/8"	3
Percent Retained on #4	5
Oversize Material	Not included
Procedure Used	B

TestType		STANDARD
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4326
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6167	6278	6297	6227	6181
Wt.of Mold (gm)	4326	4326	4326	4326	4326
Wt. of WS	1841	1952	1971	1902	1855
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	308	311	A-5	SS-2	SS-4
Wt. of Tare & WS (gm)	742.70	762.70	610.40	654.20	634.60
Wt. of Tare & DS (gm)	679.96	679.60	537.86	560.83	535.11
Wt. of Tare (gm)	110.90	83.70	99.00	101.10	100.80
Wt. of Water (gm)	62.74	83.10	72.54	93.37	99.49
Wt. of DS (gm)	569.06	595.90	438.86	459.73	434.31
Wet Density (gm/cc)	1.96	2.08	2.10	2.03	1.98
Wet Density (pcf)	122.6	130.0	131.2	126.6	123.5
Moisture Content (%)	**11.0**	**13.9**	**16.5**	**20.3**	**22.9**
Dry Density (pcf)	**110.4**	**114.0**	**112.6**	**105.2**	**100.5**

Zero Air Voids

Moisture Content (%)	16.5	20.3	22.9
Dry Unit Weight (pcf)	116.5	108.8	104.1

Tested By SD *Date* 7/27/2008 *Checked By* GM *Date* 7-28-08

DCN:GT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

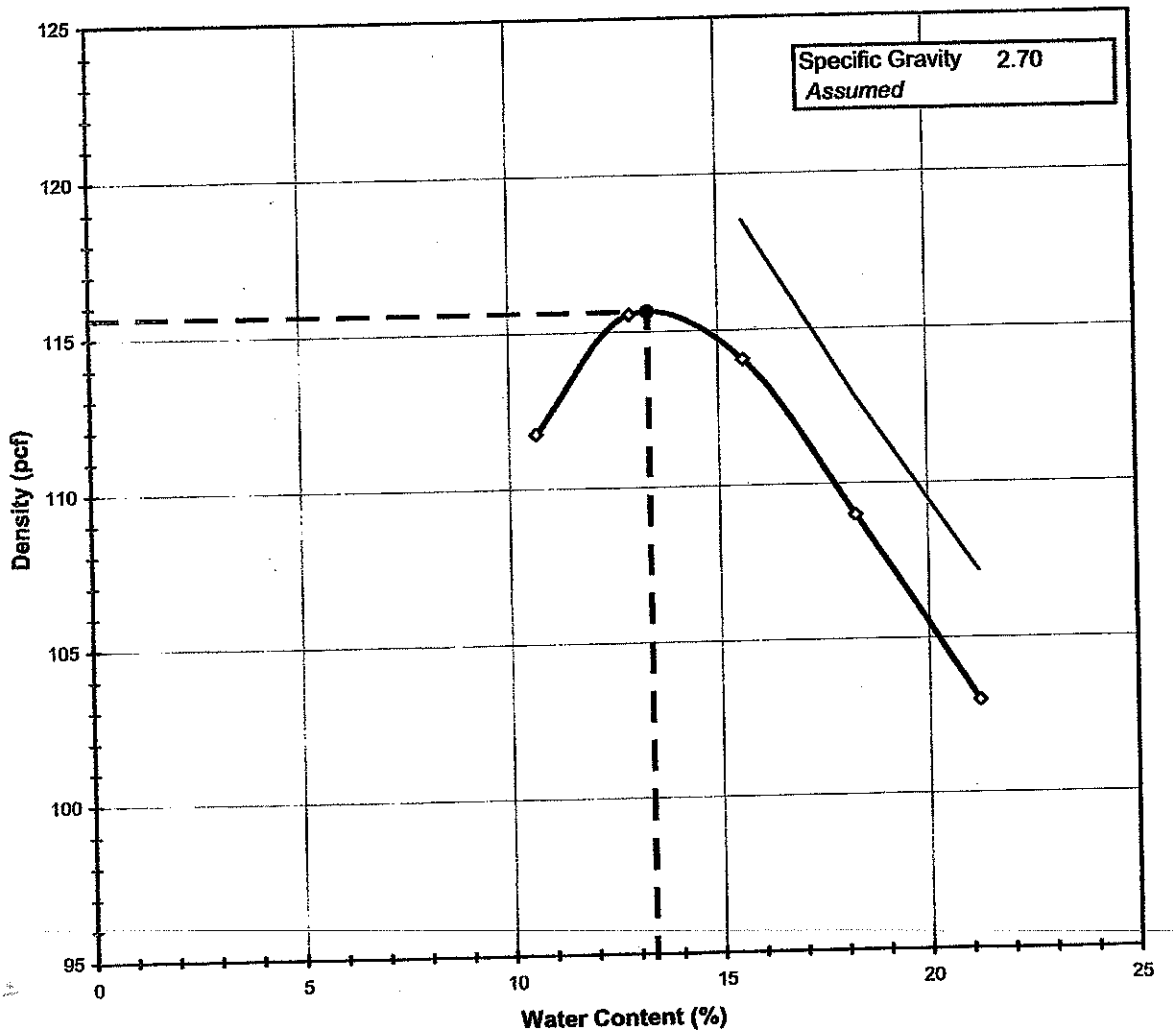
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO,INC.	Boring No.	IC8K
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-02	Sample No.	NA
Lab ID	2008-606-02-01	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content 13.4
Maximum Dry Density 115.6



Tested By SD *Date* 7/31/2008 *Checked By* GBM *Date* 8-1-08

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO,INC.	Boring No.	IC8K
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-02	Sample No.	NA
Lab ID	2008-606-02-01		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	22381
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	1
Percent Retained on 3/8"	3
Percent Retained on #4	4
Oversize Material	Not included
Procedure Used	A

TestType		STANDARD
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4325
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6183	6285	6306	6261	6200
Wt.of Mold (gm)	4325	4325	4325	4325	4325
Wt. of WS	1858	1960	1981	1936	1875
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	399	305	317	315	318
Wt. of Tare & WS (gm)	705.40	706.70	644.50	638.30	635.20
Wt. of Tare & DS (gm)	645.84	635.57	568.89	556.78	539.27
Wt. of Tare (gm)	86.30	84.60	84.50	110.40	87.00
Wt. of Water (gm)	59.56	71.13	75.61	81.52	95.93
Wt. of DS (gm)	559.54	550.97	484.39	446.38	452.27
Wet Density (gm/cc)	1.98	2.09	2.11	2.07	2.00
Wet Density (pcf)	123.7	130.5	131.9	128.9	124.8
Moisture Content (%)	**10.6**	**12.9**	**15.6**	**18.3**	**21.2**
Dry Density (pcf)	**111.8**	**115.5**	**114.0**	**109.0**	**103.0**

Zero Air Voids

Moisture Content (%)	15.6	18.3	21.2
Dry Unit Weight (pcf)	118.5	112.8	107.1

Tested By SD *Date* 7/31/2008 *Checked By* GM *Date* 8-1-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

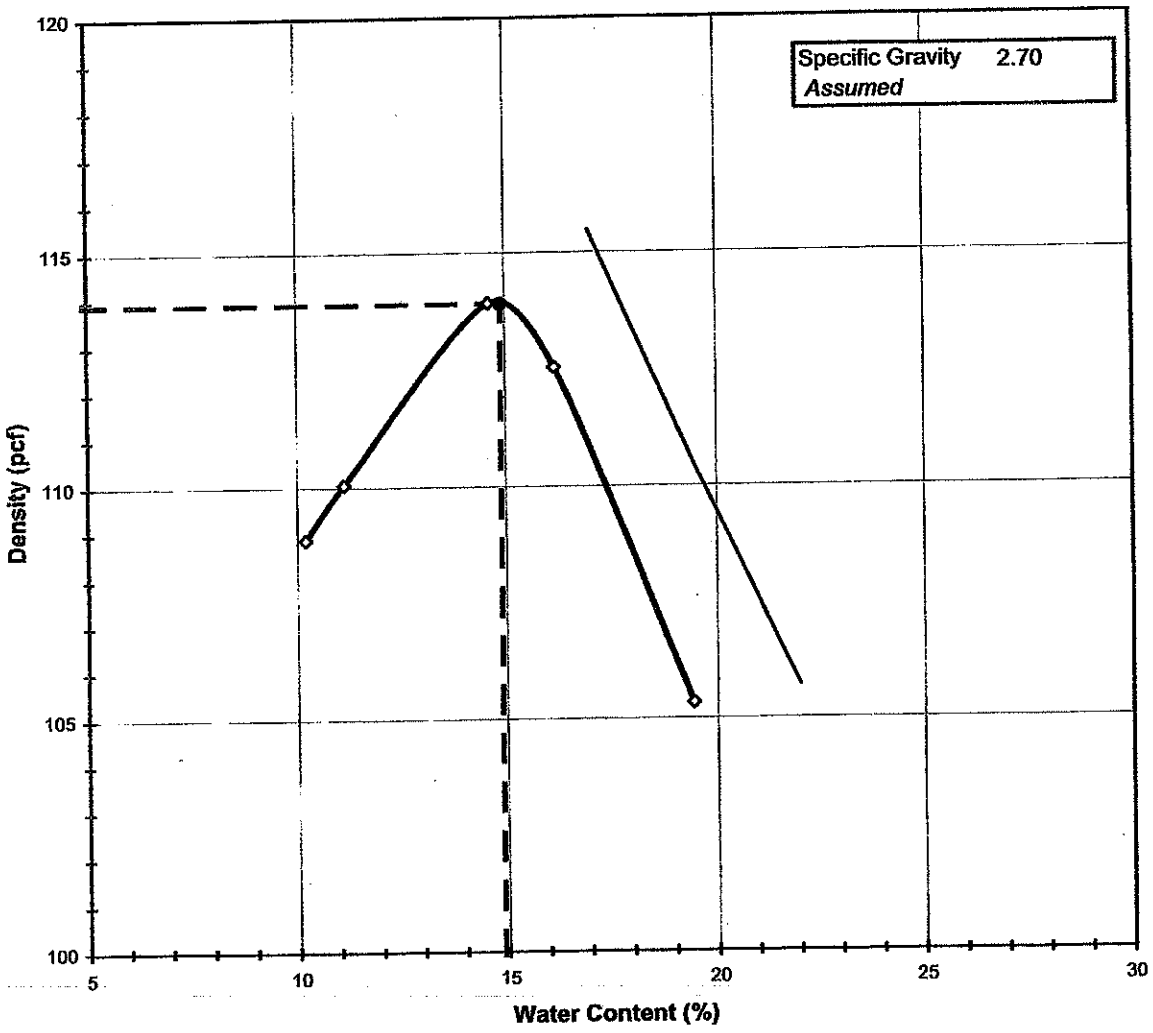
MOISTURE DENSITY RELATIONSHIP

ASTM D1557-91 SOP-S13

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-03	Sample No.	IC12-K
Lab ID	2008-606-03-01	Test Method	**STANARD**

Visual Description: DARK BROWN CLAYEY SAND

Optimum Water Content 14.9
Maximum Dry Density 113.9



Tested By TMS *Date* 8/5/2008 *Checked By* GEM *Date* 8-6-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D1557-91 SOP-S13

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-03	Sample No.	IC12-K
Lab ID	2008-606-03-01		

Visual Description: DARK BROWN CLAYEY SAND

Total Weight of the Sample (gm)	23895
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	7
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	C

TestType		STANARD
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	173
Mold diameter		6
Weight of the Mold		5560
Volume of the Mold(cc)		2120

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	9637	9715	9997	10003	9835
Wt.of Mold (gm)	5560	5560	5560	5560	5560
Wt. of WS	4076	4155	4436	4442	4274
Mold Volume (cc)	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number	317	315	310	303	311
Wt. of Tare & WS (gm)	927.15	715.36	619.39	820.60	725.61
Wt. of Tare & DS (gm)	849.18	654.84	554.51	721.79	621.28
Wt. of Tare (gm)	84.23	110.37	110.22	110.96	84.28
Wt. of Water (gm)	77.97	60.52	64.88	98.81	104.33
Wt. of DS (gm)	764.95	544.47	444.29	610.83	537.00

Wet Density (gm/cc)	1.92	1.96	2.09	2.10	2.02
Wet Density (pcf)	120.0	122.3	130.6	130.7	125.8
Moisture Content (%)	**10.2**	**11.1**	**14.6**	**16.2**	**19.4**
Dry Density (pcf)	**108.9**	**110.1**	**113.9**	**112.5**	**105.3**

Zero Air Voids

Moisture Content (%)	17.0	19.5	22.0
Dry Unit Weight (pcf)	115.5	110.4	105.7

Tested By TMS *Date* 8/5/2008 *Checked By* GEM *Date* 8-6-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

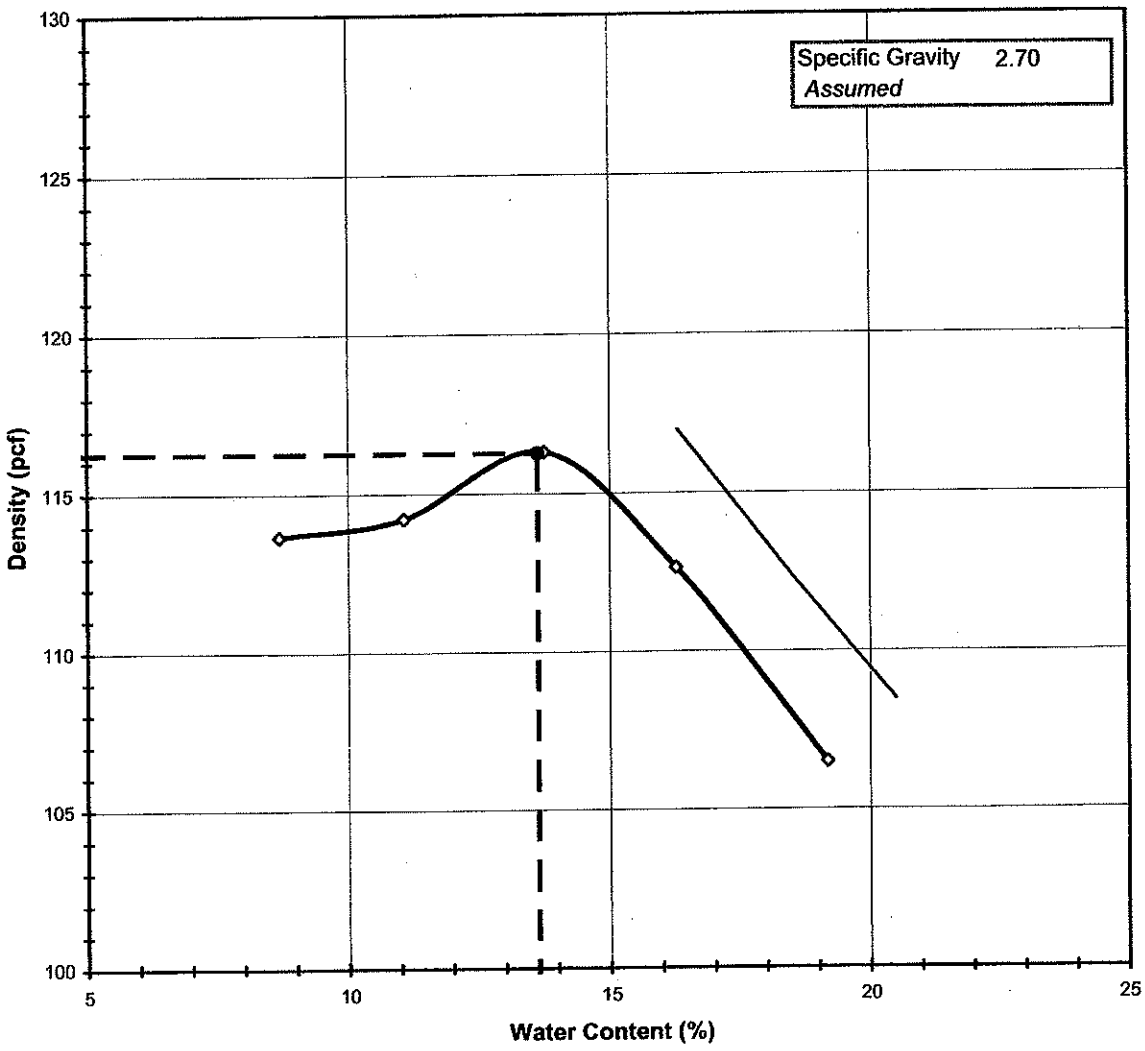
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC16K
Lab ID	2008-606-04-01	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content **13.6**
Maximum Dry Density **116.3**



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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC16K
Lab ID	2008-606-04-01		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	22828
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	4
Percent Retained on #4	7
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4325
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6180	6230	6312	6292	6231
Wt.of Mold (gm)	4325	4325	4325	4325	4325
Wt. of WS	1855	1905	1987	1967	1906
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	G-13	301	K-7	304	309
Wt. of Tare & WS (gm)	710.80	619.60	815.90	765.70	817.30
Wt. of Tare & DS (gm)	666.30	566.26	730.58	674.05	703.45
Wt. of Tare (gm)	153.70	84.30	110.40	110.60	109.60
Wt. of Water (gm)	44.50	53.34	85.32	91.65	113.85
Wt. of DS (gm)	512.60	481.96	620.18	563.45	593.85

Wet Density (gm/cc)	1.98	2.03	2.12	2.10	2.03
Wet Density (pcf)	123.5	126.9	132.3	131.0	126.9
Moisture Content (%)	**8.7**	**11.1**	**13.8**	**16.3**	**19.2**
Dry Density (pcf)	**113.7**	**114.2**	**116.3**	**112.6**	**106.5**

Zero Air Voids

Moisture Content (%)	16.3	18.5	20.5
Dry Unit Weight (pcf)	117.0	112.4	108.5

Tested By SD *Date* 8/18/2008 *Checked By* [signature] *Date* 8-19-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

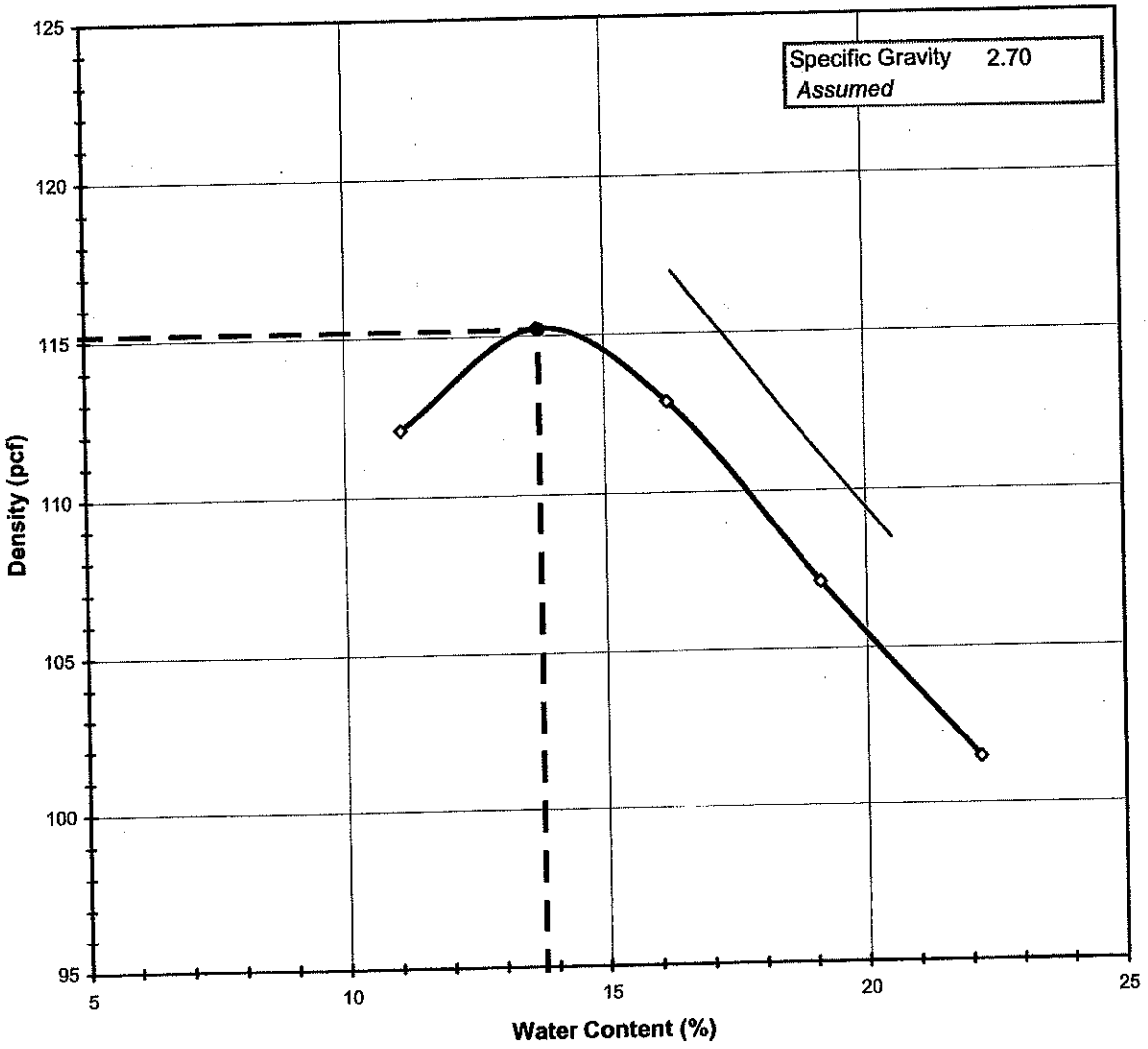
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC20K
Lab ID	2008-606-04-02	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content 13.7
Maximum Dry Density 115.2



Tested By SD *Date* 8/18/2008 *Checked By* Gem *Date* 8/2008

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC20K
Lab ID	2008-606-04-02		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	23116
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	4
Percent Retained on #4	6
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4326
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6196	6294	6296	6242	6188
Wt.of Mold (gm)	4326	4326	4326	4326	4326
Wt. of WS	1870	1968	1970	1916	1862
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	305	G-15	319	318	397
Wt. of Tare & WS (gm)	730.20	898.30	874.10	874.10	850.70
Wt. of Tare & DS (gm)	665.85	808.25	781.29	767.17	734.05
Wt. of Tare (gm)	84.50	150.90	208.40	207.80	208.10
Wt. of Water (gm)	64.35	90.05	92.81	106.93	116.65
Wt. of DS (gm)	581.35	657.35	572.89	559.37	525.95
Wet Density (gm/cc)	2.00	2.10	2.10	2.04	1.99
Wet Density (pcf)	124.5	131.0	131.1	127.6	124.0
Moisture Content (%)	**11.1**	**13.7**	**16.2**	**19.1**	**22.2**
Dry Density (pcf)	**112.1**	**115.2**	**112.9**	**107.1**	**101.5**

Zero Air Voids

Moisture Content (%)	16.3	18.5	20.5
Dry Unit Weight (pcf)	117.0	112.4	108.5

Tested By SD *Date* 8/18/2008 *Checked By* GBM *Date* 8-20-08

DCN:GT-S12 DATE:12/11/00 REVISION 5

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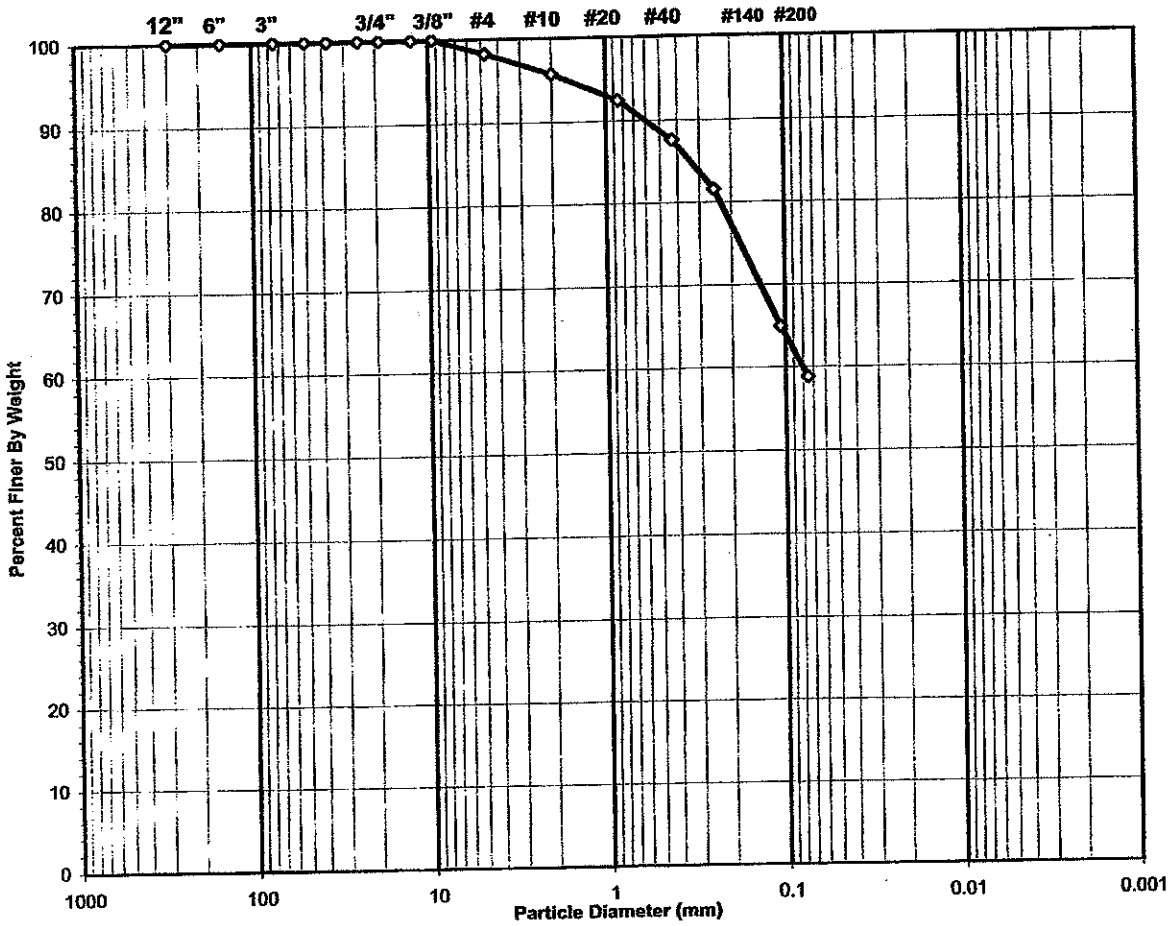
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-01	Sample No.	IC-4K
Lab ID	2008-606-01-02	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By SD Date 7/25/2008 Checked By Gem Date 7-30-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-01	Sample No.	IC-4K
Lab ID	2008-606-01-02	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	200	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	575.30	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	516.29	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.95	Weight of Tare (gm)	NA
Weight of Water (gm)	59.01	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	344.34	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**17.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	344.34
Dry Weight - 3/4" Sample (gm)	141.9	Weight of minus #200 material (gm)	202.44
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	141.90
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	5.97	1.7	1.7	98.3	**98.3**
#10	2.00	8.89	2.6	4.3	95.7	**95.7**
#20	0.850	11.15	3.2	7.6	92.4	**92.4**
#40	0.425	16.73	4.9	12.4	87.6	**87.6**
#60	0.250	20.81	6.0	18.5	81.5	**81.5**
#140	0.106	57.12	16.6	35.0	65.0	**65.0**
#200	0.075	21.23	6.2	41.2	58.8	**58.8**
Pan	-	202.44	58.8	100.0	-	-

Tested By SD Date 7/25/2008 Checked By GEM Date 7-30-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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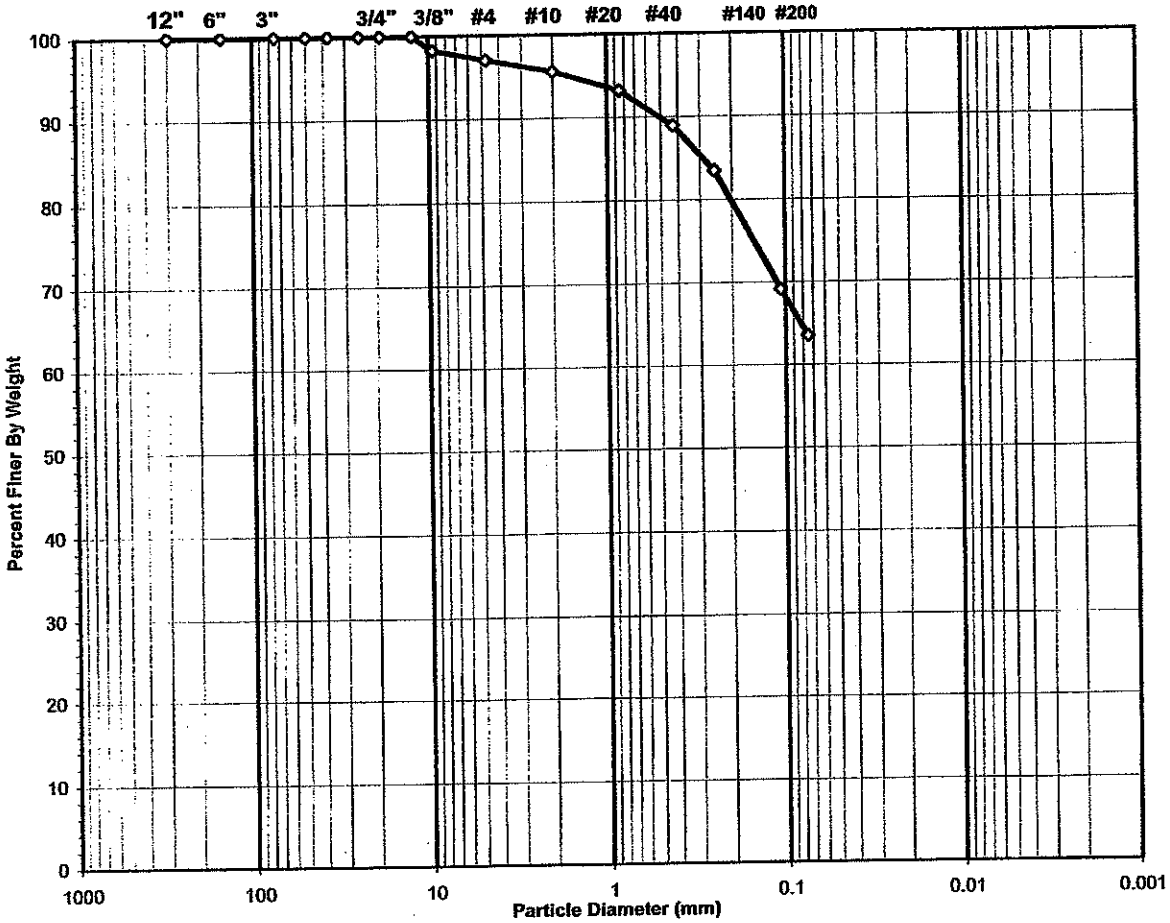
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO,INC.	Boring No.	IC8K
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-02	Sample No.	NA
Lab ID	2008-606-02-01	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By SD Date 7/31/2008 Checked By GM Date 8-1-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-02-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO,INC.	Boring No.	IC8K
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-02	Sample No.	NA
Lab ID	2008-606-02-01	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	200	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	626.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	563.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.70	Weight of Tare (gm)	NA
Weight of Water (gm)	62.20	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	392.10	Weight of Dry Soil (gm)	
Moisture Content (%)	**15.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	392.10
Dry Weight - 3/4" Sample (gm)	143.0	Weight of minus #200 material (gm)	249.13
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	142.97
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	6.82	1.7	1.7	98.3	**98.3**
#4	4.75	4.93	1.3	3.0	97.0	**97.0**
#10	2.00	5.78	1.5	4.5	95.5	**95.5**
#20	0.850	9.30	2.4	6.8	93.2	**93.2**
#40	0.425	16.86	4.3	11.1	88.9	**88.9**
#60	0.250	21.07	5.4	16.5	83.5	**83.5**
#140	0.106	56.32	14.4	30.9	69.1	**69.1**
#200	0.075	21.89	5.6	36.5	63.5	**63.5**
Pan	-	249.13	63.5	100.0	-	-

Tested By SD Date 7/31/2008 Checked By GEM Date 8-1-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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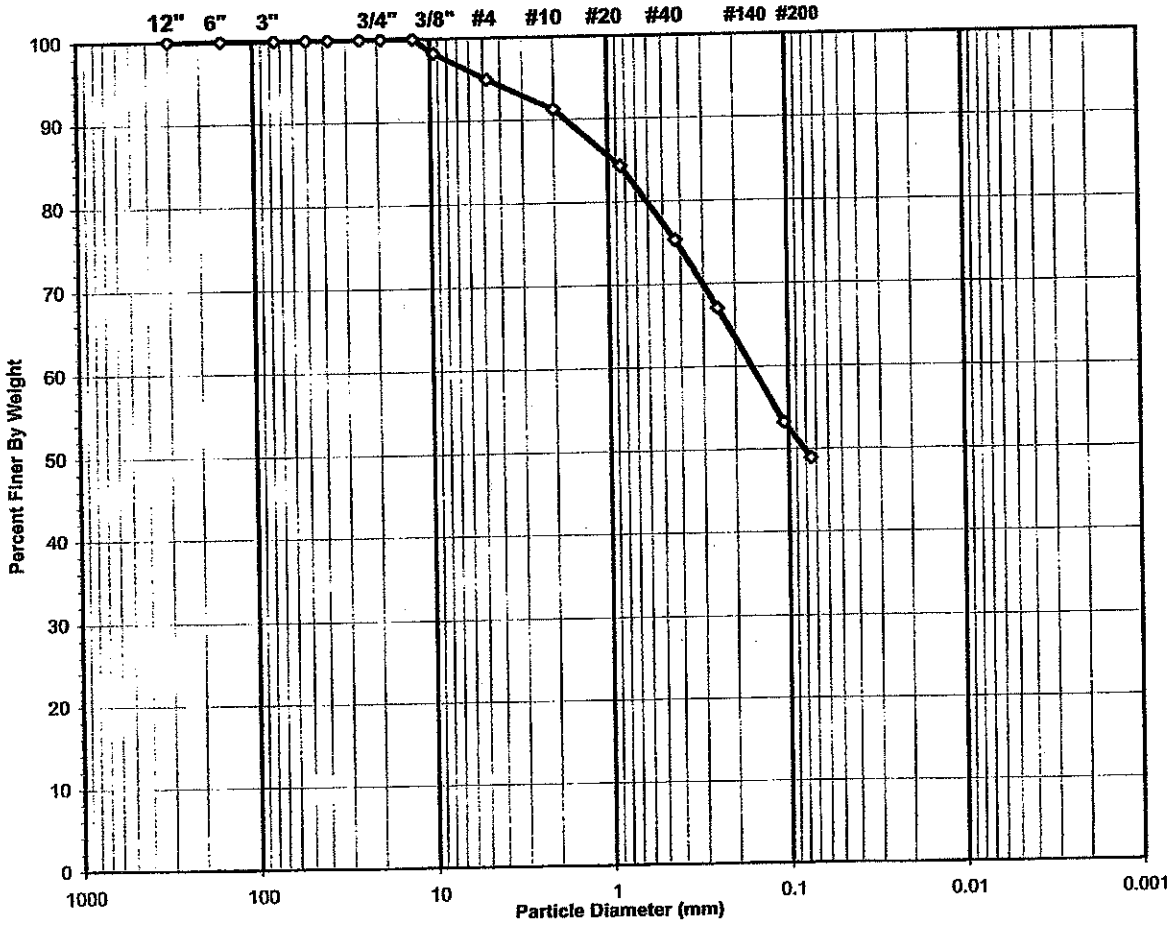
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-03	Sample No.	IC12-K
Lab ID	2008-606-03-01	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By TMS Date 8/5/2008 Checked By GBM Date 8-6-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-03-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-03	Sample No.	IC12-K
Lab ID	2008-606-03-01	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	201	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	704.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	616.74	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	170.66	Weight of Tare (gm)	NA
Weight of Water (gm)	87.66	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	446.08	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	446.08
Dry Weight - 3/4" Sample (gm)	227.9	Weight of minus #200 material (gm)	218.16
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	227.92
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	7.97	1.8	1.8	98.2	**98.2**
#4	4.75	14.45	3.2	5.0	95.0	**95.0**
#10	2.00	16.84	3.8	8.8	91.2	**91.2**
#20	0.850	30.70	6.9	15.7	84.3	**84.3**
#40	0.425	40.10	9.0	24.7	75.3	**75.3**
#60	0.250	36.91	8.3	32.9	67.1	**67.1**
#140	0.106	61.81	13.9	46.8	53.2	**53.2**
#200	0.075	19.14	4.3	51.1	48.9	**48.9**
Pan	-	218.16	48.9	100.0	-	-

Tested By TMS Date 8/5/2008 Checked By GBM Date 8-6-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
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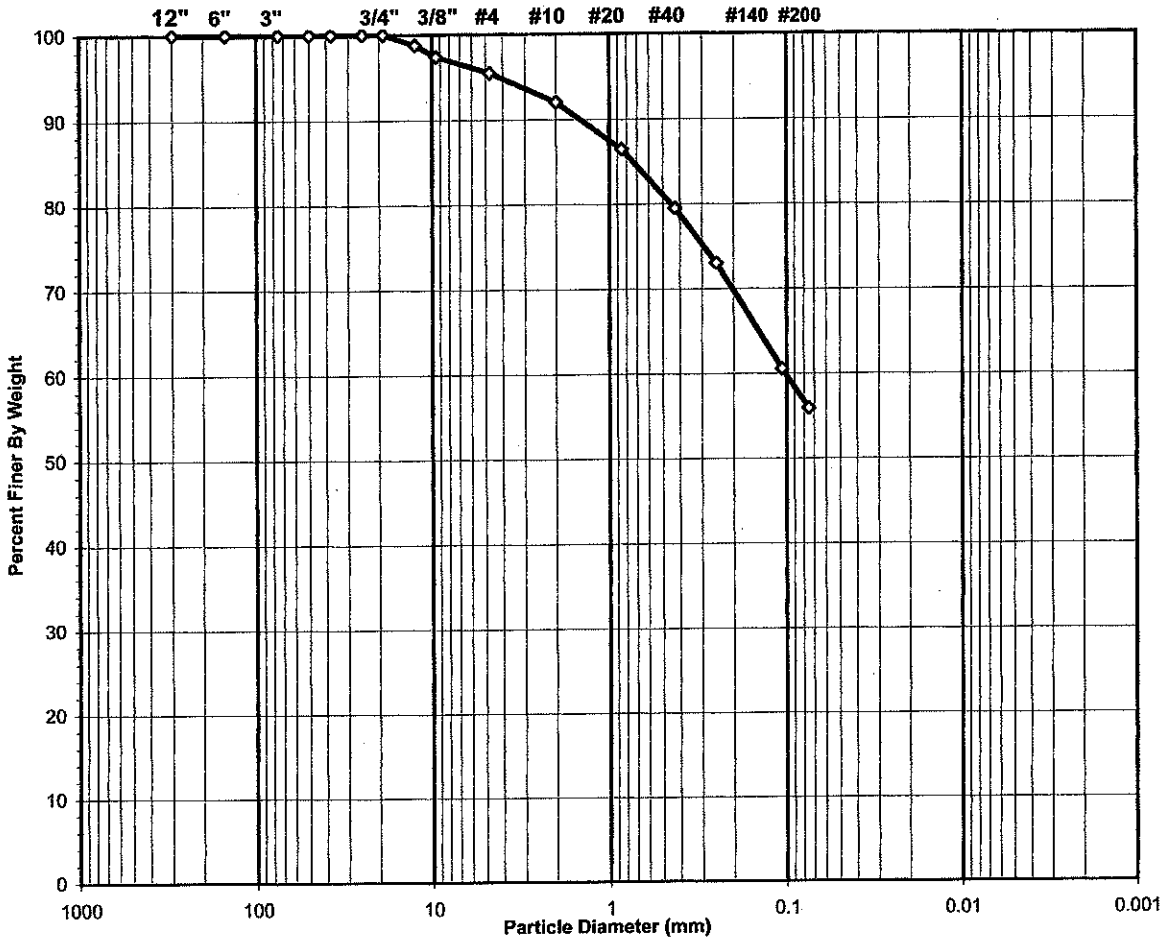
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC16K
Lab ID	2008-606-04-01	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By S.D. Date 8.15.08 Checked By GLM Date 8-18-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC16K
Lab ID	2008-606-04-01	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	213	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	777.20	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	699.79	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	173.23	Weight of Tare (gm)	NA
Weight of Water (gm)	77.41	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	526.56	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	526.56
Dry Weight - 3/4" Sample (gm)	232.3	Weight of minus #200 material (gm)	294.29
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	232.27
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	6.36	1.2	1.2	98.8	**98.8**
3/8"	9.50	7.21	1.4	2.6	97.4	**97.4**
#4	4.75	10.22	1.9	4.5	95.5	**95.5**
#10	2.00	18.14	3.4	8.0	92.0	**92.0**
#20	0.850	29.35	5.6	13.5	86.5	**86.5**
#40	0.425	36.69	7.0	20.5	79.5	**79.5**
#60	0.250	34.08	6.5	27.0	73.0	**73.0**
#140	0.106	65.80	12.5	39.5	60.5	**60.5**
#200	0.075	24.42	4.6	44.1	55.9	**55.9**
Pan	-	294.29	55.9	100.0	-	-

Tested By S.D. Date 8.15.08 Checked By GEM Date 8-18-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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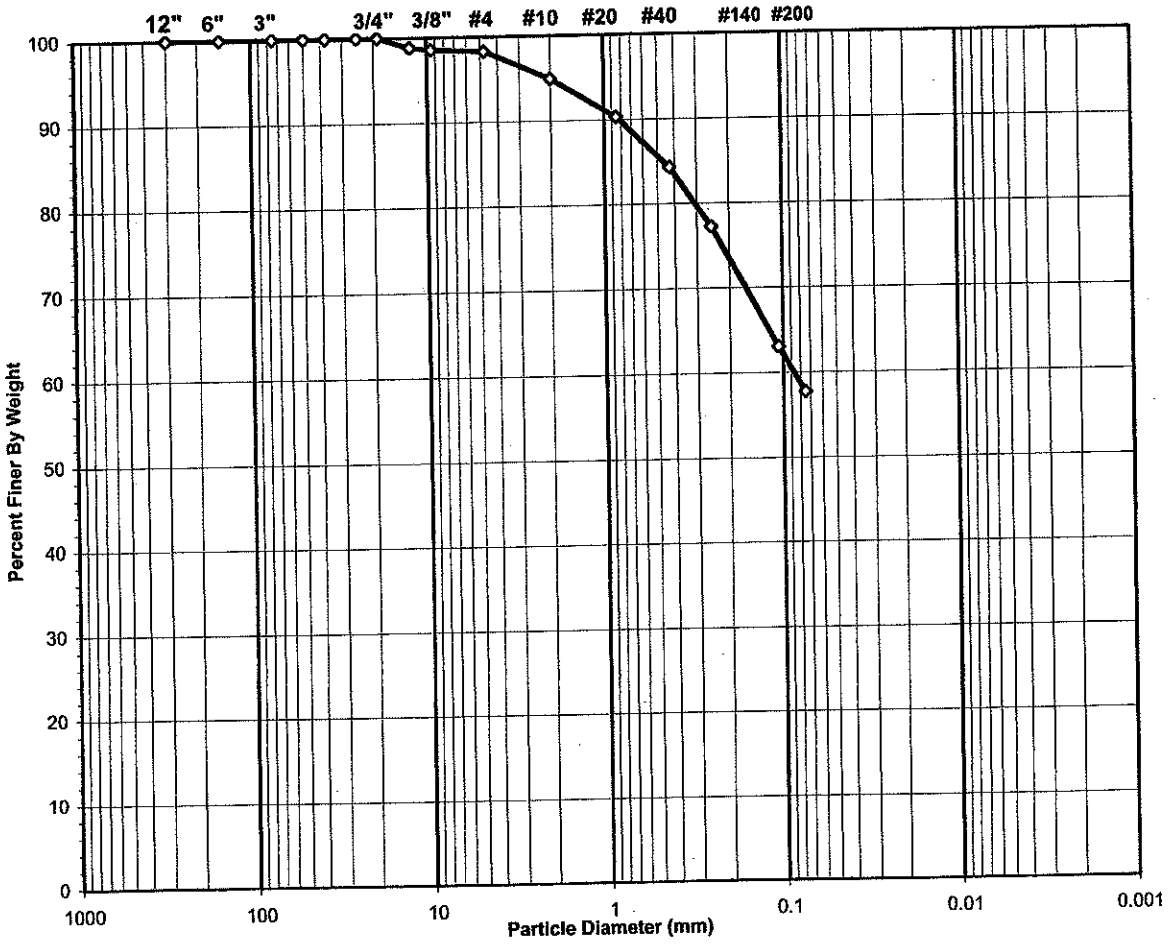
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC20K
Lab ID	2008-606-04-02	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By S.D. Date 8.15.08 Checked By GBM Date 8-20-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\ct\2008 PROJECTS\2008-606 THALLE\[2008-606-04-02 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC20K
Lab ID	2008-606-04-02	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	250	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	729.17	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	652.59	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	169.39	Weight of Tare (gm)	NA
Weight of Water (gm)	76.58	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	483.20	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	483.20
Dry Weight - 3/4" Sample (gm)	204.4	Weight of minus #200 material (gm)	278.82
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	204.38
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	5.62	1.2	1.2	98.8	**98.8**
3/8"	9.50	1.30	0.3	1.4	98.6	**98.6**
#4	4.75	1.36	0.3	1.7	98.3	**98.3**
#10	2.00	16.21	3.4	5.1	94.9	**94.9**
#20	0.850	22.25	4.6	9.7	90.3	**90.3**
#40	0.425	29.14	6.0	15.7	84.3	**84.3**
#60	0.250	34.10	7.1	22.8	77.2	**77.2**
#140	0.106	68.70	14.2	37.0	63.0	**63.0**
#200	0.075	25.70	5.3	42.3	57.7	**57.7**
Pan	-	278.82	57.7	100.0	-	-

Tested By S.D. Date 8.15.08 Checked By [signature] Date 8-20-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-04-02 SIEVON REV 4.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-01	Sample No.	IC-4K
Lab ID	2008-606-01-02	Soil Description	**DARK BROWN LEAN CLAY**

(Minus No. 40 sieve material, Airdried)

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.

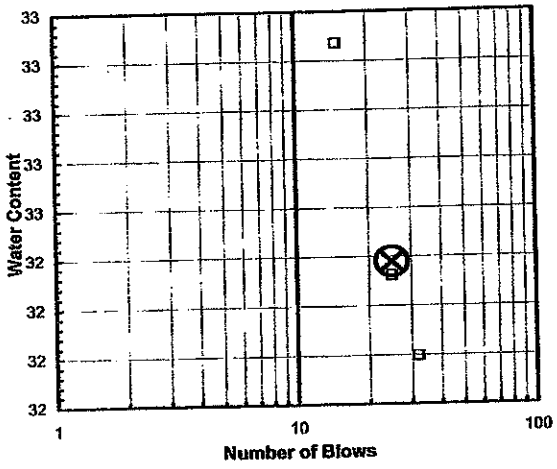
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	N	B	R	**MULTIPOINT**
Wt. of Tare & WS (gm)	29.33	29.17	27.32	
Wt. of Tare & DS (gm)	25.83	25.76	24.37	
Wt. of Tare (gm)	15.31	15.21	15.15	
Wt. of Water (gm)	3.5	3.4	3.0	
Wt. of DS (gm)	10.5	10.6	9.2	
Moisture Content (%)	**33.3**	**32.3**	**32.0**	
Number of Blows	**15**	**25**	**32**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	T	L	
Wt. of Tare & WS (gm)	22.61	22.36	
Wt. of Tare & DS (gm)	21.36	21.17	
Wt. of Tare (gm)	15.21	15.23	
Wt. of Water (gm)	1.3	1.2	
Wt. of DS (gm)	6.2	5.9	
Moisture Content (%)	**20.3**	**20.0**	**0.3**

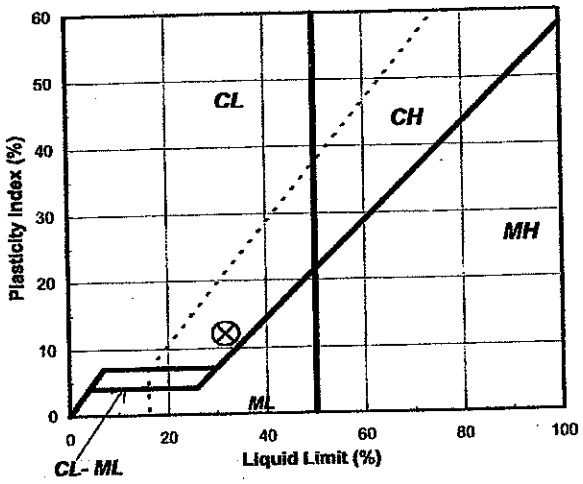
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**32**
Plastic Limit (%)	**20**
Plasticity Index (%)	**12**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 7/29/2008 *Checked By* GBM *Date* 7-30-08

page 1 of 1 DCN: CT-S4B DATE: 10/8/2001 REVISION: 2

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	IC8K
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-01	Sample No.	NA
Lab ID	2008-606-02-01	Soil Description	**DARK BROWN LEAN CLAY**

(Minus No. 40 sieve material, Airdried)

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.

Liquid Limit Test	**1**	**2**	**3**
Tare Number	A-N	A-B	A-K
Wt. of Tare & WS (gm)	29.70	28.39	26.56
Wt. of Tare & DS (gm)	26.35	25.47	24.09
Wt. of Tare (gm)	15.45	15.60	15.56
Wt. of Water (gm)	3.4	2.9	2.5
Wt. of DS (gm)	10.9	9.9	8.5
Moisture Content (%)	**30.7**	**29.6**	**29.0**
Number of Blows	**18**	**25**	**35**

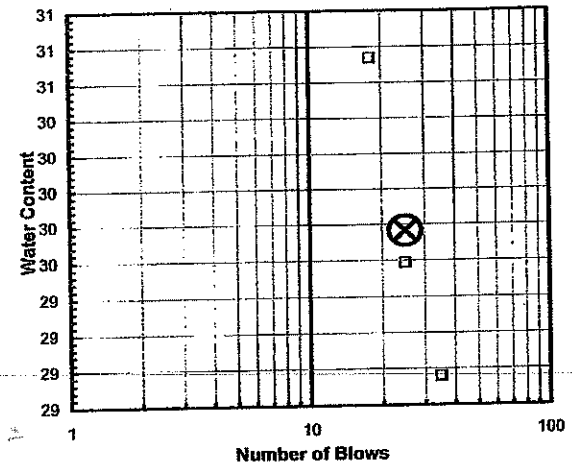
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-I	A-M	
Wt. of Tare & WS (gm)	24.19	22.68	
Wt. of Tare & DS (gm)	22.74	21.44	
Wt. of Tare (gm)	15.49	15.36	
Wt. of Water (gm)	1.5	1.2	
Wt. of DS (gm)	7.3	6.1	
Moisture Content (%)	**20.0**	**20.4**	**-0.4**

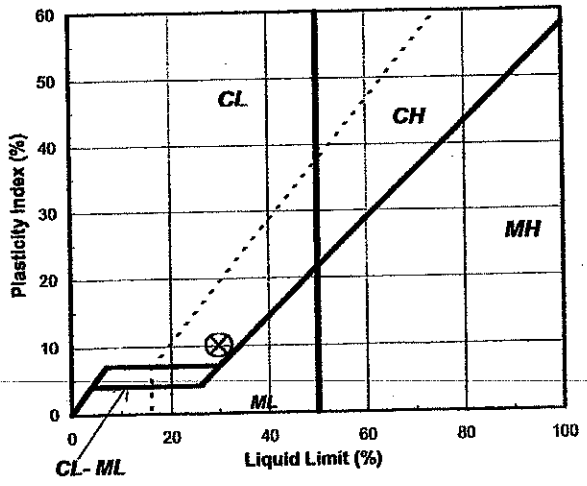
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**30**
Plastic Limit (%)	**20**
Plasticity Index (%)	**10**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-03	Sample No.	IC12-K
Lab ID	2008-606-03-01	Soil Description	**DARK BROWN LEAN CLAY**
			(Minus No. 40 sieve material, Airdried)

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.

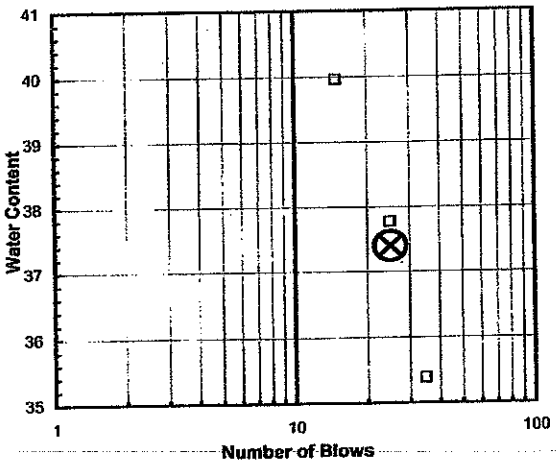
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	L	T	B	MULTIPOINT
Wt. of Tare & WS (gm)	28.81	29.39	33.22	
Wt. of Tare & DS (gm)	24.93	25.50	28.51	
Wt. of Tare (gm)	15.22	15.20	15.20	
Wt. of Water (gm)	3.9	3.9	4.7	
Wt. of DS (gm)	9.7	10.3	13.3	
Moisture Content (%)	**40.0**	**37.8**	**35.4**	
Number of Blows	**15**	**25**	**35**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	N	R	
Wt. of Tare & WS (gm)	21.72	21.61	
Wt. of Tare & DS (gm)	20.60	20.49	
Wt. of Tare (gm)	15.30	15.14	
Wt. of Water (gm)	1.1	1.1	
Wt. of DS (gm)	5.3	5.4	
Moisture Content (%)	**21.1**	**20.9**	**0.2**

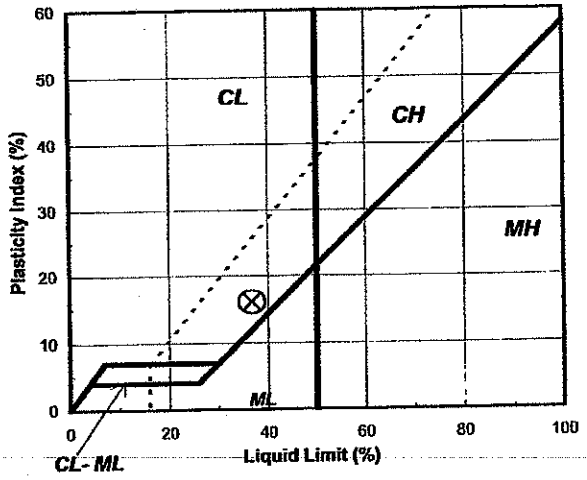
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**37**
Plastic Limit (%)	**21**
Plasticity Index (%)	**16**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	1C16K
Lab ID	2008-606-04-01	Soil Description	**DARK 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)

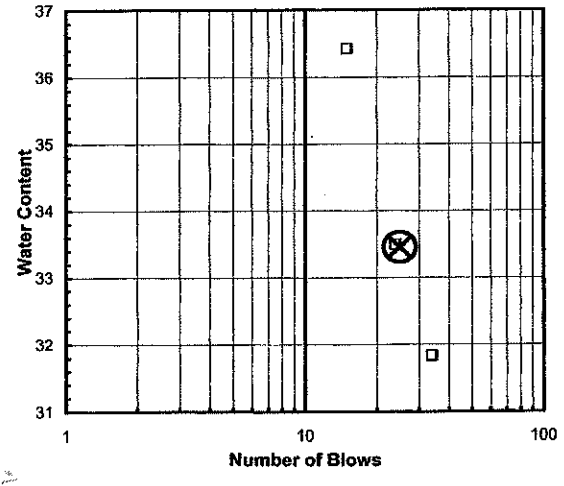
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	S	A	K	**U**
Wt. of Tare & WS (gm)	28.79	29.19	32.52	**L**
Wt. of Tare & DS (gm)	25.17	25.69	28.35	**T**
Wt. of Tare (gm)	15.23	15.24	15.25	**I**
Wt. of Water (gm)	3.6	3.5	4.2	**P**
Wt. of DS (gm)	9.9	10.5	13.1	**O**
				I
Moisture Content (%)	**36.4**	**33.5**	**31.8**	**N**
Number of Blows	**15**	**24**	**34**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	Y	A-P	
Wt. of Tare & WS (gm)	22.94	22.46	
Wt. of Tare & DS (gm)	21.79	21.41	
Wt. of Tare (gm)	15.61	15.58	
Wt. of Water (gm)	1.2	1.1	
Wt. of DS (gm)	6.2	5.8	
Moisture Content (%)	**18.6**	**18.0**	**0.6**

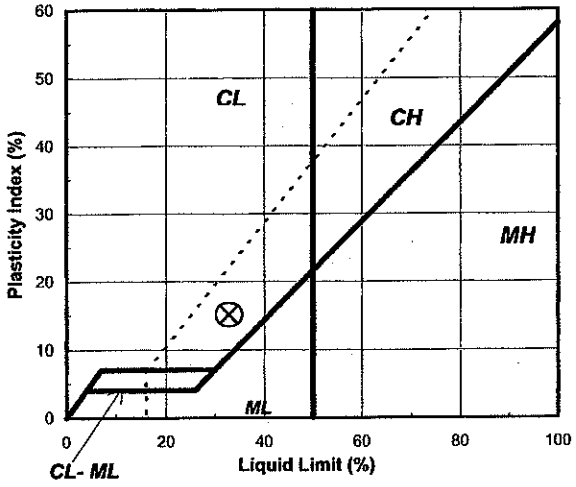
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**33**
Plastic Limit (%)	**18**
Plasticity Index (%)	**15**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	IC20K
Lab ID	2008-606-04-02	Soil Description	**DARK 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)

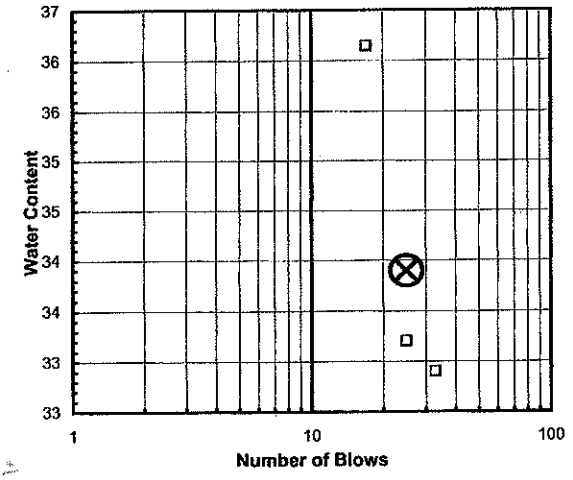
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	B	L	V	MULTIPOINT
Wt. of Tare & WS (gm)	26.51	28.50	28.58	
Wt. of Tare & DS (gm)	23.51	25.19	25.28	
Wt. of Tare (gm)	15.21	15.22	15.25	
Wt. of Water (gm)	3.0	3.3	3.3	
Wt. of DS (gm)	8.3	10.0	10.0	
Moisture Content (%)	**36.1**	**33.2**	**32.9**	
Number of Blows	**17**	**25**	**33**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	U	R	
Wt. of Tare & WS (gm)	23.12	22.10	
Wt. of Tare & DS (gm)	21.83	20.97	
Wt. of Tare (gm)	15.19	15.14	
Wt. of Water (gm)	1.3	1.1	
Wt. of DS (gm)	6.6	5.8	
Moisture Content (%)	**19.4**	**19.4**	**0.0**

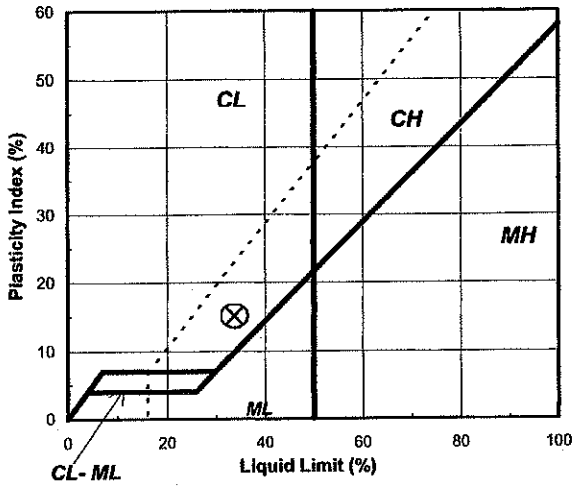
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**34**
Plastic Limit (%)	**19**
Plasticity Index (%)	**15**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 8/19/2008 *Checked By* GEM *Date* 8-20-08

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT
ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO. INC.
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2008-606-01

Lab ID	.002
Boring No.	NA
Depth (ft)	NA
Sample No.	IC-4K
Tare Number	200
Wt. of Tare & WS (gm)	575.3
Wt. of Tare & DS (gm)	516.29
Wt. of Tare (gm)	171.95
Wt. of Water (gm)	59.01
Wt. of DS (gm)	344.34
Water Content (%)	**17.1**

Notes : *NA*

Tested By SD *Date* 7/25/2008 *Checked By* GLM *Date* 7-29-08

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO MSW LF CLOSURE
Project No.	2008-606-02

Lab ID	.001
Boring No.	IC8K
Depth (ft)	NA
Sample No.	NA
Tare Number	200
Wt. of Tare & WS (gm)	626
Wt. of Tare & DS (gm)	563.8
Wt. of Tare (gm)	171.7
Wt. of Water (gm)	62.2
Wt. of DS (gm)	392.1
Water Content (%)	**15.9**

Notes : *NA*

Tested By SD *Date* 7/31/2008 *Checked By* [signature] *Date* 8-1-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2008-606-03

Lab ID	.001
Boring No.	NA
Depth (ft)	NA
Sample No.	IC12-K
Tare Number	303
Wt. of Tare & WS (gm)	673.6
Wt. of Tare & DS (gm)	578.61
Wt. of Tare (gm)	111.1
Wt. of Water (gm)	94.99
Wt. of DS (gm)	467.51
Water Content (%)	**20.3**

Notes : *NA*

Tested By *TMS* *Date* *8/3/2008* *Checked By* BEM *Date* 8-6-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

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APPENDIX A-3

Protective Cover Conformance Testing

Geotechnics
INTEGRITY IN TESTING

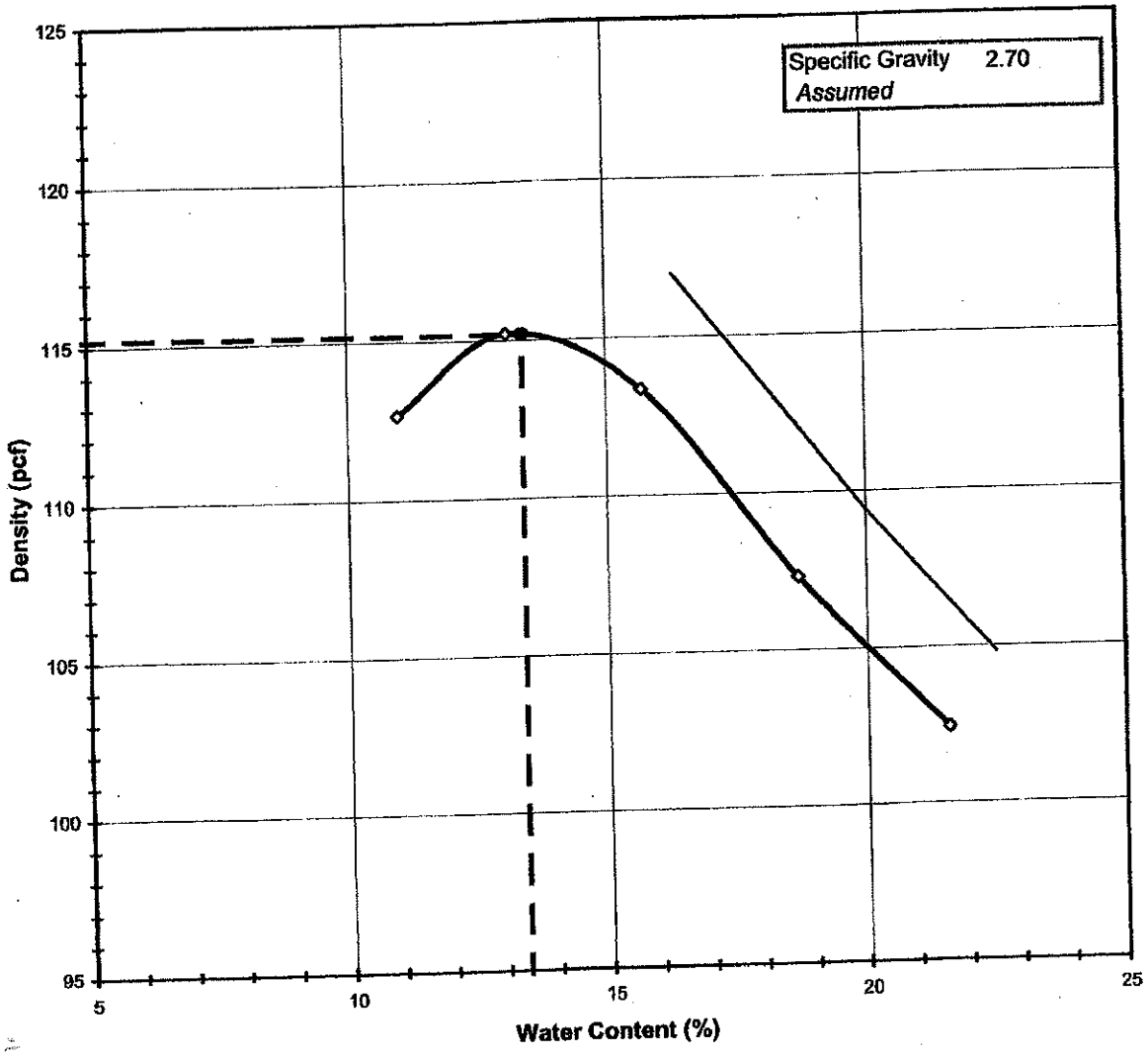
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC4K
Lab ID	2008-606-04-03	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content 13.4
Maximum Dry Density 115.2



Tested By SD *Date* 8/18/2008 *Checked By* GEM *Date* 8-20-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC4K
Lab ID	2008-606-04-03		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	23979
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	4
Percent Retained on 3/8"	9
Percent Retained on #4	12
Oversize Material	Not included
Procedure Used	B

TestType		STANDARD
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4324
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6202	6281	6294	6237	6195
Wt.of Mold (gm)	4324	4324	4324	4324	4324
Wt. of WS	1878	1957	1970	1913	1871
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	308	399	303	311	306
Wt. of Tare & WS (gm)	747.20	813.00	847.60	636.10	659.70
Wt. of Tare & DS (gm)	684.27	728.90	747.71	549.25	558.29
Wt. of Tare (gm)	110.60	86.30	110.80	84.10	88.30
Wt. of Water (gm)	62.93	84.10	99.89	86.85	101.41
Wt. of DS (gm)	573.67	642.60	636.91	465.15	469.99
Wet Density (gm/cc)	2.00	2.09	2.10	2.04	2.00
Wet Density (pcf)	125.0	130.3	131.1	127.4	124.5
Moisture Content (%)	**11.0**	**13.1**	**15.7**	**18.7**	**21.6**
Dry Density (pcf)	**112.7**	**115.2**	**113.3**	**107.3**	**102.4**

Zero Air Voids

Moisture Content (%)	16.3	20.0	22.5	
Dry Unit Weight (pcf)	117.0	109.4	104.8	

Tested By SD *Date* 8/18/2008 *Checked By* CEM *Date* 8-20-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-04-03 Proctor.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

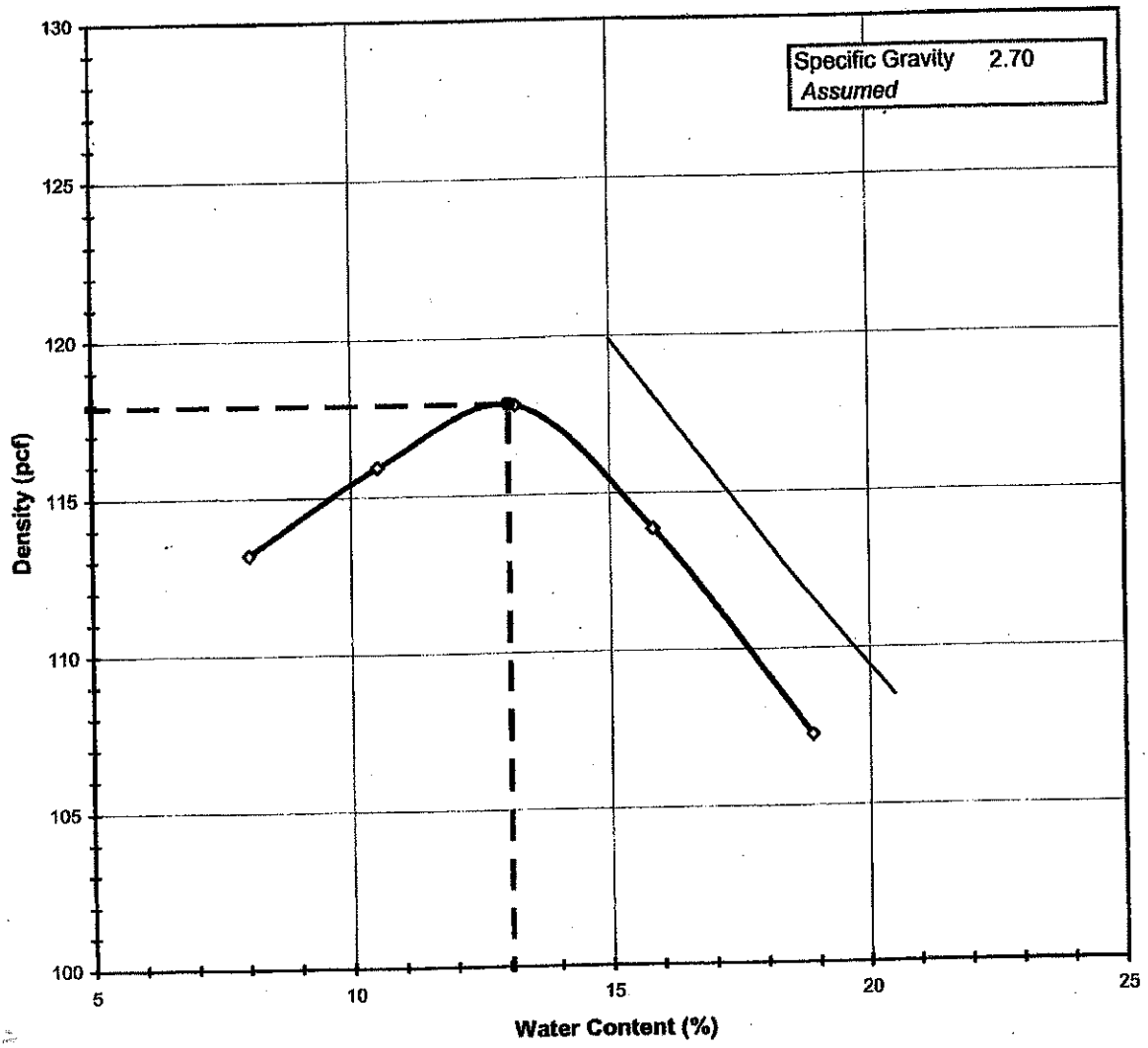
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC8K
Lab ID	2008-606-04-04	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content 13.1
Maximum Dry Density 117.9



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DCN:CT-S12 DATE:12/11/00 REVISION 6

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Geotechnic
INTEGRITY IN TEST

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC8K
Lab ID	2008-606-04-04		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	25137
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	4
Percent Retained on #4	6
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4325
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6161	6249	6328	6306	6239
Wt.of Mold (gm)	4325	4325	4325	4325	4325
Wt. of WS	1837	1924	2003	1981	1915
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	G-5	318	317	315	312
Wt. of Tare & WS (gm)	650.40	804.10	760.20	787.10	785.00
Wt. of Tare & DS (gm)	613.06	735.77	681.48	694.61	673.69
Wt. of Tare (gm)	147.60	86.30	84.30	110.30	84.30
Wt. of Water (gm)	37.34	68.33	78.72	92.49	111.31
Wt. of DS (gm)	465.46	649.47	597.18	584.31	589.39
Wet Density (gm/cc)	1.96	2.05	2.14	2.11	2.04
Wet Density (pcf)	122.3	128.1	133.4	131.9	127.5
Moisture Content (%)	**8.0**	**10.5**	**13.2**	**15.8**	**18.9**
Dry Density (pcf)	**113.2**	**115.9**	**117.8**	**113.9**	**107.2**

Zero Air Voids

Moisture Content (%)	15.0	18.5	20.5
Dry Unit Weight (pcf)	119.9	112.4	108.5

Tested By SD Date 8/18/2008 Checked By GEM Date 8-19-08

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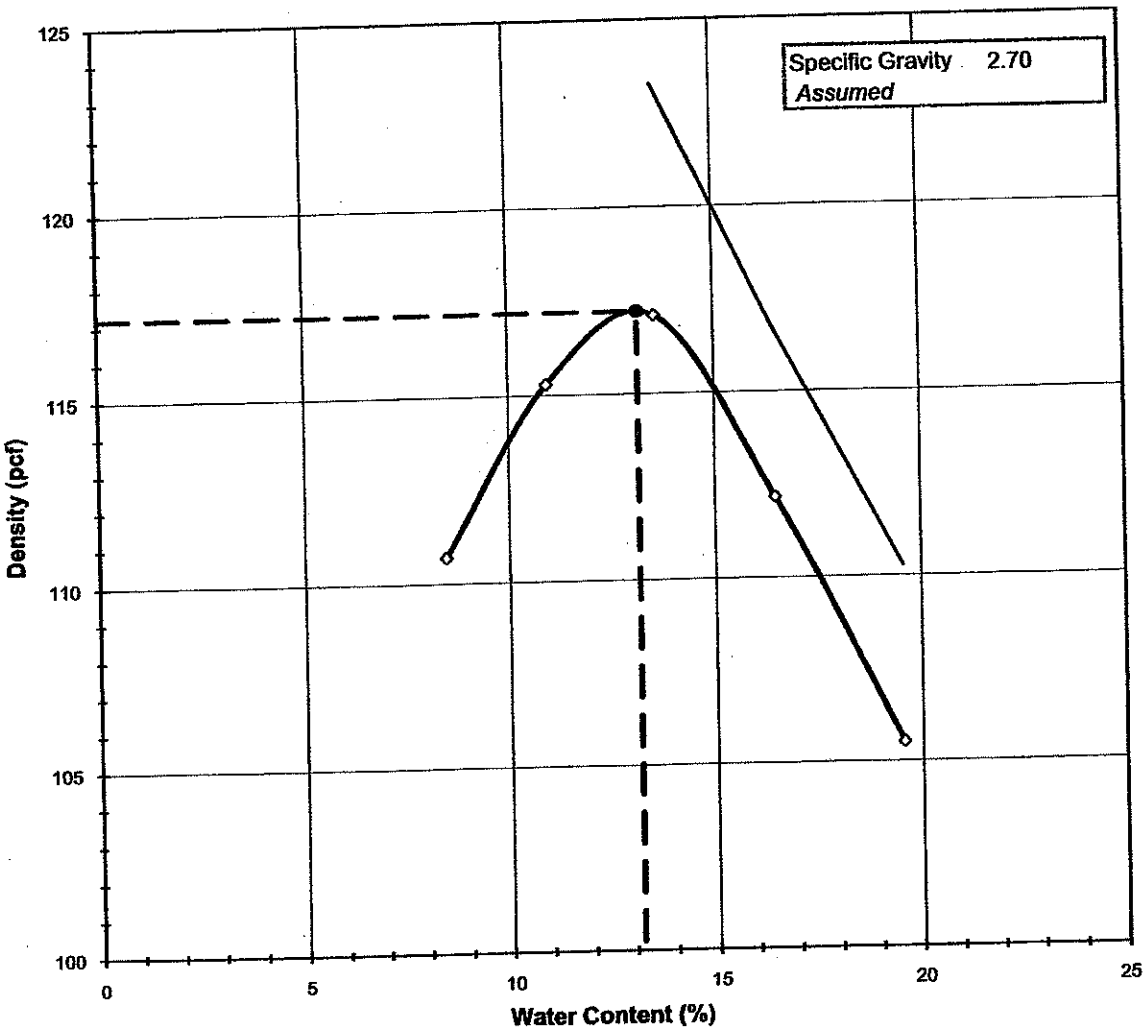
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC12K
Lab ID	2008-606-05-01	Test Method	**STANDARD**

Visual Description: DARK BROWN CLAYEY SAND

Optimum Water Content 13.2
Maximum Dry Density 117.2



Tested By SD *Date* 8/25/2008 *Checked By* JRB *Date* 8.28.08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC12K
Lab ID	2008-606-05-01		

Visual Description: DARK BROWN CLAYEY SAND

Total Weight of the Sample (gm)	22893
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	4
Percent Retained on #4	8
Oversize Material	Not included
Procedure Used	B

TestType	STANDARD
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4325
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6128	6246	6322	6286	6219
Wt.of Mold (gm)	4325	4325	4325	4325	4325
Wt. of WS	1803	1921	1998	1962	1895
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	398	306	300	399	303
Wt. of Tare & WS (gm)	718.30	730.00	634.90	722.60	794.80
Wt. of Tare & DS (gm)	668.96	666.74	572.27	632.73	682.94
Wt. of Tare (gm)	84.40	88.30	110.90	86.40	110.80
Wt. of Water (gm)	49.34	63.26	62.63	89.87	111.86
Wt. of DS (gm)	584.56	578.44	461.37	546.33	572.14
Wet Density (gm/cc)	1.92	2.05	2.13	2.09	2.02
Wet Density (pcf)	120.0	127.9	133.0	130.6	126.1
Moisture Content (%)	**8.4**	**10.9**	**13.6**	**16.4**	**19.6**
Dry Density (pcf)	**110.7**	**115.3**	**117.1**	**112.2**	**105.5**

Zero Air Voids

Moisture Content (%)	13.6	16.4	19.6
Dry Unit Weight (pcf)	123.3	116.7	110.3

Tested By SD *Date* 8/25/2008 *Checked By* JRB *Date* 8.28.08

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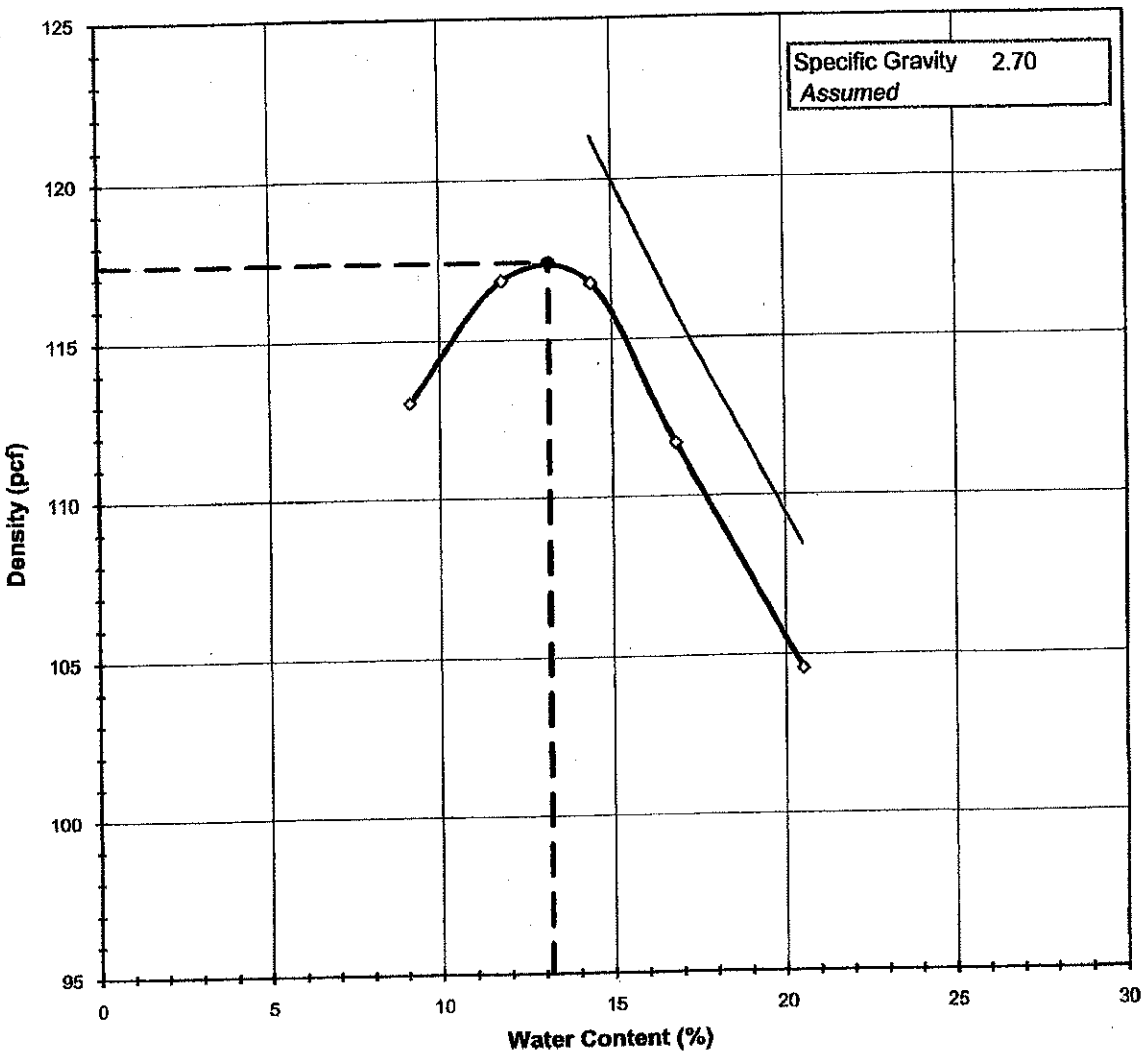
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC16K
Lab ID	2008-606-05-02	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY LEAN CLAY

Optimum Water Content 13.2
Maximum Dry Density 117.4



Tested By SD *Date* 8/25/2008 *Checked By* JPB *Date* 8.28.08

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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC16K
Lab ID	2008-606-05-02		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	21058
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	4
Percent Retained on #4	6
Oversize Material	Not included
Procedure Used	B

TestType	STANDARD
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4325
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6177	6286	6330	6284	6217
Wt.of Mold (gm)	4325	4325	4325	4325	4325
Wt. of WS	1853	1962	2006	1960	1893
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	311	305	300	317	315
Wt. of Tare & WS (gm)	709.00	671.20	704.90	684.00	763.30
Wt. of Tare & DS (gm)	656.80	609.28	630.13	597.52	652.16
Wt. of Tare (gm)	84.30	84.60	110.70	83.70	110.40
Wt. of Water (gm)	52.20	61.92	74.77	86.48	111.14
Wt. of DS (gm)	572.50	524.68	519.43	513.82	541.76
Wet Density (gm/cc)	1.98	2.09	2.14	2.09	2.02
Wet Density (pcf)	123.4	130.6	133.5	130.5	126.0
Moisture Content (%)	**9.1**	**11.8**	**14.4**	**16.8**	**20.5**
Dry Density (pcf)	**113.0**	**116.8**	**116.7**	**111.7**	**104.6**

Zero Air Voids

Moisture Content (%)	14.4	16.8	20.5
Dry Unit Weight (pcf)	121.3	115.8	108.4

Tested By SD *Date* 8/25/2008 *Checked By* JRB *Date* 8.28.08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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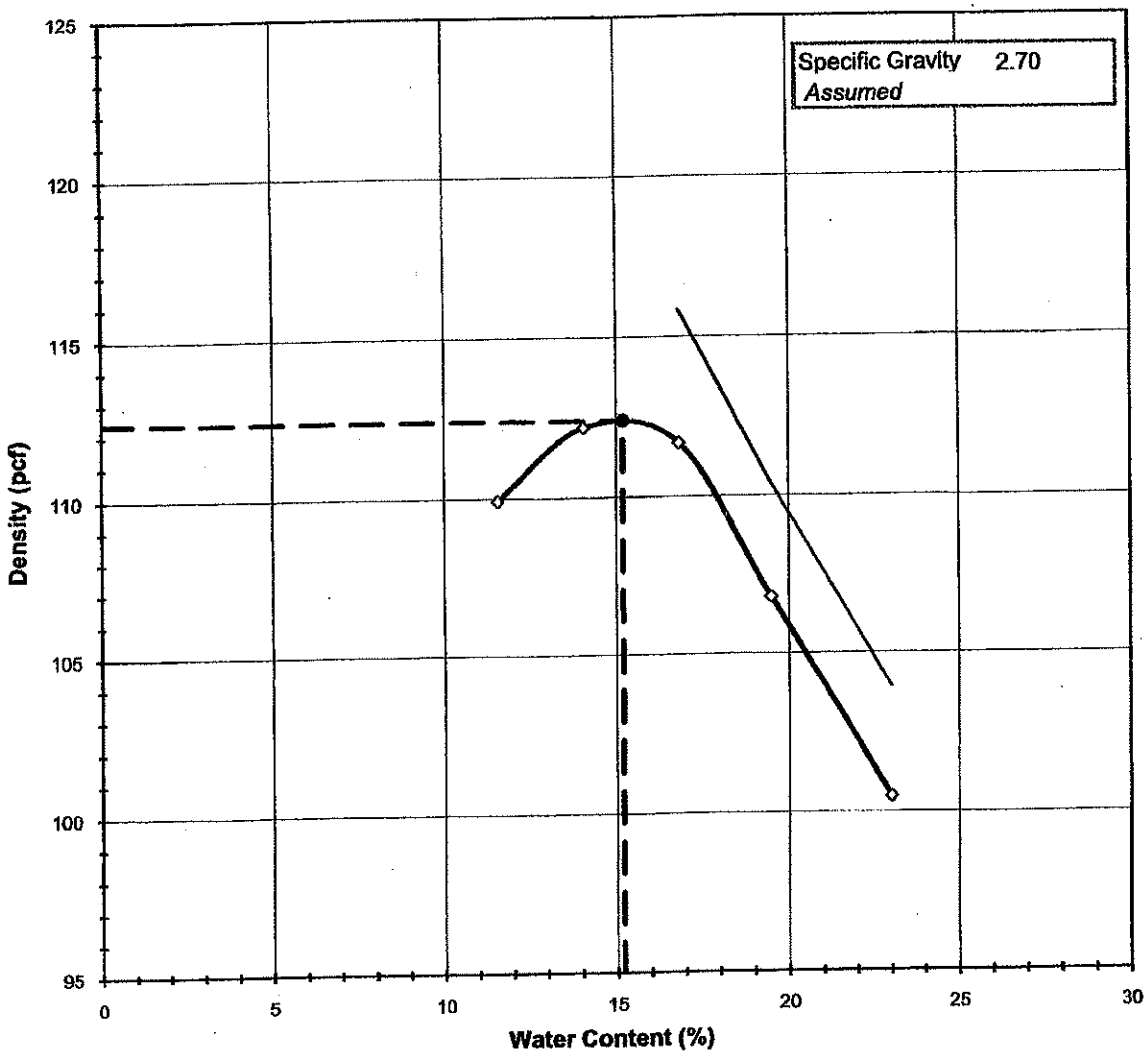
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC20K
Lab ID	2008-606-05-03	Test Method	**STANDARD**

Visual Description: RED BROWN SANDY LEAN CLAY

Optimum Water Content **15.2**
Maximum Dry Density **112.4**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC20K
Lab ID	2008-606-05-03		

Visual Description RED BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	21878
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	3
Percent Retained on 3/8"	5
Percent Retained on #4	7
Oversize Material	Not included
Procedure Used	B

TestType	**STANDARD**
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4325
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6166	6247	6284	6241	6181
Wt.of Mold (gm)	4325	4325	4325	4325	4325
Wt. of WS	1842	1922	1960	1917	1857
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	318	310	K-7	314	301
Wt. of Tare & WS (gm)	698.30	728.90	830.70	593.50	595.10
Wt. of Tare & DS (gm)	635.00	652.62	726.93	510.55	499.50
Wt. of Tare (gm)	86.80	110.30	110.30	85.00	84.00
Wt. of Water (gm)	63.30	76.28	103.77	82.95	95.60
Wt. of DS (gm)	548.20	542.32	616.63	425.55	415.50

Wet Density (gm/cc)	1.96	2.05	2.09	2.04	1.98
Wet Density (pcf)	122.6	128.0	130.5	127.6	123.6
Moisture Content (%)	**11.5**	**14.1**	**16.8**	**19.5**	**23.0**
Dry Density (pcf)	**109.9**	**112.2**	**111.7**	**106.8**	**100.5**

Zero Air Voids

Moisture Content (%)	16.8	19.5	23.0
Dry Unit Weight (pcf)	115.8	110.4	103.9

Tested By SD Date 8/26/2008 Checked By [illegible] Date [illegible]

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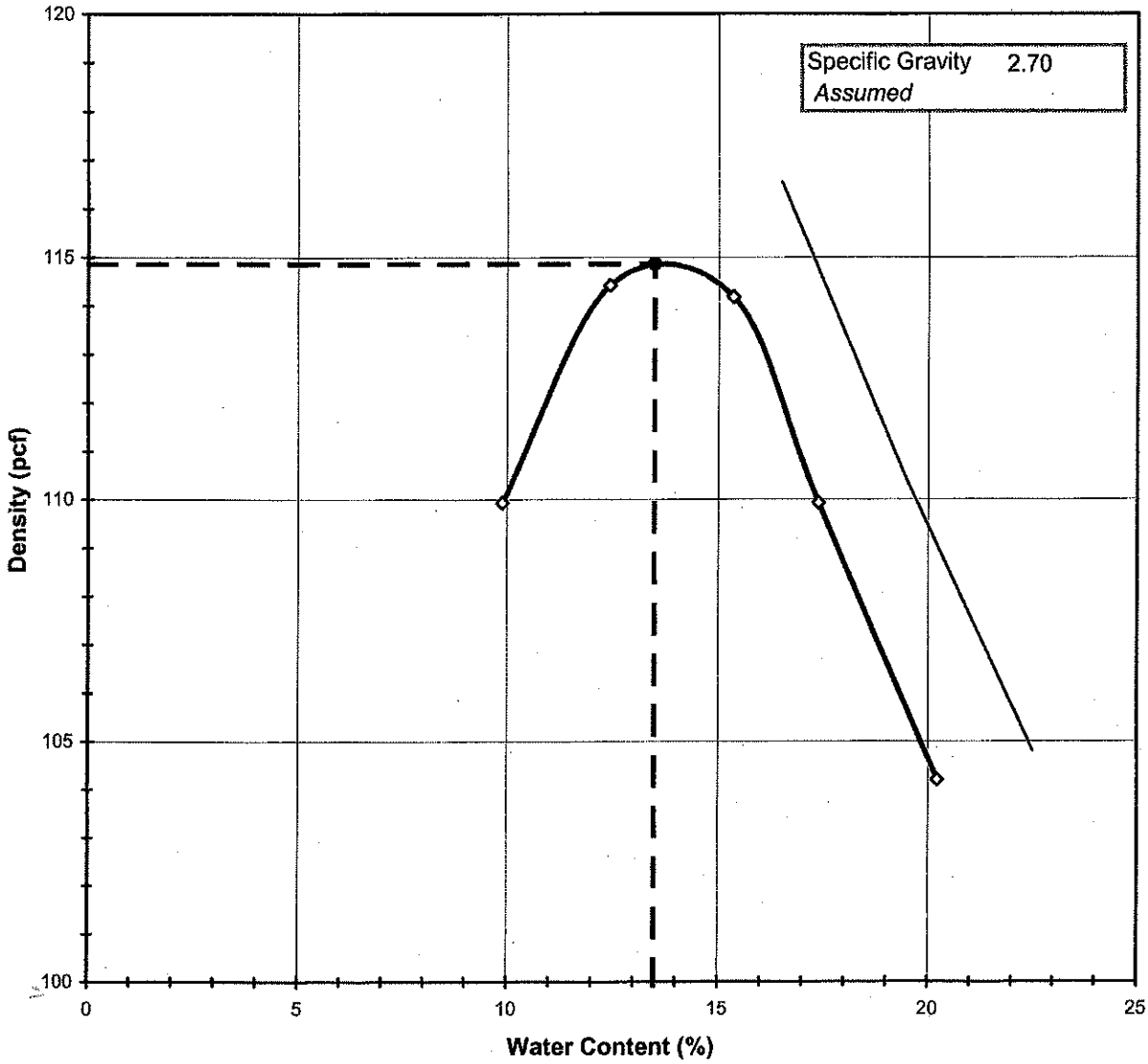
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC24K
Lab ID	2008-606-07-01	Test Method	**STANDARD**

Visual Description: DARK BROWN CLAYEY SAND

Optimum Water Content	**13.5**
Maximum Dry Density	**114.9**



Tested By SD *Date* 9/3/2008 *Checked By* Gam *Date* 9-4-08

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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC24K
Lab ID	2008-606-07-01		

Visual Description: DARK BROWN CLAYEY SAND

Total Weight of the Sample (gm)	21809
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	3
Percent Retained on 3/8"	6
Percent Retained on #4	9
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4324
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6139	6257	6303	6262	6206
Wt.of Mold (gm)	4324	4324	4324	4324	4324
Wt. of WS	1815	1932	1978	1938	1882
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	318	306	305	309	311
Wt. of Tare & WS (gm)	627.80	666.40	780.00	737.30	764.00
Wt. of Tare & DS (gm)	579.10	602.45	687.46	644.35	649.67
Wt. of Tare (gm)	86.80	88.30	84.70	109.60	84.40
Wt. of Water (gm)	48.70	63.95	92.54	92.95	114.33
Wt. of DS (gm)	492.30	514.15	602.76	534.75	565.27
Wet Density (gm/cc)	1.94	2.06	2.11	2.07	2.01
Wet Density (pcf)	120.8	128.6	131.7	129.0	125.3
Moisture Content (%)	**9.9**	**12.4**	**15.4**	**17.4**	**20.2**
Dry Density (pcf)	**109.9**	**114.4**	**114.2**	**109.9**	**104.2**

Zero Air Voids

Moisture Content (%)	16.5	19.5	22.5
Dry Unit Weight (pcf)	116.6	110.4	104.8

Tested By SD *Date* 9/3/2008 *Checked By* GBM *Date* 9-4-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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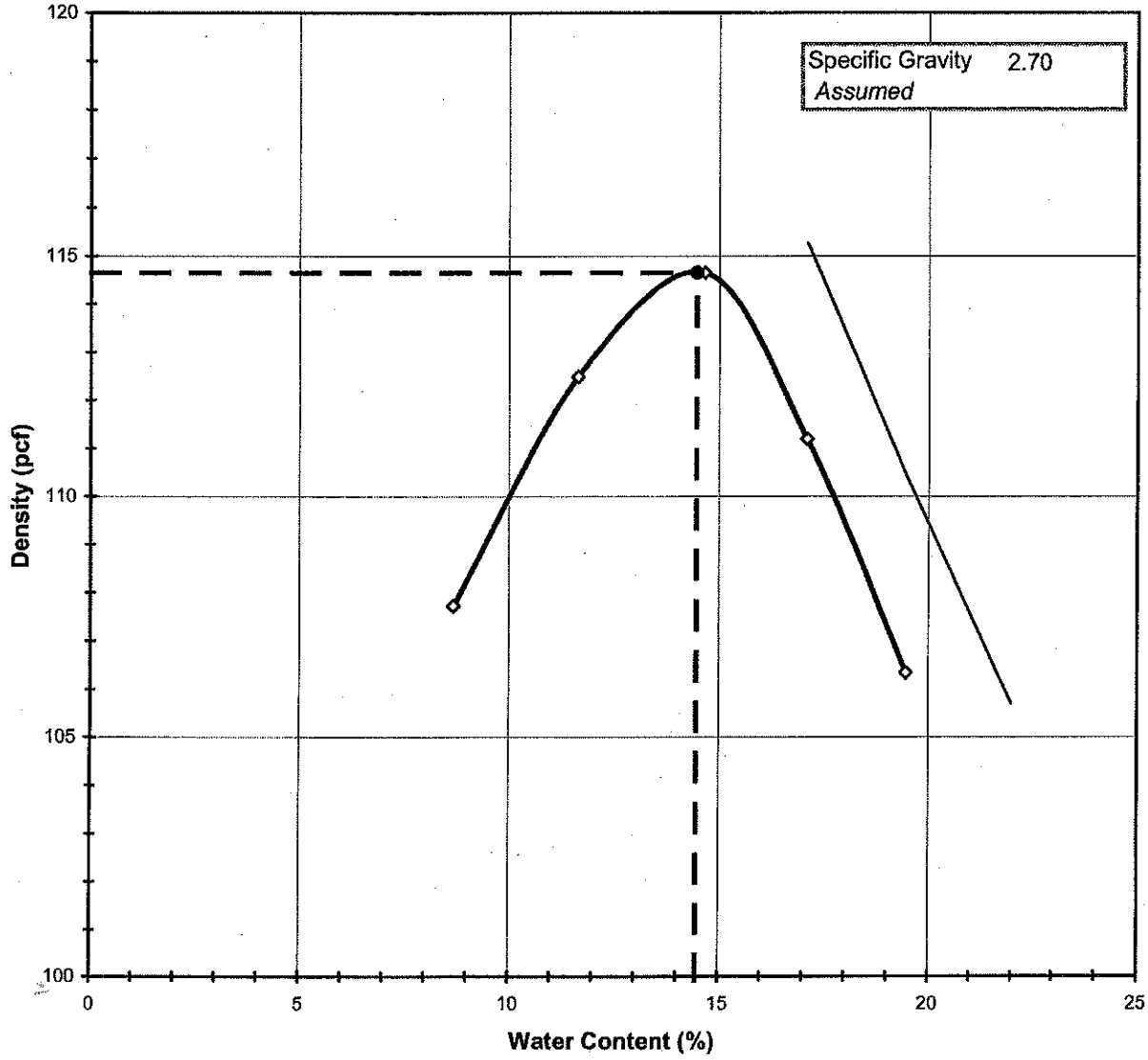
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC28K
Lab ID	2008-606-07-02	Test Method	**STANDARD**

Visual Description DARK BROWN SANDY LEAN CLAY

Optimum Water Content **14.5**
Maximum Dry Density **114.7**



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Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC28K
Lab ID	2008-606-07-02		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	22957
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	5
Percent Retained on #4	9
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4324
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6083	6211	6298	6280	6232
Wt.of Mold (gm)	4324	4324	4324	4324	4324
Wt. of WS	1759	1887	1974	1956	1908
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	314	K-7	301	310	303
Wt. of Tare & WS (gm)	592.80	740.20	744.60	745.50	736.60
Wt. of Tare & DS (gm)	552.14	674.46	660.17	652.70	634.62
Wt. of Tare (gm)	84.40	110.10	83.90	109.90	110.70
Wt. of Water (gm)	40.66	65.74	84.43	92.80	101.98
Wt. of DS (gm)	467.74	564.36	576.27	542.80	523.92

Wet Density (gm/cc)	1.88	2.01	2.11	2.09	2.04
Wet Density (pcf)	117.1	125.6	131.4	130.2	127.0
Moisture Content (%)	**8.7**	**11.6**	**14.7**	**17.1**	**19.5**
Dry Density (pcf)	**107.7**	**112.5**	**114.6**	**111.2**	**106.3**

Zero Air Voids

Moisture Content (%)	17.1	19.5	22.0
Dry Unit Weight (pcf)	115.3	110.4	105.7

Tested By SD *Date* 9/3/2008 *Checked By* GSM *Date* 9-4-08

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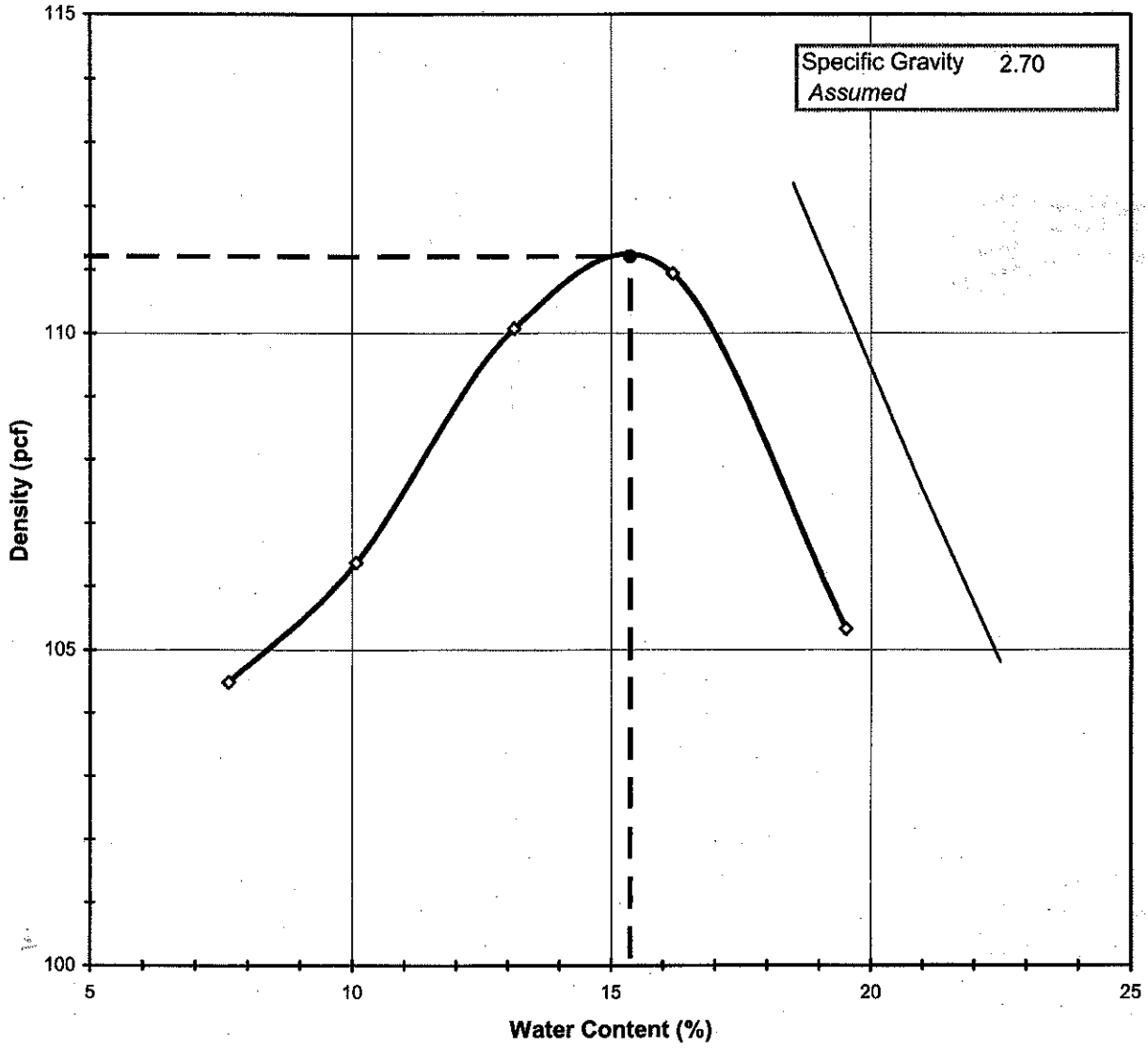
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE COMSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC32K
Lab ID	2008-606-08-01	Test Method	**STANDARD**

Visual Description DARK BROWN SANDY LEAN CLAY

Optimum Water Content **15.4**
Maximum Dry Density **111.2**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE COMSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC32K
Lab ID	2008-606-08-01		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	33661
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	2
Percent Retained on 3/8"	4
Percent Retained on #4	5
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4324
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6013	6083	6195	6260	6215
Wt.of Mold (gm)	4324	4324	4324	4324	4324
Wt. of WS	1689	1759	1871	1936	1891
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	399	398	306	303	309
Wt. of Tare & WS (gm)	601.20	620.90	811.10	754.00	653.20
Wt. of Tare & DS (gm)	564.69	571.76	727.19	664.37	564.35
Wt. of Tare (gm)	86.40	84.10	88.00	110.70	109.00
Wt. of Water (gm)	36.51	49.14	83.91	89.63	88.85
Wt. of DS (gm)	478.29	487.66	639.19	553.67	455.35
Wet Density (gm/cc)	1.80	1.88	2.00	2.07	2.02
Wet Density (pcf)	112.5	117.1	124.5	128.9	125.9
Moisture Content (%)	**7.6**	**10.1**	**13.1**	**16.2**	**19.5**
Dry Density (pcf)	**104.5**	**106.4**	**110.1**	**110.9**	**105.3**

Zero Air Voids

Moisture Content (%)	18.5	21.0	22.5
Dry Unit Weight (pcf)	112.4	107.5	104.8

Tested By SD *Date* 9/9/2008 *Checked By* BM *Date* 9-12-08

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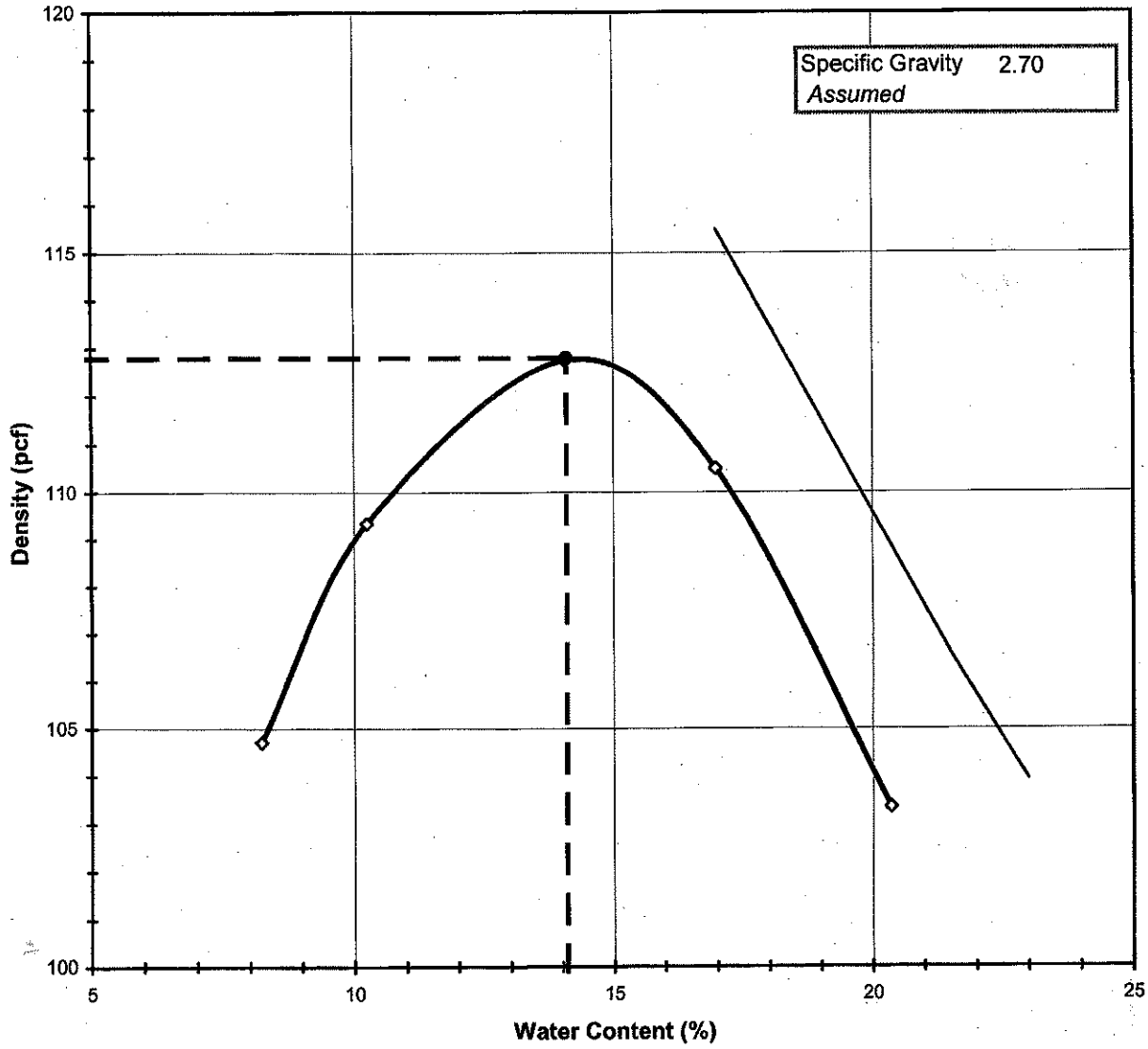
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE COMSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC36K
Lab ID	2008-606-08-02	Test Method	**STANDARD**

Visual Description: DARK BROWN SANDY SILT

Optimum Water Content **14.1**
Maximum Dry Density **112.8**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE COMSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC36K
Lab ID	2008-606-08-02		

Visual Description: DARK BROWN SANDY SILT

Total Weight of the Sample (gm)	31895
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	3
Percent Retained on 3/8"	6
Percent Retained on #4	7
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4324
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6026	6135	6256	6266	6192
Wt.of Mold (gm)	4324	4324	4324	4324	4324
Wt. of WS	1702	1811	1932	1941	1868
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	K-7	310	311	301	314
Wt. of Tare & WS (gm)	723.20	643.60	634.80	670.70	660.30
Wt. of Tare & DS (gm)	676.63	594.03	566.89	585.57	562.86
Wt. of Tare (gm)	110.70	110.20	84.10	84.10	84.00
Wt. of Water (gm)	46.57	49.57	67.91	85.13	97.44
Wt. of DS (gm)	565.93	483.83	482.79	501.47	478.86

Wet Density (gm/cc)	1.82	1.93	2.06	2.07	1.99
Wet Density (pcf)	113.3	120.5	128.6	129.2	124.4
Moisture Content (%)	**8.2**	**10.2**	**14.1**	**17.0**	**20.3**
Dry Density (pcf)	**104.7**	**109.3**	**112.7**	**110.5**	**103.3**

Zero Air Voids

Moisture Content (%)	17.0	21.5	23.0
Dry Unit Weight (pcf)	115.5	106.6	103.9

Tested By SD *Date* 9/9/2008 *Checked By* GBM *Date* 9-10-08

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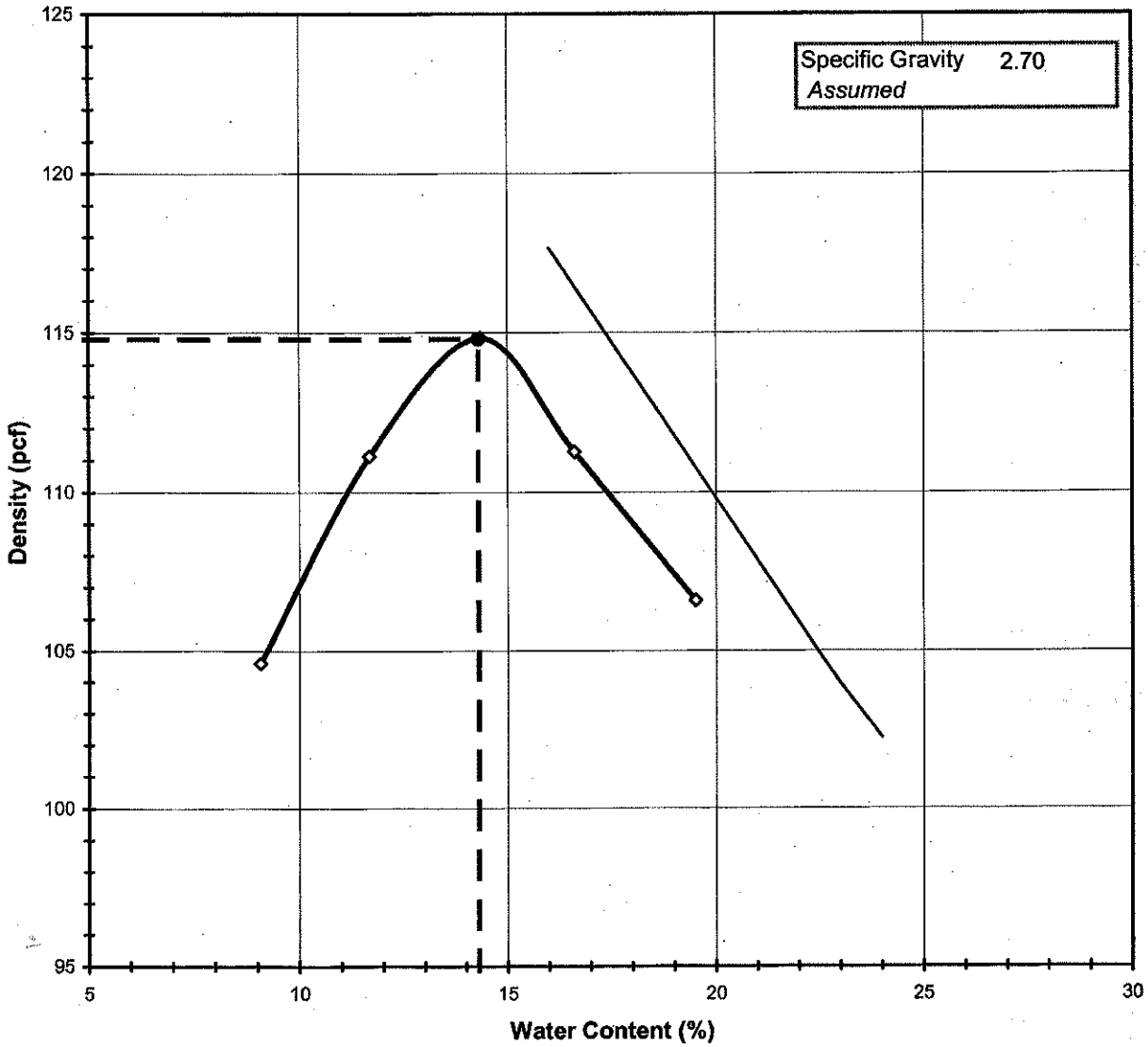
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-09	Sample No.	PC-40K
Lab ID	2008-606-09-01	Test Method	**STANDARD**

Visual Description DARK BROWN SANDY LEAN CLAY

Optimum Water Content **14.3**
Maximum Dry Density **114.8**



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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-09	Sample No.	PC-40K
Lab ID	2008-606-09-01		

Visual Description: DARK BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	19508
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	1
Percent Retained on 3/8"	NA
Percent Retained on #4	5
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4324
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6037	6188	6296	6273	6237
Wt.of Mold (gm)	4324	4324	4324	4324	4324
Wt. of WS	1714	1864	1972	1949	1913
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	312	307	303	304	399
Wt. of Tare & WS (gm)	627.90	643.40	636.90	861.10	639.60
Wt. of Tare & DS (gm)	582.68	587.76	570.92	754.21	549.28
Wt. of Tare (gm)	84.40	111.00	111.10	110.90	86.40
Wt. of Water (gm)	45.22	55.64	65.98	106.89	90.32
Wt. of DS (gm)	498.28	476.76	459.82	643.31	462.88
Wet Density (gm/cc)	1.83	1.99	2.10	2.08	2.04
Wet Density (pcf)	114.1	124.1	131.3	129.7	127.4
Moisture Content (%)	**9.1**	**11.7**	**14.3**	**16.6**	**19.5**
Dry Density (pcf)	**104.6**	**111.1**	**114.8**	**111.3**	**106.6**

Zero Air Voids

Moisture Content (%)	16.0	23.0	24.0
Dry Unit Weight (pcf)	117.7	103.9	102.2

Tested By SD *Date* 9/10/2008 *Checked By* GBM *Date* 9-22-08

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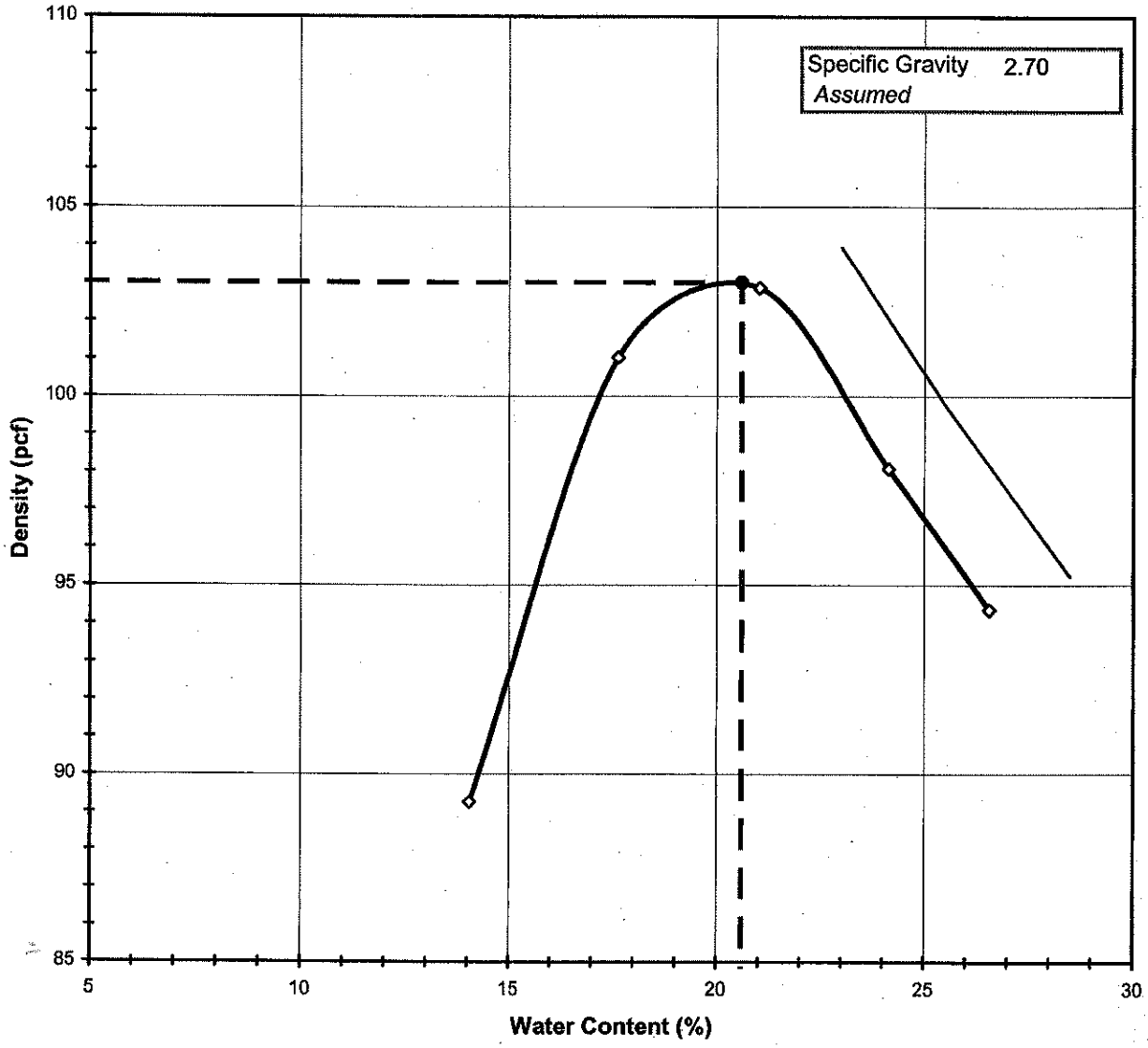
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	2
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-02	Test Method	**STANDARD**

Visual Description: BROWN SANDY LEAN CLAY

Optimum Water Content **20.6**
Maximum Dry Density **103.0**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	2
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-02		

Visual Description: BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	6
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not Included
Procedure Used	C

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	173
Mold diameter		6"
Weight of the Mold		5561
Volume of the Mold(cc)		2120

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	9020	9599	9791	9697	9618
Wt.of Mold (gm)	5561	5561	5561	5561	5561
Wt. of WS	3459	4038	4230	4137	4057
Mold Volume (cc)	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number	208	214	304	306	311
Wt. of Tare & WS (gm)	801.30	832.10	802.70	464.80	899.20
Wt. of Tare & DS (gm)	723.54	733.06	682.49	391.58	728.23
Wt. of Tare (gm)	170.00	171.50	110.80	88.30	84.70
Wt. of Water (gm)	77.76	99.04	120.21	73.22	170.97
Wt. of DS (gm)	553.54	561.56	571.69	303.28	643.53
Wet Density (gm/cc)	1.63	1.90	2.00	1.95	1.91
Wet Density (pcf)	101.8	118.9	124.5	121.7	119.4
Moisture Content (%)	**14.0**	**17.6**	**21.0**	**24.1**	**26.6**
Dry Density (pcf)	**89.3**	**101.0**	**102.9**	**98.1**	**94.3**

Zero Air Voids

Moisture Content (%)	23.0	25.5	28.5
Dry Unit Weight (pcf)	103.9	99.8	95.2

Tested By SD *Date* 10/13/2008 *Checked By* GEM *Date* 10-14-08

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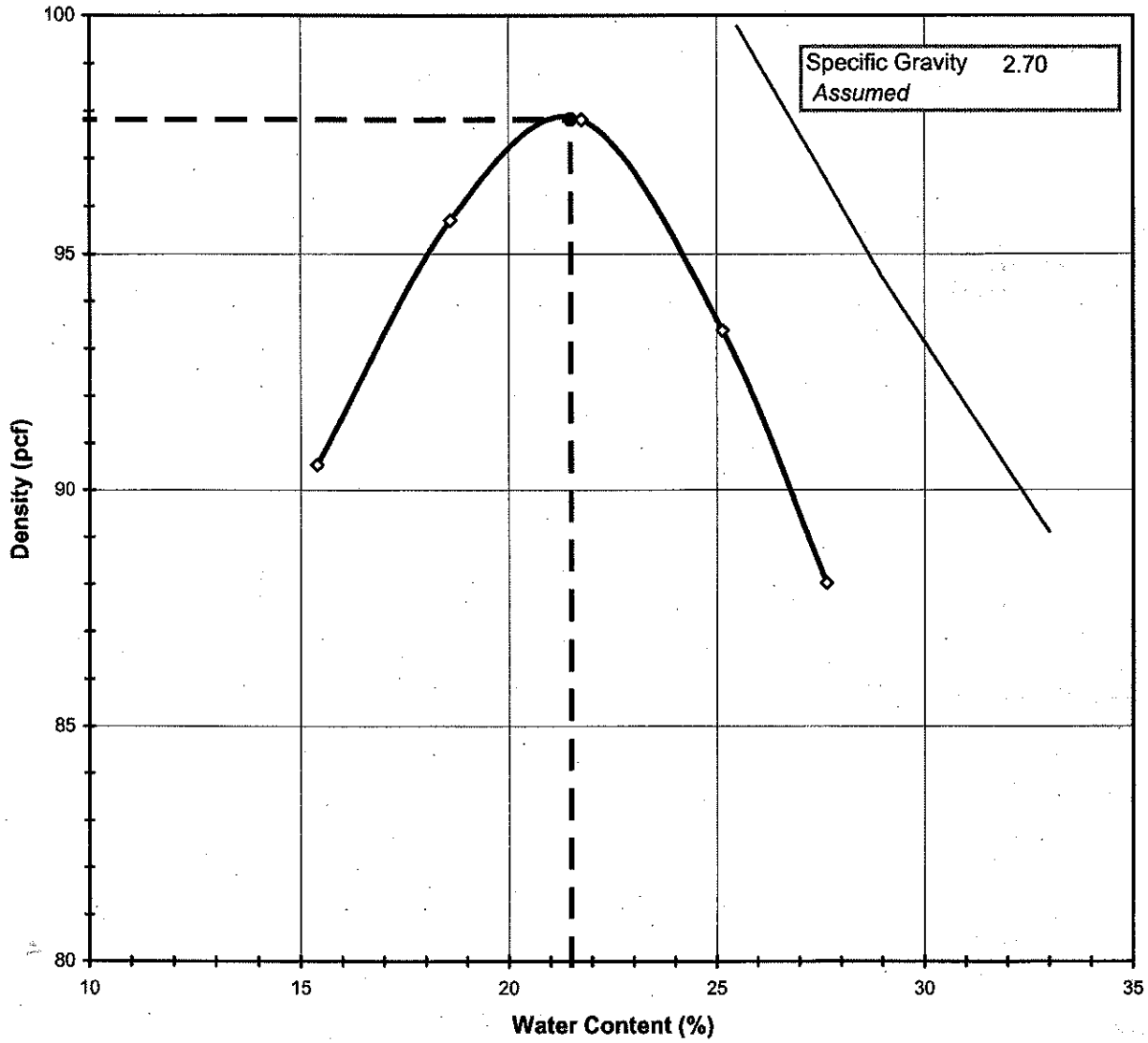
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	3
Client Reference	NORTH WAKE CO. MSW LF CLOSUI	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-03	Test Method	**STANDARD**

Visual Description TAN SILTY SAND

Optimum Water Content	**21.5**
Maximum Dry Density	**97.8**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	3
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-03		

Visual Description TAN SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5892	6028	6112	6078	6010
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1569	1705	1789	1755	1687
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	308	398	311	203	215
Wt. of Tare & WS (gm)	621.80	460.00	531.50	533.80	546.10
Wt. of Tare & DS (gm)	553.64	401.03	451.53	461.13	465.11
Wt. of Tare (gm)	110.90	83.90	84.00	172.10	172.11
Wt. of Water (gm)	68.16	58.97	79.97	72.67	80.99
Wt. of DS (gm)	442.74	317.13	367.53	289.03	293.00
Wet Density (gm/cc)	1.67	1.82	1.91	1.87	1.80
Wet Density (pcf)	104.5	113.5	119.1	116.9	112.3
Moisture Content (%)	**15.4**	**18.6**	**21.8**	**25.1**	**27.6**
Dry Density (pcf)	**90.5**	**95.7**	**97.8**	**93.4**	**88.0**

Zero Air Voids

Moisture Content (%)	25.5	29.0	33.0
Dry Unit Weight (pcf)	99.8	94.5	89.1

Tested By SD *Date* 10/10/2008 *Checked By* GBM *Date* 10-13-08

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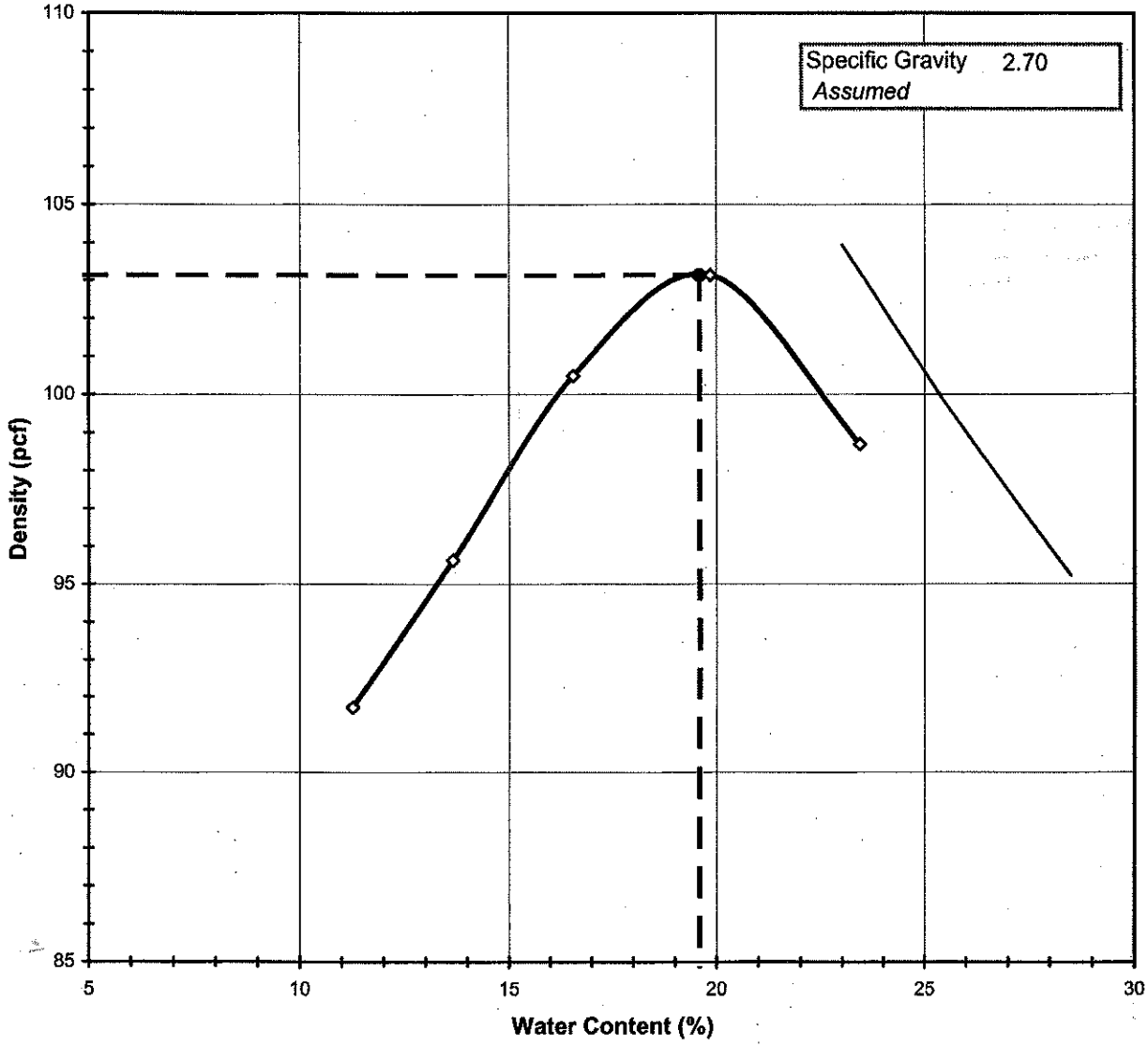
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	4
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-04	Test Method	**STANDARD**

Visual Description: BROWN SANDY LEAN CLAY

Optimum Water Content **19.6**
Maximum Dry Density **103.1**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	4
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-04		

Visual Description: BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	C

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	173
Mold diameter		6"
Weight of the Mold		5561
Volume of the Mold(cc)		2120

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	9028	9253	9540	9761	9700
Wt.of Mold (gm)	5561	5561	5561	5561	5561
Wt. of WS	3467	3693	3980	4200	4139
Mold Volume (cc)	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number	304	310	G-3	315	309
Wt. of Tare & WS (gm)	728.10	682.20	708.30	808.60	675.90
Wt. of Tare & DS (gm)	665.58	613.48	628.64	693.04	568.47
Wt. of Tare (gm)	110.50	110.10	147.40	110.90	110.00
Wt. of Water (gm)	62.52	68.72	79.66	115.56	107.43
Wt. of DS (gm)	555.08	503.38	481.24	582.14	458.47

Wet Density (gm/cc)	1.64	1.74	1.88	1.98	1.95
Wet Density (pcf)	102.0	108.7	117.1	123.6	121.8
Moisture Content (%)	**11.3**	**13.7**	**16.6**	**19.9**	**23.4**
Dry Density (pcf)	**91.7**	**95.6**	**100.5**	**103.1**	**98.7**

Zero Air Voids

Moisture Content (%)	23.0	25.5	28.5
Dry Unit Weight (pcf)	103.9	99.8	95.2

Tested By SD *Date* 10/13/2008 *Checked By* GBM *Date* 10-14-08

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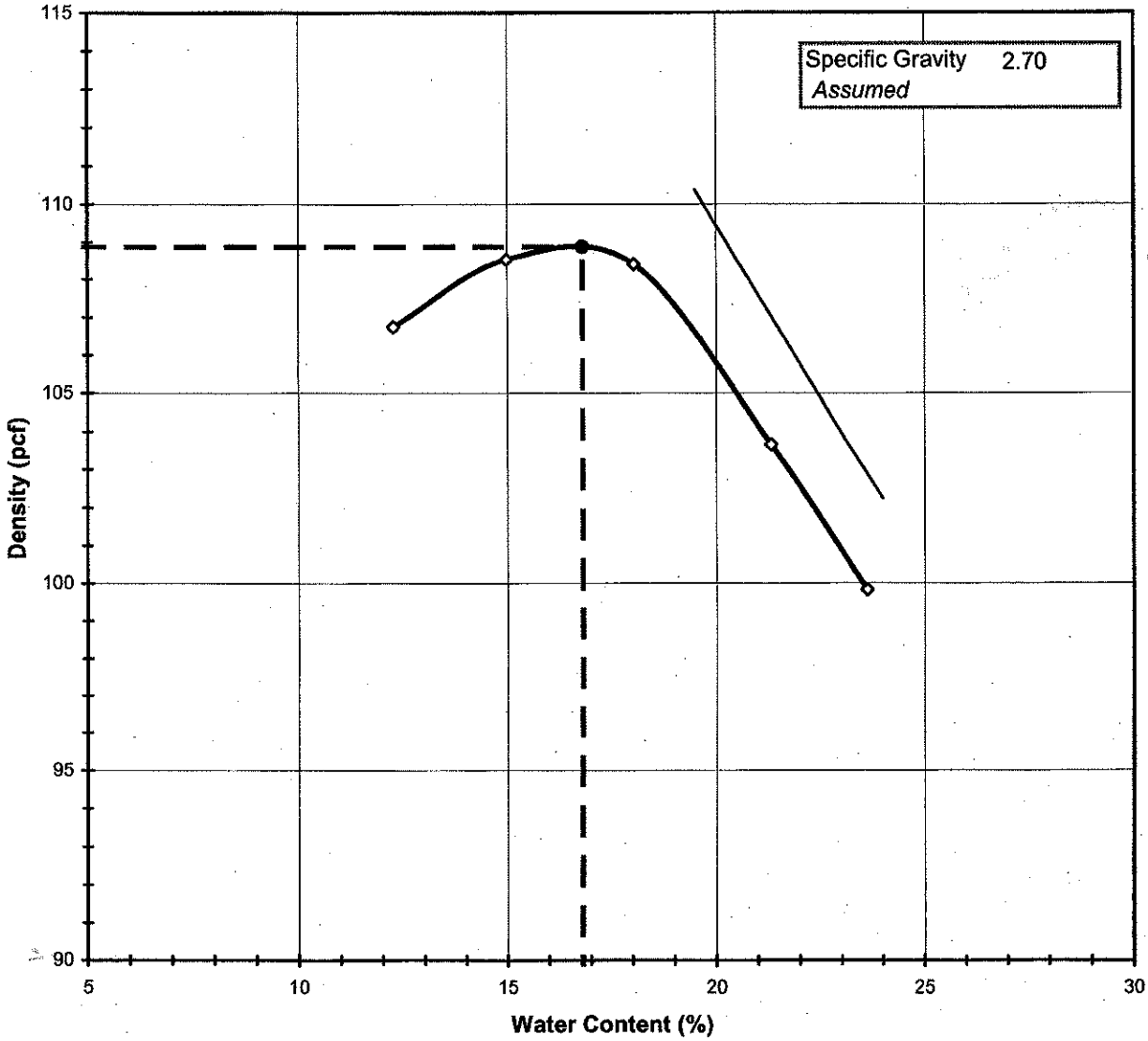
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	5
Client Reference	NORTH WAKE CO. MSW LF CLOSUI	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-05	Test Method	**STANDARD**

Visual Description: LIGHT BROWN TAN SILTY SAND

Optimum Water Content **16.8**
Maximum Dry Density **108.9**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	5
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-05		

Visual Description: LIGHT BROWN TAN SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6123	6197	6245	6211	6176
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1800	1875	1922	1889	1854
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	305	317	399	301	306
Wt. of Tare & WS (gm)	709.40	620.60	734.00	570.00	635.00
Wt. of Tare & DS (gm)	641.18	550.74	635.07	484.58	530.52
Wt. of Tare (gm)	84.70	84.30	86.50	83.70	88.00
Wt. of Water (gm)	68.22	69.86	98.93	85.42	104.48
Wt. of DS (gm)	556.48	466.44	548.57	400.88	442.52
Wet Density (gm/cc)	1.92	2.00	2.05	2.01	1.98
Wet Density (pcf)	119.8	124.8	128.0	125.7	123.4
Moisture Content (%)	**12.3**	**15.0**	**18.0**	**21.3**	**23.6**
Dry Density (pcf)	**106.7**	**108.5**	**108.4**	**103.6**	**99.8**

Zero Air Voids

Moisture Content (%)	19.5	23.0	24.0
Dry Unit Weight (pcf)	110.4	103.9	102.2

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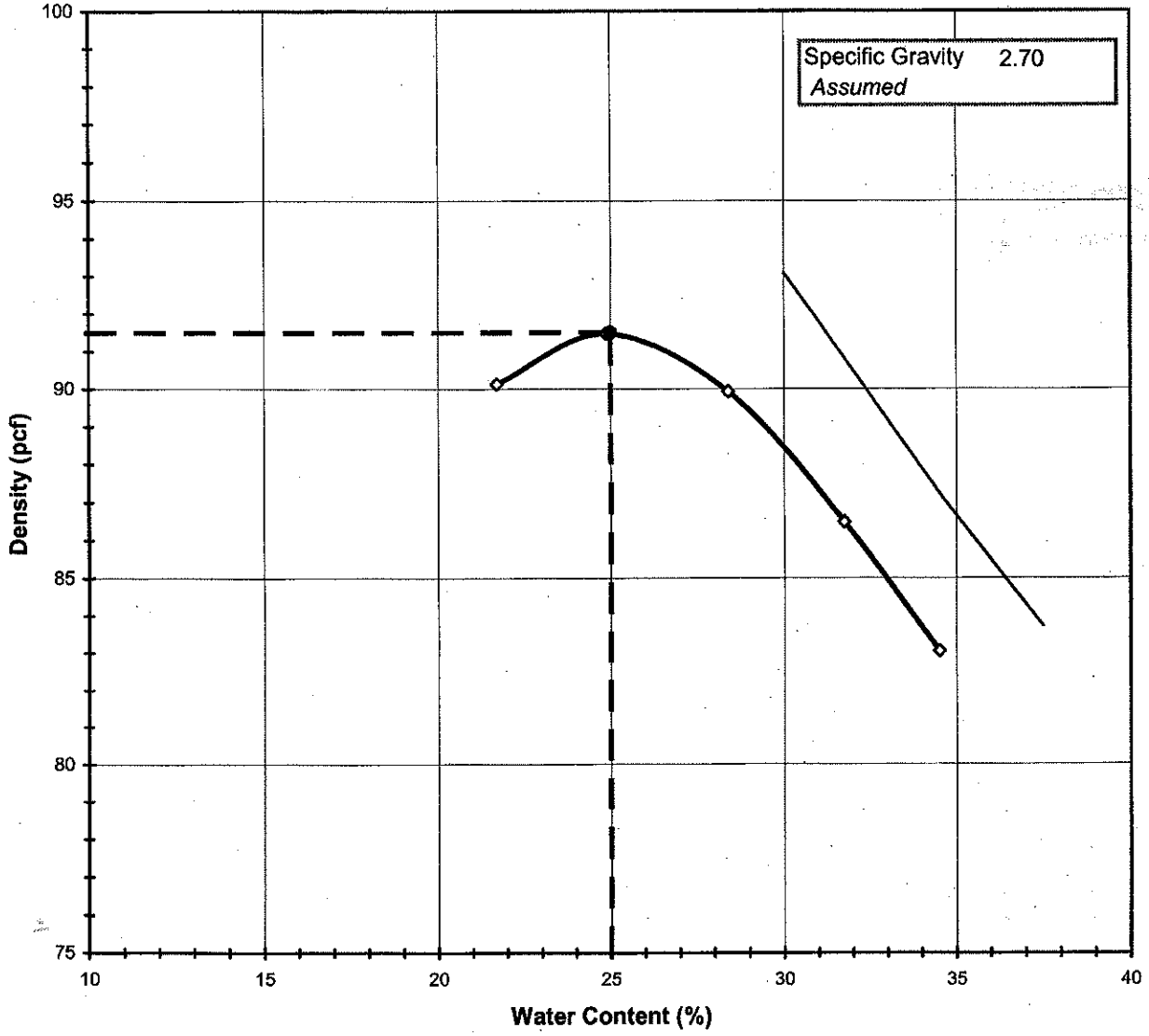
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	6
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-06	Test Method	**STANDARD**

Visual Description ORANGE SILTY SAND

Optimum Water Content **25.0**
Maximum Dry Density **91.5**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	6
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-06		

Visual Description ORANGE SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5971	6039	6057	6034	6001
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1648	1716	1734	1711	1678
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	315	310	304	311	306
Wt. of Tare & WS (gm)	568.00	598.70	604.60	529.00	530.40
Wt. of Tare & DS (gm)	486.39	501.35	495.34	421.82	416.86
Wt. of Tare (gm)	110.40	110.00	110.50	84.10	87.80
Wt. of Water (gm)	81.61	97.35	109.26	107.18	113.54
Wt. of DS (gm)	375.99	391.35	384.84	337.72	329.06
Wet Density (gm/cc)	1.76	1.83	1.85	1.83	1.79
Wet Density (pcf)	109.7	114.2	115.5	113.9	111.7
Moisture Content (%)	**21.7**	**24.9**	**28.4**	**31.7**	**34.5**
Dry Density (pcf)	**90.1**	**91.5**	**89.9**	**86.5**	**83.0**

Zero Air Voids

Moisture Content (%)	30.0	34.5	37.5
Dry Unit Weight (pcf)	93.1	87.2	83.7

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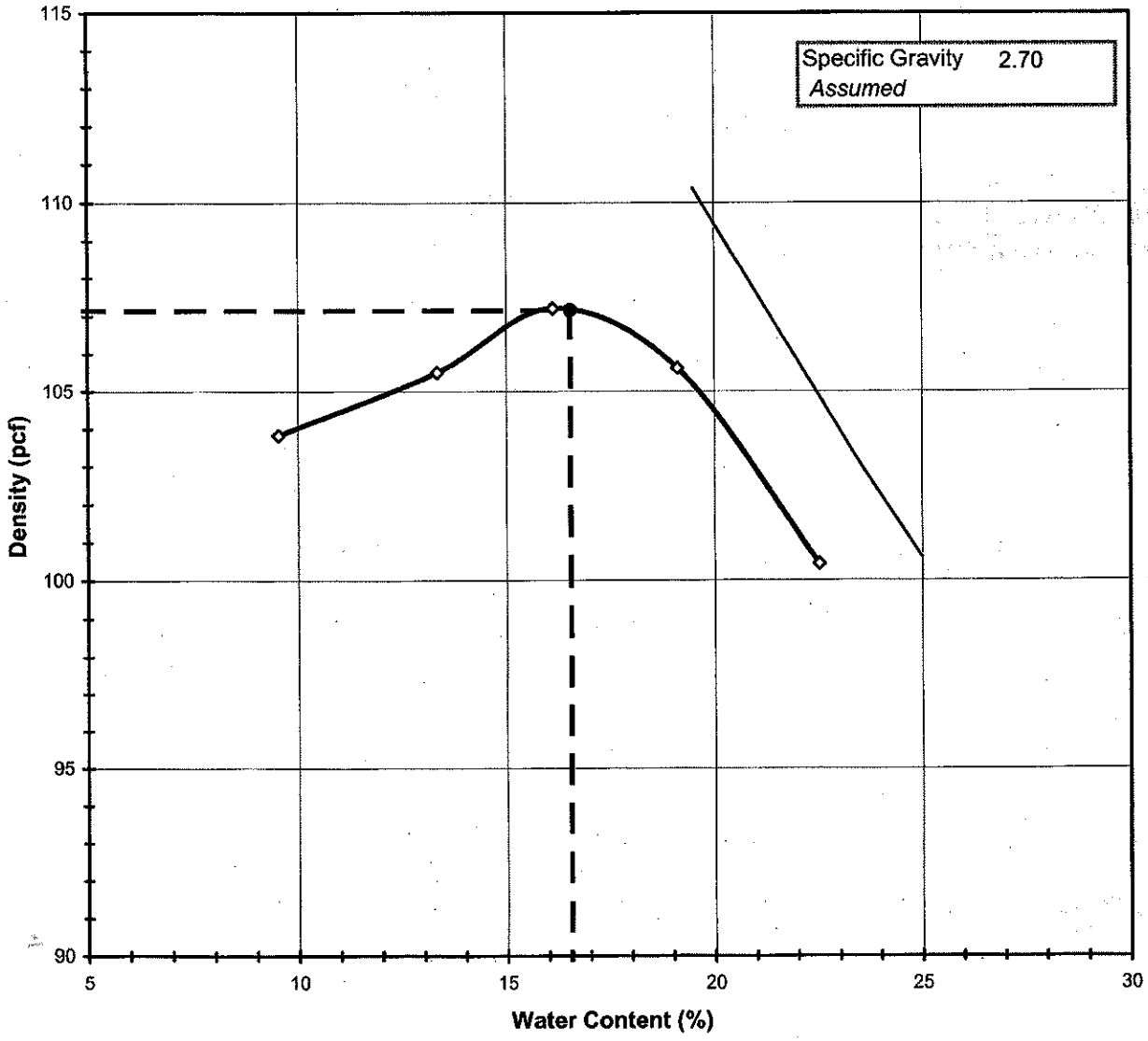
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	7
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-07	Test Method	**STANDARD**
Visual Description	TAN SILTY SAND		

Optimum Water Content	**16.5**
Maximum Dry Density	**107.2**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	7
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-07		

Visual Description: TAN SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6031	6119	6193	6212	6171
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1708	1796	1870	1890	1848
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	305	314	308	301	399
Wt. of Tare & WS (gm)	575.30	561.90	591.90	628.90	616.70
Wt. of Tare & DS (gm)	532.61	505.75	525.14	541.48	519.27
Wt. of Tare (gm)	84.50	84.70	111.00	84.20	86.40
Wt. of Water (gm)	42.69	56.15	66.76	87.42	97.43
Wt. of DS (gm)	448.11	421.05	414.14	457.28	432.87
Wet Density (gm/cc)	1.82	1.92	2.00	2.02	1.97
Wet Density (pcf)	113.7	119.6	124.5	125.8	123.0
Moisture Content (%)	**9.5**	**13.3**	**16.1**	**19.1**	**22.5**
Dry Density (pcf)	**103.8**	**105.5**	**107.2**	**105.6**	**100.4**

Zero Air Voids

Moisture Content (%)	19.5	23.5	25.0
Dry Unit Weight (pcf)	110.4	103.1	100.6

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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	10
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-10		

Visual Description: TAN SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6027	6105	6179	6158	6117
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1704	1782	1856	1835	1795
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	305	398	308	318	309
Wt. of Tare & WS (gm)	526.10	595.60	812.50	546.90	636.40
Wt. of Tare & DS (gm)	481.11	529.28	705.35	467.52	533.99
Wt. of Tare (gm)	84.40	84.30	111.30	87.10	109.00
Wt. of Water (gm)	44.99	66.32	107.15	79.38	102.41
Wt. of DS (gm)	396.71	444.98	594.05	380.42	424.99
Wet Density (gm/cc)	1.82	1.90	1.98	1.96	1.91
Wet Density (pcf)	113.4	118.7	123.6	122.2	119.5
Moisture Content (%)	**11.3**	**14.9**	**18.0**	**20.9**	**24.1**
Dry Density (pcf)	**101.9**	**103.3**	**104.7**	**101.1**	**96.3**

Zero Air Voids

Moisture Content (%)	22.0	24.5	27.0
Dry Unit Weight (pcf)	105.7	101.4	97.4

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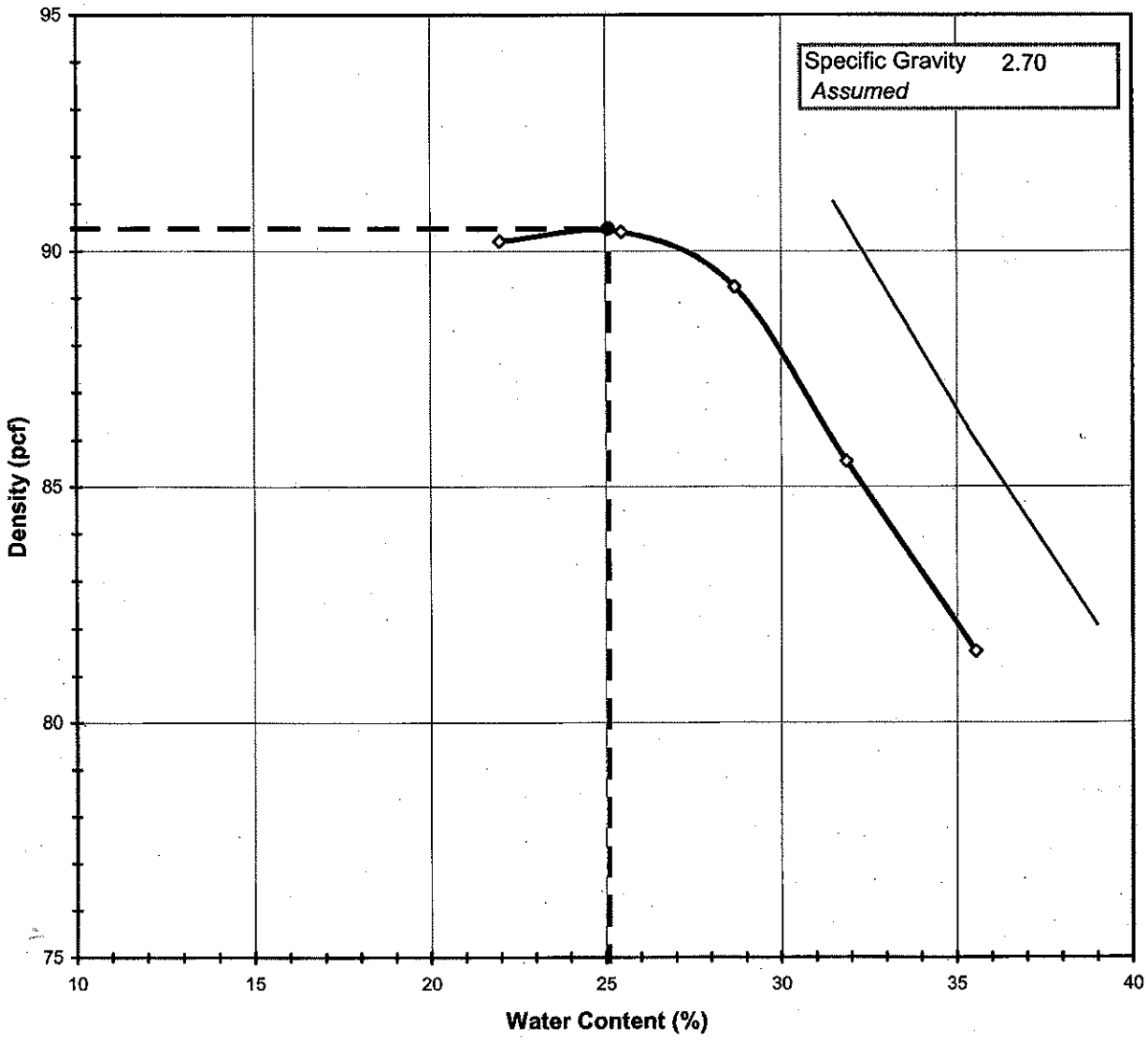
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	11
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-11	Test Method	**STANDARD**

Visual Description TAN SILTY SAND WITH MICA

Optimum Water Content **25.1**
Maximum Dry Density **90.5**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	11
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-11		

Visual Description: TAN SILTY SAND WITH MICA

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5976	6027	6048	6017	5982
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1653	1704	1725	1694	1660
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	907	904	903	906	902
Wt. of Tare & WS (gm)	531.10	435.90	568.80	560.60	643.00
Wt. of Tare & DS (gm)	437.86	350.25	445.15	428.47	478.08
Wt. of Tare (gm)	13.80	13.90	14.00	13.80	14.00
Wt. of Water (gm)	93.24	85.65	123.65	132.13	164.92
Wt. of DS (gm)	424.06	336.35	431.15	414.67	464.08
Wet Density (gm/cc)	1.76	1.82	1.84	1.81	1.77
Wet Density (pcf)	110.0	113.4	114.8	112.8	110.5
Moisture Content (%)	**22.0**	**25.5**	**28.7**	**31.9**	**35.5**
Dry Density (pcf)	**90.2**	**90.4**	**89.2**	**85.5**	**81.5**

Zero Air Voids

Moisture Content (%)	31.5	35.5	39.0
Dry Unit Weight (pcf)	91.0	86.0	82.1

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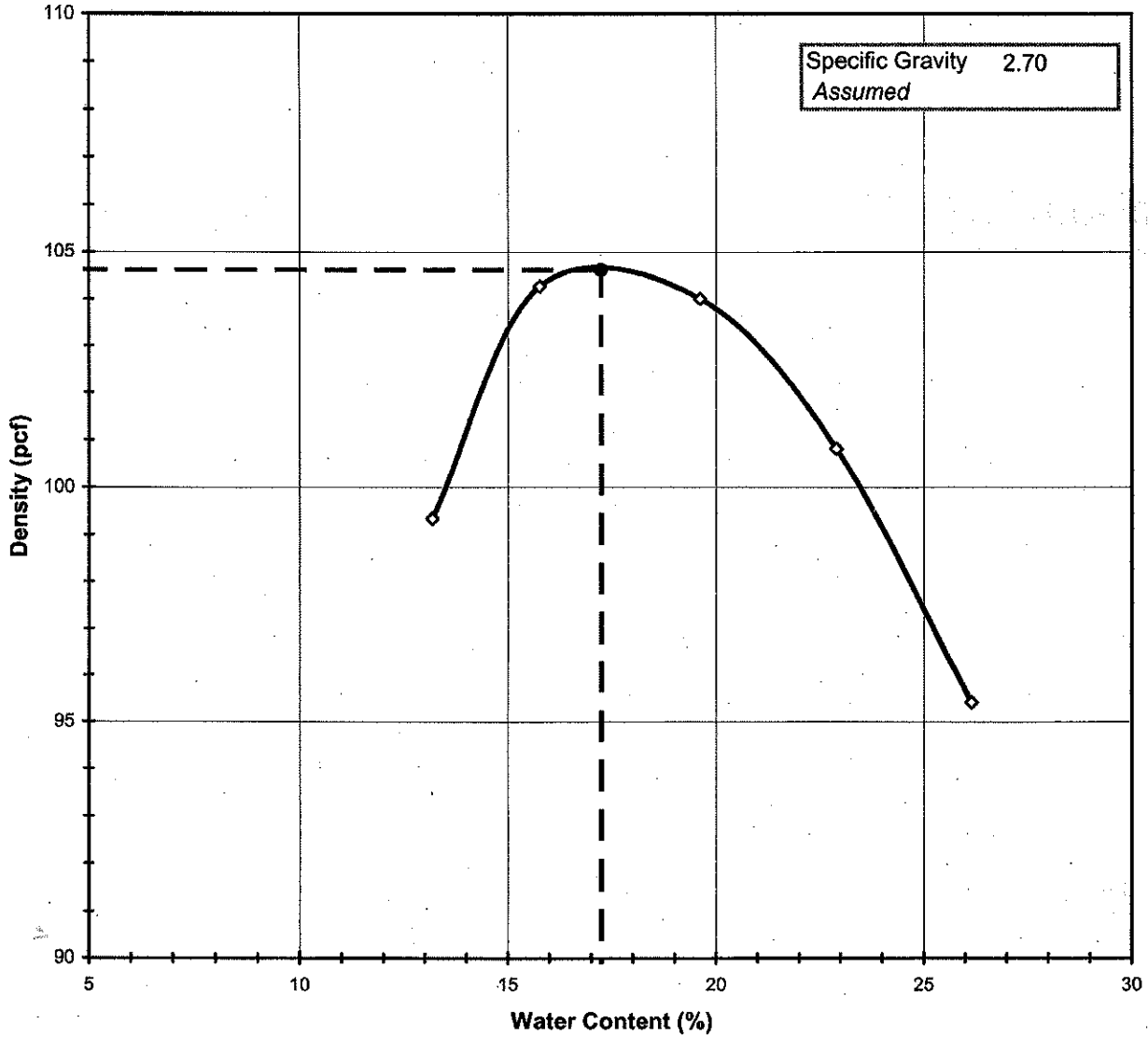
Client	THALLE CONSTRUCTION CO., INC.	Boring No.	12
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-12	Test Method	**STANDARD**

Visual Description BROWN ORANGE SANDY SILT

Optimum Water Content **17.2**
Maximum Dry Density **104.6**



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Client	THALLE CONSTRUCTION CO., INC.	Boring No.	12
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-12		

Visual Description: RED BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6012	6136	6191	6184	6131
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1689	1813	1869	1861	1808
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	300	K-7	318	305	309
Wt. of Tare & WS (gm)	561.30	640.20	653.90	615.50	608.60
Wt. of Tare & DS (gm)	508.85	566.77	560.89	516.58	505.20
Wt. of Tare (gm)	110.90	101.10	86.70	84.40	109.70
Wt. of Water (gm)	52.45	73.43	93.01	98.92	103.40
Wt. of DS (gm)	397.95	465.67	474.19	432.18	395.50

Wet Density (gm/cc)	1.80	1.93	1.99	1.99	1.93
Wet Density (pcf)	112.4	120.7	124.4	123.9	120.4
Moisture Content (%)	**13.2**	**15.8**	**19.6**	**22.9**	**26.1**
Dry Density (pcf)	**99.3**	**104.3**	**104.0**	**100.8**	**95.4**

Zero Air Voids

Moisture Content (%)	42.0	46.0	48.0
Dry Unit Weight (pcf)	79.0	75.1	73.4

Tested By SD *Date* 10/16/2008 *Checked By* GEM *Date* 10-17-08

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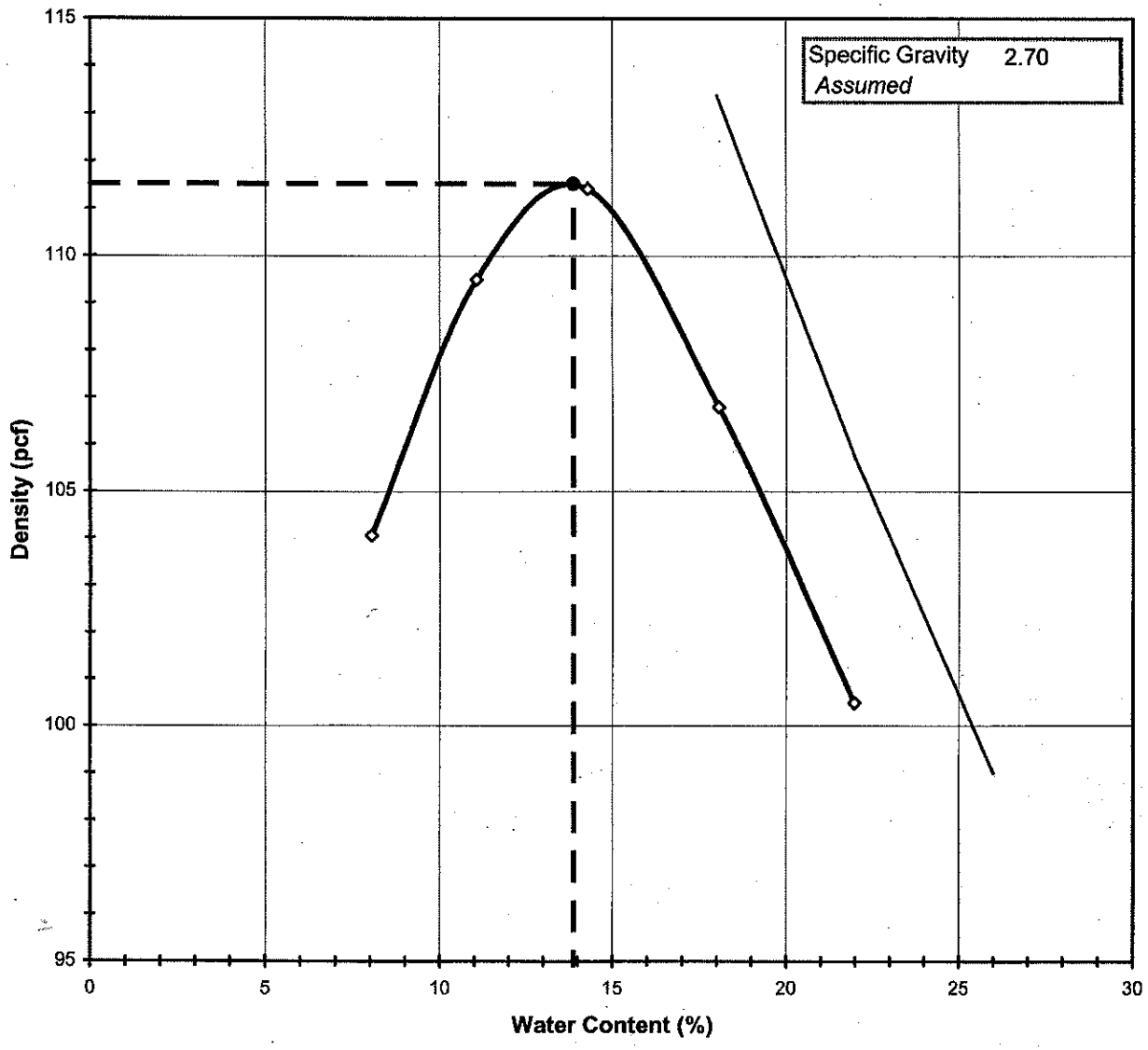
ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	13
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-13	Test Method	**STANDARD**
Visual Description	BROWN ORANGE SANDY SILT		

Optimum Water Content 13.9
Maximum Dry Density 111.5



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Client	THALLE CONSTRUCTION CO., INC.	Boring No.	13
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-13		

Visual Description: DARK GRAY SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	C

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	173
Mold diameter		6
Weight of the Mold		5561
Volume of the Mold(cc)		2120

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	9381	9693	9888	9845	9725
Wt.of Mold (gm)	5561	5561	5561	5561	5561
Wt. of WS	3820	4132	4327	4284	4164
Mold Volume (cc)	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number	904	317	902	903	906
Wt. of Tare & WS (gm)	613.50	654.40	647.60	566.10	655.10
Wt. of Tare & DS (gm)	568.87	597.60	568.30	481.61	539.64
Wt. of Tare (gm)	14.10	84.40	13.30	13.90	14.10
Wt. of Water (gm)	44.63	56.80	79.30	84.49	115.46
Wt. of DS (gm)	554.77	513.20	555.00	467.71	525.54

Wet Density (gm/cc)	1.80	1.95	2.04	2.02	1.96
Wet Density (pcf)	112.4	121.6	127.3	126.1	122.6
Moisture Content (%)	**8.0**	**11.1**	**14.3**	**18.1**	**22.0**
Dry Density (pcf)	**104.1**	**109.5**	**111.4**	**106.8**	**100.5**

Zero Air Voids

Moisture Content (%)	18.0	22.0	26.0
Dry Unit Weight (pcf)	113.4	105.7	99.0

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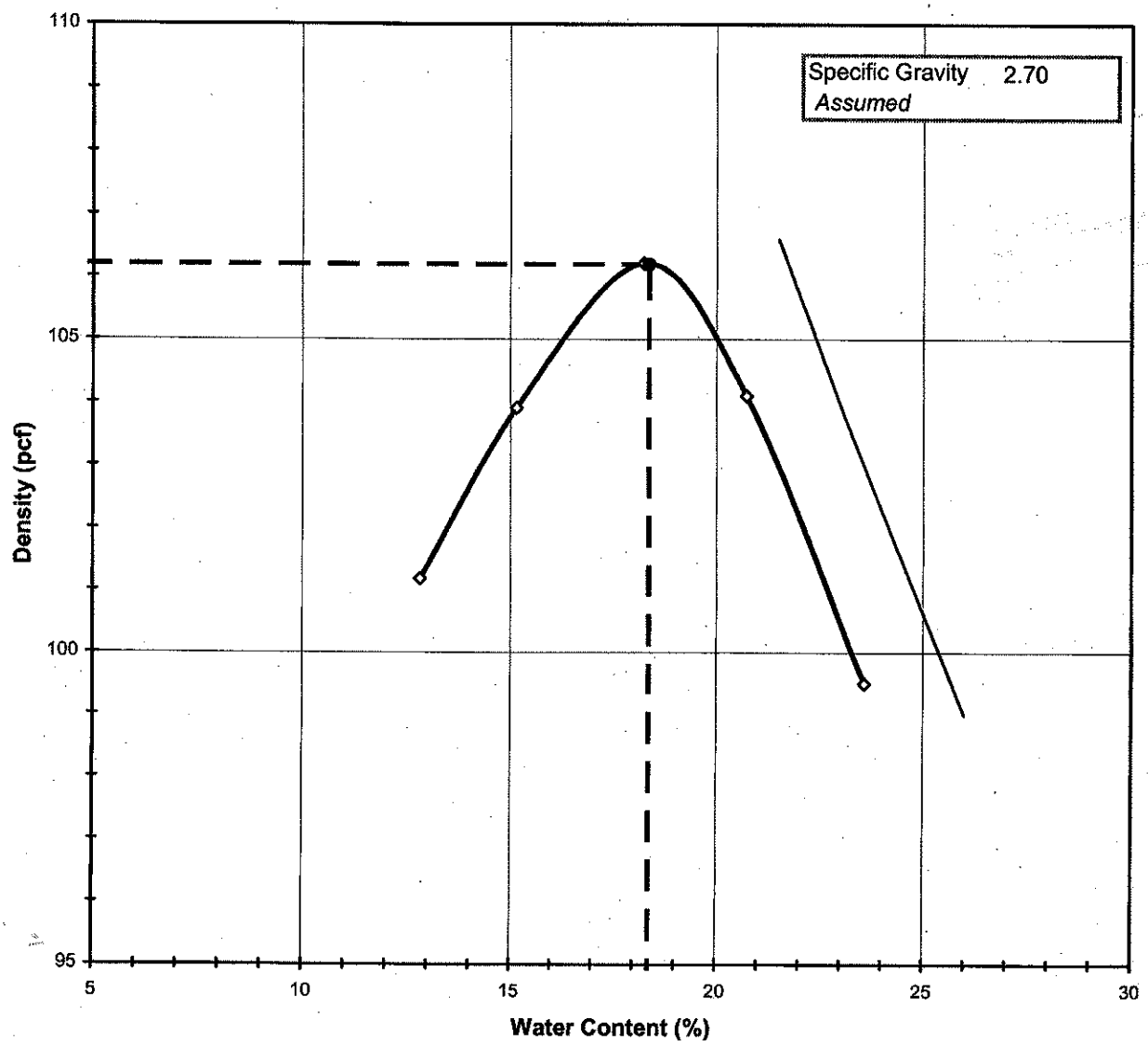
Client	THALLE CONSTRUCTION CO., INC.	Boring No.	15
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-15	Test Method	**STANDARD**

Visual Description: BROWN LEAN CLAY WITH SAND

Optimum Water Content **18.4**
Maximum Dry Density **106.2**



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Client	THALLE CONSTRUCTION CO., INC.	Boring No.	15
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-15		

Visual Description: BROWN LEAN CLAY WITH SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4323
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6037	6120	6209	6210	6169
Wt.of Mold (gm)	4323	4323	4323	4323	4323
Wt. of WS	1715	1797	1887	1888	1847
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	308	398	310	306	311
Wt. of Tare & WS (gm)	621.50	552.20	721.30	659.00	673.00
Wt. of Tare & DS (gm)	563.52	490.61	626.95	561.03	560.64
Wt. of Tare (gm)	111.20	84.30	110.10	88.30	84.20
Wt. of Water (gm)	57.98	61.59	94.35	97.97	112.36
Wt. of DS (gm)	452.32	406.31	516.85	472.73	476.44
Wet Density (gm/cc)	1.83	1.92	2.01	2.01	1.97
Wet Density (pcf)	114.1	119.7	125.6	125.7	123.0
Moisture Content (%)	**12.8**	**15.2**	**18.3**	**20.7**	**23.6**
Dry Density (pcf)	**101.2**	**103.9**	**106.2**	**104.1**	**99.5**

Zero Air Voids

Moisture Content (%)	21.5	23.0	26.0
Dry Unit Weight (pcf)	106.6	103.9	99.0

Tested By SD *Date* 10/16/2008 *Checked By* BDM *Date* 10-17-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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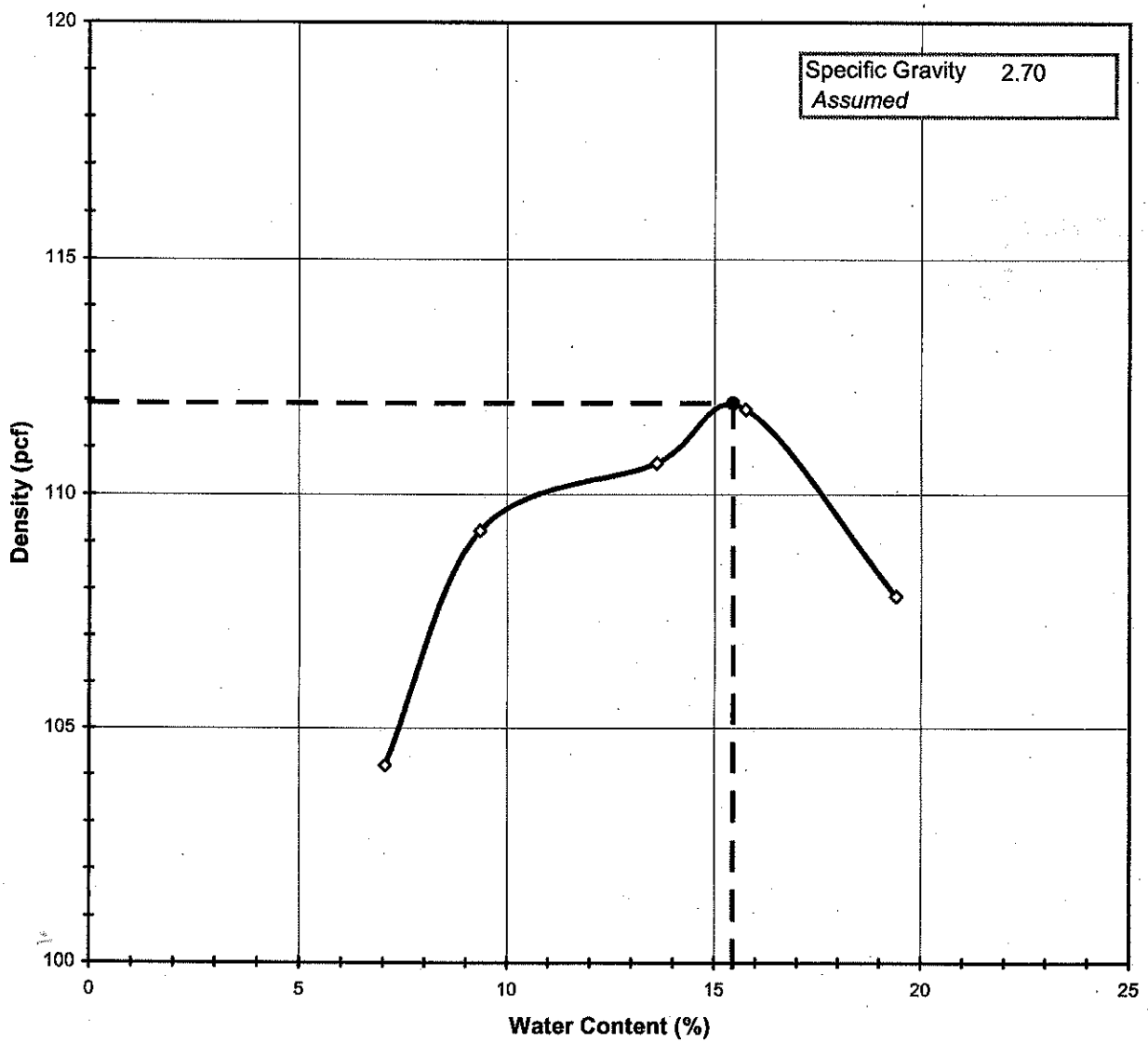
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	16
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-16	Test Method	**STANDARD**

Visual Description BROWN ORANGE SANDY SILT

Optimum Water Content **15.4**
Maximum Dry Density **111.9**



Tested By SD *Date* 10/16/2008 *Checked By* GEM *Date* 10-17-08

DCN:CT-S12 DATE:12/11/00 REVISION 5

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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	16
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-16		

Visual Description: TAN ORANGE SILTY SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	C

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	173
Mold diameter		6"
Weight of the Mold		5561
Volume of the Mold(cc)		2120

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	9351	9619	9833	9958	9936
Wt.of Mold (gm)	5561	5561	5561	5561	5561
Wt. of WS	3790	4058	4272	4397	4375
Mold Volume (cc)	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number	907	911	908	905	411
Wt. of Tare & WS (gm)	615.50	592.70	696.20	530.20	685.30
Wt. of Tare & DS (gm)	575.91	543.26	614.43	459.92	576.26
Wt. of Tare (gm)	14.20	13.90	13.50	13.70	14.10
Wt. of Water (gm)	39.59	49.44	81.77	70.28	109.04
Wt. of DS (gm)	561.71	529.36	600.93	446.22	562.16

Wet Density (gm/cc)	1.79	1.91	2.01	2.07	2.06
Wet Density (pcf)	111.5	119.4	125.7	129.4	128.8
Moisture Content (%)	**7.0**	**9.3**	**13.6**	**15.8**	**19.4**
Dry Density (pcf)	**104.2**	**109.2**	**110.7**	**111.8**	**107.8**

Zero Air Voids

Moisture Content (%)	32.0	34.0	36.0
Dry Unit Weight (pcf)	90.4	87.8	85.4

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DCN:CT-S12 DATE:12/11/00 REVISION 5

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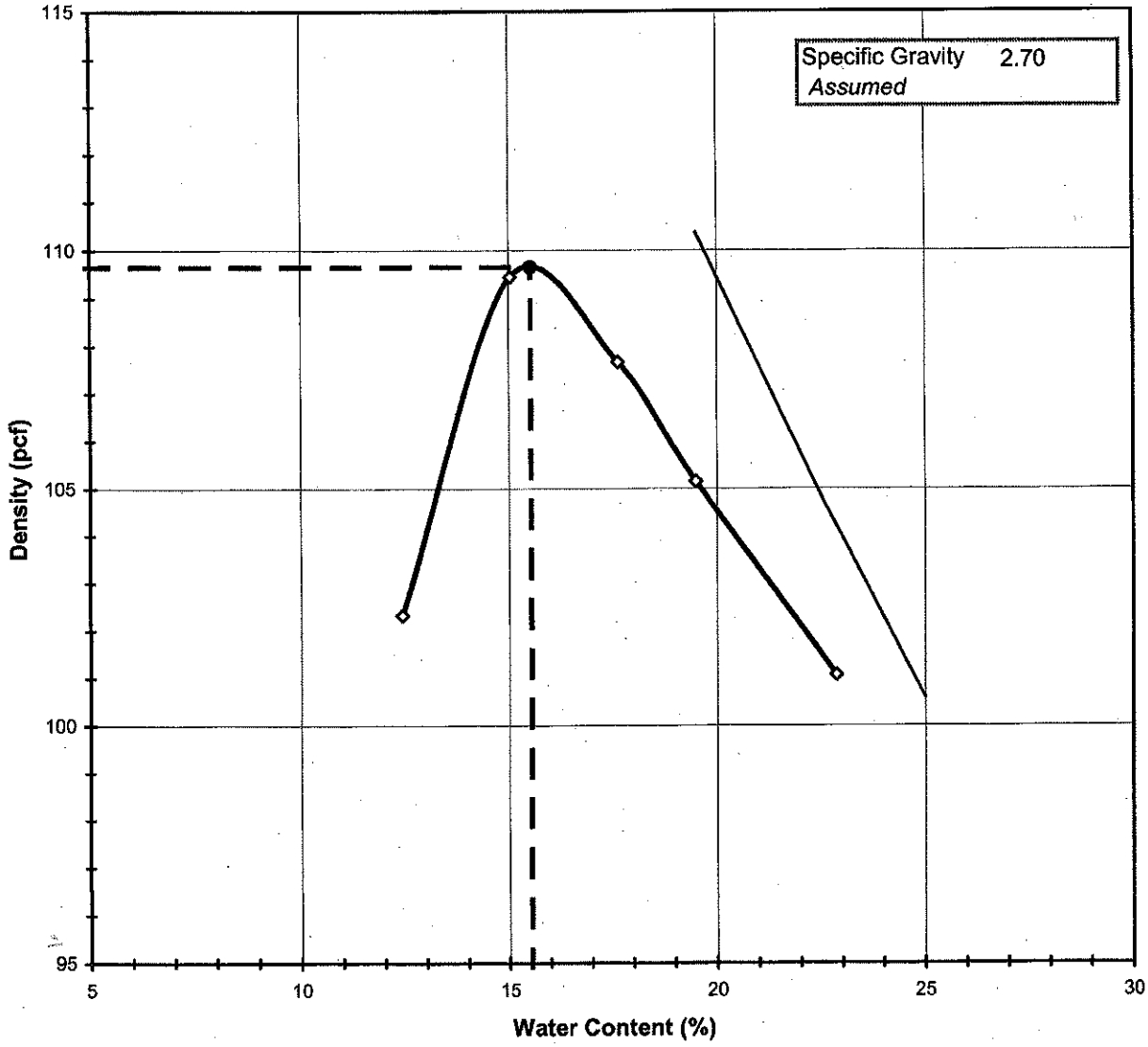
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 92K
Lab ID	2008-606-11-01	Test Method	**STANDARD**

Visual Description BROWN SANDY SILT

Optimum Water Content **15.5**
Maximum Dry Density **109.7**



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DCN:CT-S12 DATE: 6-25-98 REVISION 3

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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 92K
Lab ID	2008-606-11-01		

Visual Description: BROWN SANDY SILT

Total Weight of the Sample (gm)	19600
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	3
Percent Retained on 3/8"	4
Percent Retained on #4	6
Oversize Material	Not included
Procedure Used	B

TestType	**STANDARD**
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4322
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6050	6213	6225	6209	6187
Wt.of Mold (gm)	4322	4322	4322	4322	4322
Wt. of WS	1728	1891	1902	1887	1865
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	305	304	309	398	306
Wt. of Tare & WS (gm)	527.10	484.10	508.10	450.40	525.80
Wt. of Tare & DS (gm)	478.22	435.30	448.36	390.66	444.47
Wt. of Tare (gm)	84.80	110.90	109.70	84.20	88.70
Wt. of Water (gm)	48.88	48.80	59.74	59.74	81.33
Wt. of DS (gm)	393.42	324.40	338.66	306.46	355.77
Wet Density (gm/cc)	1.84	2.02	2.03	2.01	1.99
Wet Density (pcf)	115.0	125.9	126.7	125.6	124.2
Moisture Content (%)	**12.4**	**15.0**	**17.6**	**19.5**	**22.9**
Dry Density (pcf)	**102.3**	**109.4**	**107.7**	**105.1**	**101.1**

Zero Air Voids

Moisture Content (%)	19.5	22.5	25.0
Dry Unit Weight (pcf)	110.4	104.8	100.6

Tested By SD *Date* 12/2/2008 *Checked By* GBM *Date* 12-3-08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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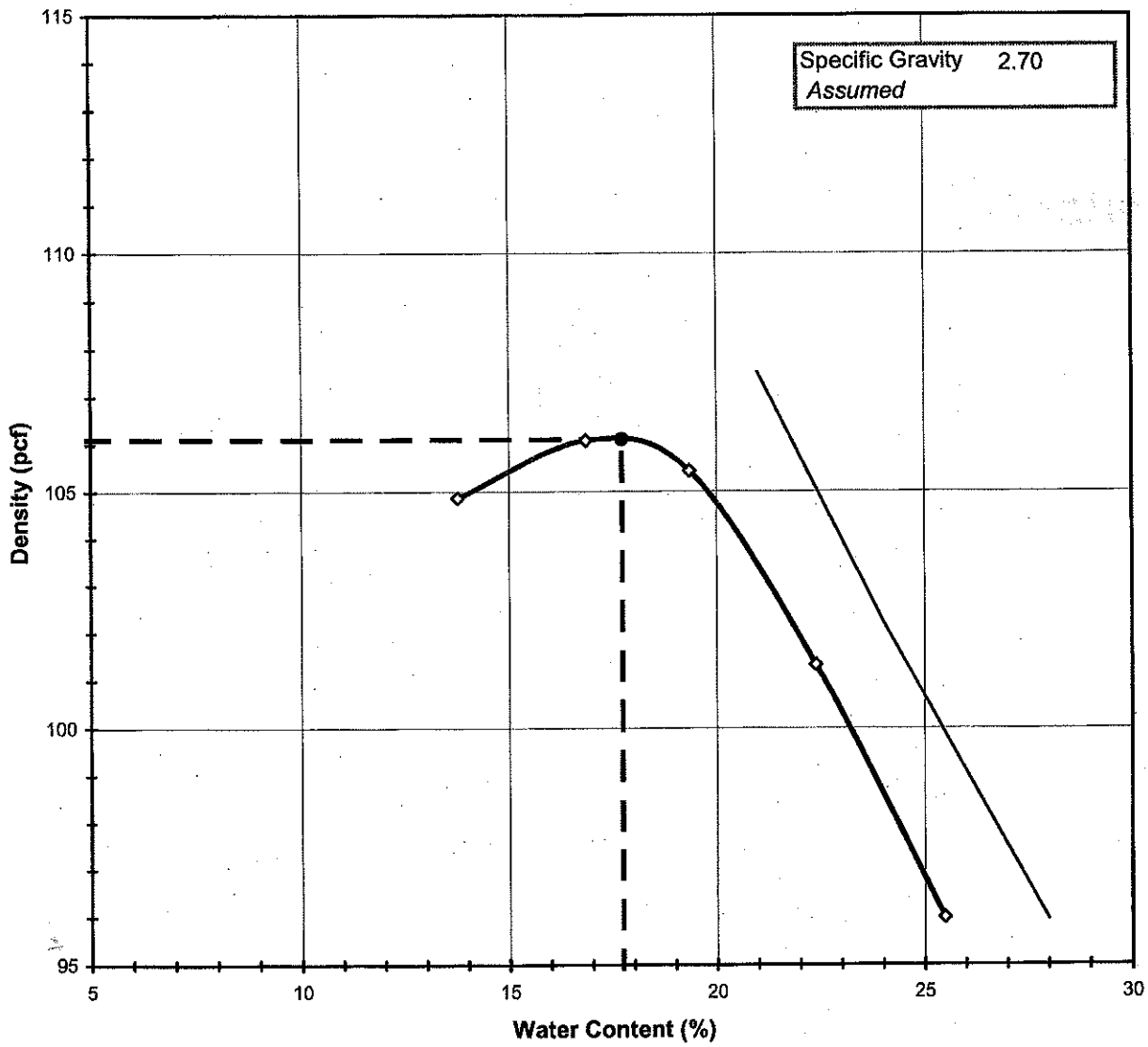
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 96K
Lab ID	2008-606-11-02	Test Method	**STANDARD**

Visual Description: BROWN SANDY SILT

Optimum Water Content **17.7**
Maximum Dry Density **106.1**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 96K
Lab ID	2008-606-11-02		

Visual Description: BROWN SANDY SILT

Total Weight of the Sample (gm)	21525
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	B

TestType	**STANDARD**
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4322
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6114	6184	6212	6185	6131
Wt.of Mold (gm)	4322	4322	4322	4322	4322
Wt. of WS	1792	1862	1890	1863	1809
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	818	300	310	K-7	318
Wt. of Tare & WS (gm)	489.70	493.50	659.10	584.70	561.20
Wt. of Tare & DS (gm)	447.06	438.37	570.16	497.91	464.85
Wt. of Tare (gm)	137.40	111.30	110.50	110.10	86.80
Wt. of Water (gm)	42.64	55.13	88.94	86.79	96.35
Wt. of DS (gm)	309.66	327.07	459.66	387.81	378.05
Wet Density (gm/cc)	1.91	1.99	2.02	1.99	1.93
Wet Density (pcf)	119.3	123.9	125.8	124.0	120.4
Moisture Content (%)	**13.8**	**16.9**	**19.3**	**22.4**	**25.5**
Dry Density (pcf)	**104.9**	**106.1**	**105.4**	**101.3**	**96.0**

Zero Air Voids

Moisture Content (%)	21.0	24.0	28.0
Dry Unit Weight (pcf)	107.5	102.2	95.9

Tested By SD *Date* 12/2/2008 *Checked By* TMS *Date* 12-30-08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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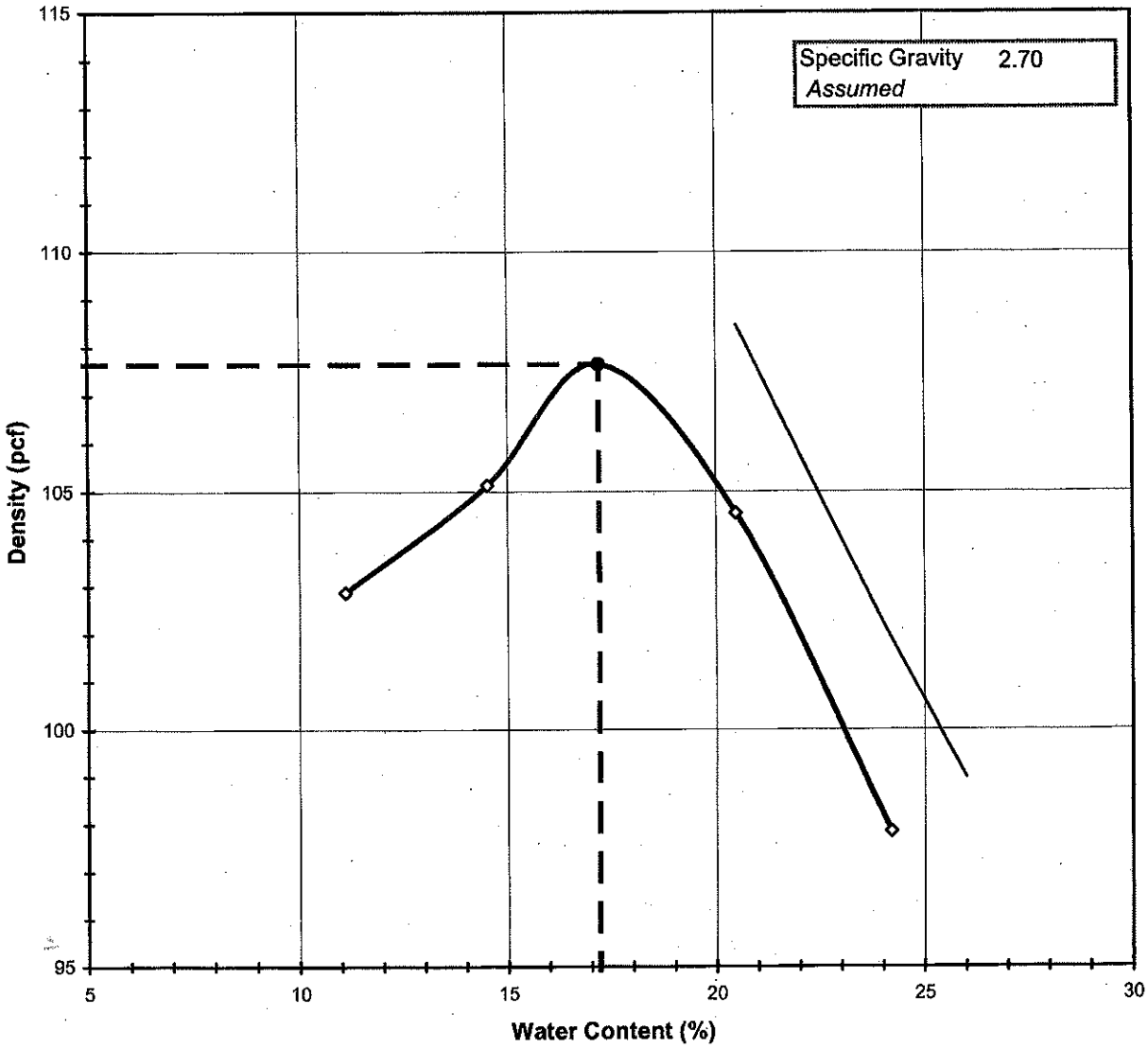
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 100K
Lab ID	2008-606-11-03	Test Method	**STANDARD**

Visual Description: BROWN SANDY LEAN CLAY

Optimum Water Content 17.2
Maximum Dry Density 107.6



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DCN:CT-S12 DATE: 6-25-98 REVISION 3

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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 100K
Lab ID	2008-606-11-03		

Visual Description: BROWN SANDY LEAN CLAY

Total Weight of the Sample (gm)	19780
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	5
Percent Retained on 3/8"	7
Percent Retained on #4	9
Oversize Material	Not included
Procedure Used	B

TestType	**STANDARD**
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4322
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6039	6131	6217	6214	6148
Wt.of Mold (gm)	4322	4322	4322	4322	4322
Wt. of WS	1717	1808	1895	1892	1826
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	315	311	314	303	312
Wt. of Tare & WS (gm)	575.90	446.10	526.30	537.10	546.00
Wt. of Tare & DS (gm)	529.42	400.24	461.55	464.77	456.16
Wt. of Tare (gm)	110.80	84.40	84.70	111.50	84.90
Wt. of Water (gm)	46.48	45.86	64.75	72.33	89.84
Wt. of DS (gm)	418.62	315.84	376.85	353.27	371.26
Wet Density (gm/cc)	1.83	1.93	2.02	2.02	1.95
Wet Density (pcf)	114.3	120.4	126.1	125.9	121.5
Moisture Content (%)	**11.1**	**14.5**	**17.2**	**20.5**	**24.2**
Dry Density (pcf)	**102.9**	**105.1**	**107.6**	**104.5**	**97.9**

Zero Air Voids

Moisture Content (%)	20.5	24.0	26.0
Dry Unit Weight (pcf)	108.5	102.2	99.0

Tested By SD *Date* 12/2/2008 *Checked By* TMS *Date* 12-3-08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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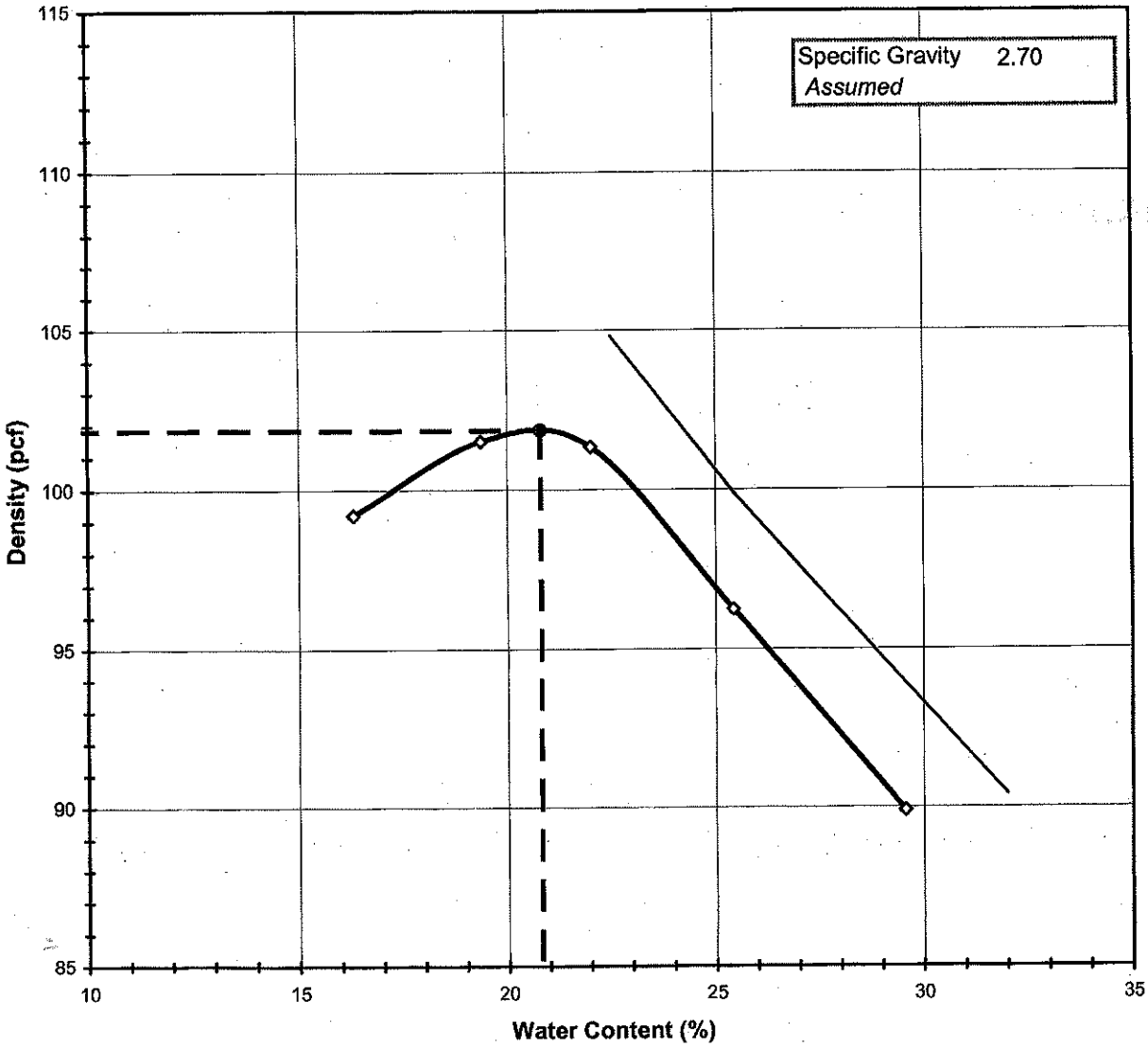
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSU	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 104K
Lab ID	2008-606-11-04	Test Method	**STANDARD**

Visual Description: GRAY/BROWN SANDY ELASTIC SILT

Optimum Water Content	**20.8**
Maximum Dry Density	**101.8**



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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 104K
Lab ID	2008-606-11-04		

Visual Description: GRAY/BROWN SANDY ELASTIC SILT

Total Weight of the Sample (gm)	20565
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	3
Percent Retained on 3/8"	7
Percent Retained on #4	10
Oversize Material	Not included
Procedure Used	B

TestType	**STANDARD**
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4322
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6055	6142	6179	6135	6071
Wt.of Mold (gm)	4322	4322	4322	4322	4322
Wt. of WS	1733	1820	1857	1813	1749
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	821	820	816	817	819
Wt. of Tare & WS (gm)	550.60	401.00	456.70	582.70	517.70
Wt. of Tare & DS (gm)	492.49	358.03	398.88	492.10	430.55
Wt. of Tare (gm)	135.90	136.20	136.30	135.70	135.70
Wt. of Water (gm)	58.11	42.97	57.82	90.60	87.15
Wt. of DS (gm)	356.59	221.83	262.58	356.40	294.85

Wet Density (gm/cc)	1.85	1.94	1.98	1.93	1.87
Wet Density (pcf)	115.4	121.2	123.6	120.7	116.5
Moisture Content (%)	**16.3**	**19.4**	**22.0**	**25.4**	**29.6**
Dry Density (pcf)	**99.2**	**101.5**	**101.3**	**96.2**	**89.9**

Zero Air Voids

Moisture Content (%)	22.5	25.4	32.0
Dry Unit Weight (pcf)	104.8	99.9	90.4

Tested By SD *Date* 12/2/2008 *Checked By* TMS *Date* 12-3-08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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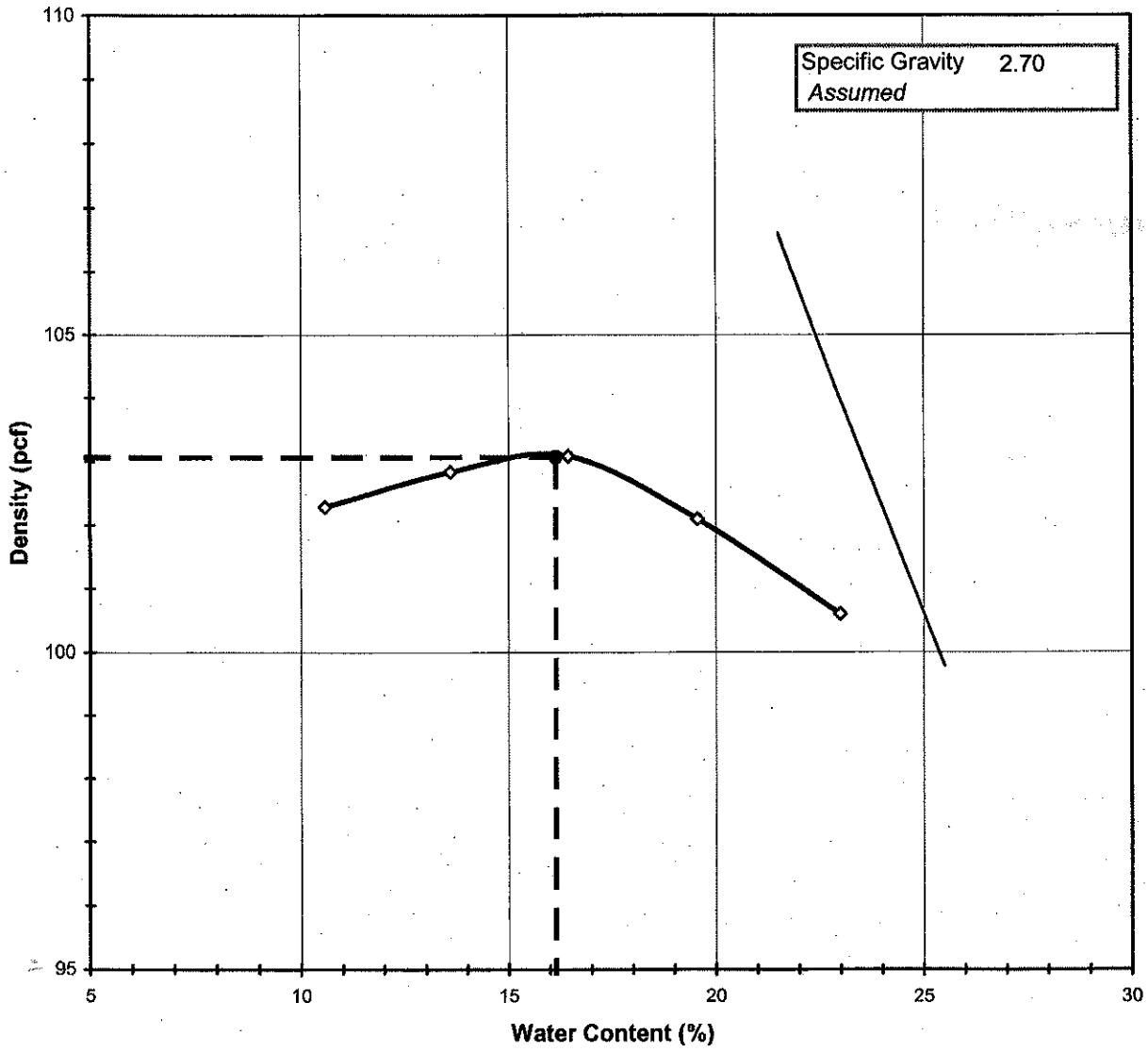
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 108K
Lab ID	2008-606-11-05	Test Method	**STANDARD**
Visual Description	BROWN SANDY ELASTIC SILT		

Optimum Water Content **16.1**
Maximum Dry Density **103.1**



Tested By SD *Date* 12/2/2008 *Checked By* TMS *Date* 12-4-08

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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Geotechnics
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Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 108K
Lab ID	2008-606-11-05		

Visual Description: BROWN SANDY ELASTIC SILT

Total Weight of the Sample (gm)	19735
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType	**STANDARD**
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4322
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6021	6077	6125	6156	6180
Wt.of Mold (gm)	4322	4322	4322	4322	4322
Wt. of WS	1699	1755	1803	1833	1858
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	317	398	317	399	308
Wt. of Tare & WS (gm)	560.35	558.90	496.80	458.50	545.50
Wt. of Tare & DS (gm)	514.85	502.07	438.62	397.69	465.01
Wt. of Tare (gm)	84.80	84.20	84.80	86.80	114.80
Wt. of Water (gm)	45.50	56.83	58.18	60.81	80.49
Wt. of DS (gm)	430.05	417.87	353.82	310.89	350.21

Wet Density (gm/cc)	1.81	1.87	1.92	1.96	1.98
Wet Density (pcf)	113.1	116.8	120.0	122.1	123.7
Moisture Content (%)	**10.6**	**13.6**	**16.4**	**19.6**	**23.0**
Dry Density (pcf)	**102.3**	**102.8**	**103.1**	**102.1**	**100.6**

Zero Air Voids

Moisture Content (%)	21.5	23.0	25.5
Dry Unit Weight (pcf)	106.6	103.9	99.8

Tested By SD *Date* 12/2/2008 *Checked By* TMS *Date* 12-4-08

DCN:CT-S12 DATE: 6-25-98 REVISION 3

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Geotechnics
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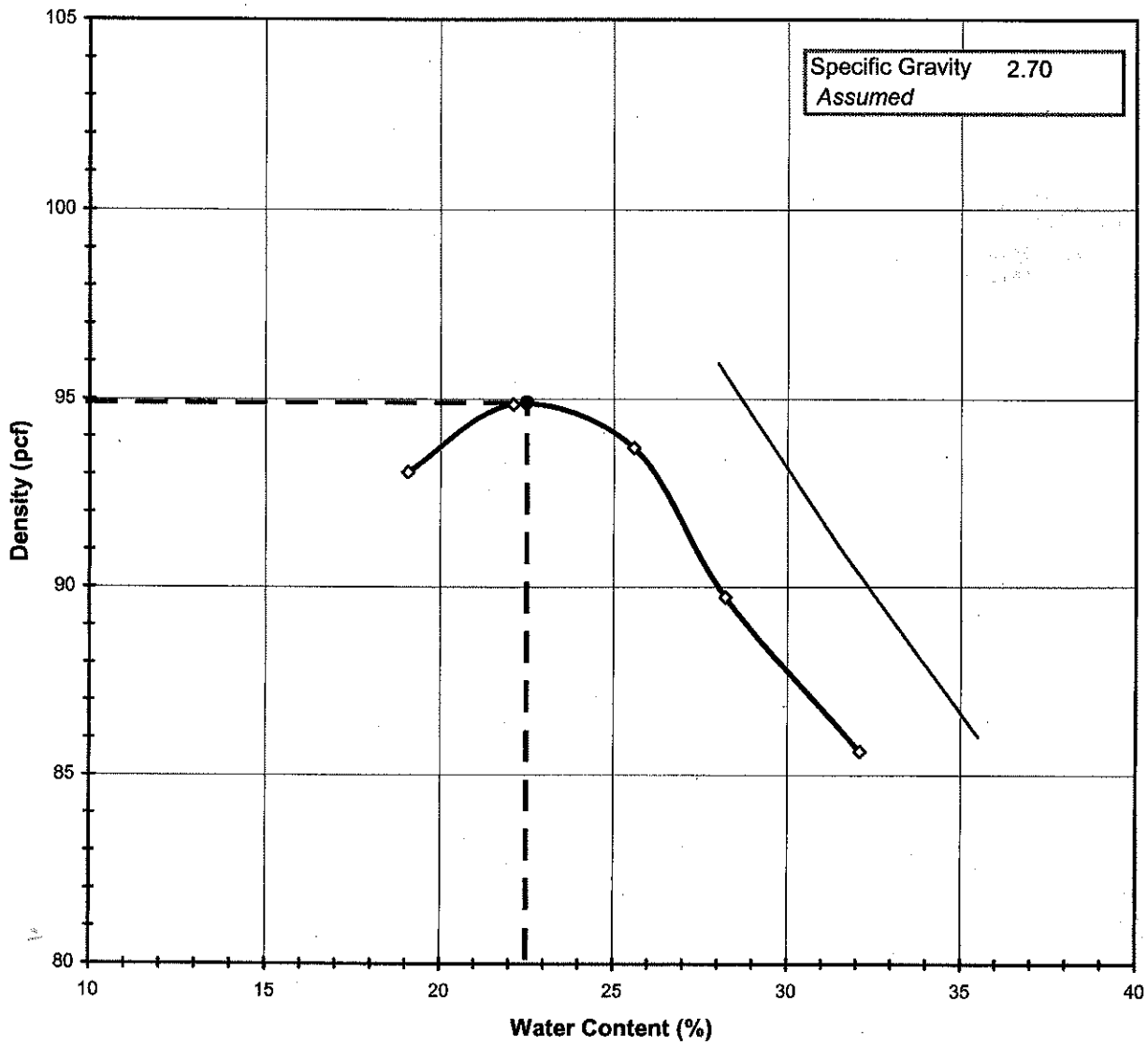
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 112K
Lab ID	2009-633-01-06	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **22.5**
Maximum Dry Density **94.9**



Tested By AL *Date* 3/3/2009 *Checked By* GEM *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 112K
Lab ID	2009-633-01-06		

Visual Description: BROWN SILTY SAND

Total Weight of the Sample (gm)	19648
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	1
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5984	6060	6087	6048	6019
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1664	1740	1767	1728	1699
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	G-13	307	306	310	303
Wt. of Tare & WS (gm)	632.10	369.80	497.10	625.40	491.60
Wt. of Tare & DS (gm)	555.49	322.91	413.85	512.03	399.17
Wt. of Tare (gm)	153.70	110.90	88.50	110.10	111.20
Wt. of Water (gm)	76.61	46.89	83.25	113.37	92.43
Wt. of DS (gm)	401.79	212.01	325.35	401.93	287.97

Wet Density (gm/cc)	1.78	1.86	1.89	1.84	1.81
Wet Density (pcf)	110.8	115.8	117.7	115.0	113.1
Moisture Content (%)	**19.1**	**22.1**	**25.6**	**28.2**	**32.1**
Dry Density (pcf)	**93.0**	**94.9**	**93.7**	**89.7**	**85.6**

Zero Air Voids

Moisture Content (%)	28.0	31.5	35.5
Dry Unit Weight (pcf)	95.9	91.0	86.0

Tested By AL *Date* 3/3/2009 *Checked By* GEM *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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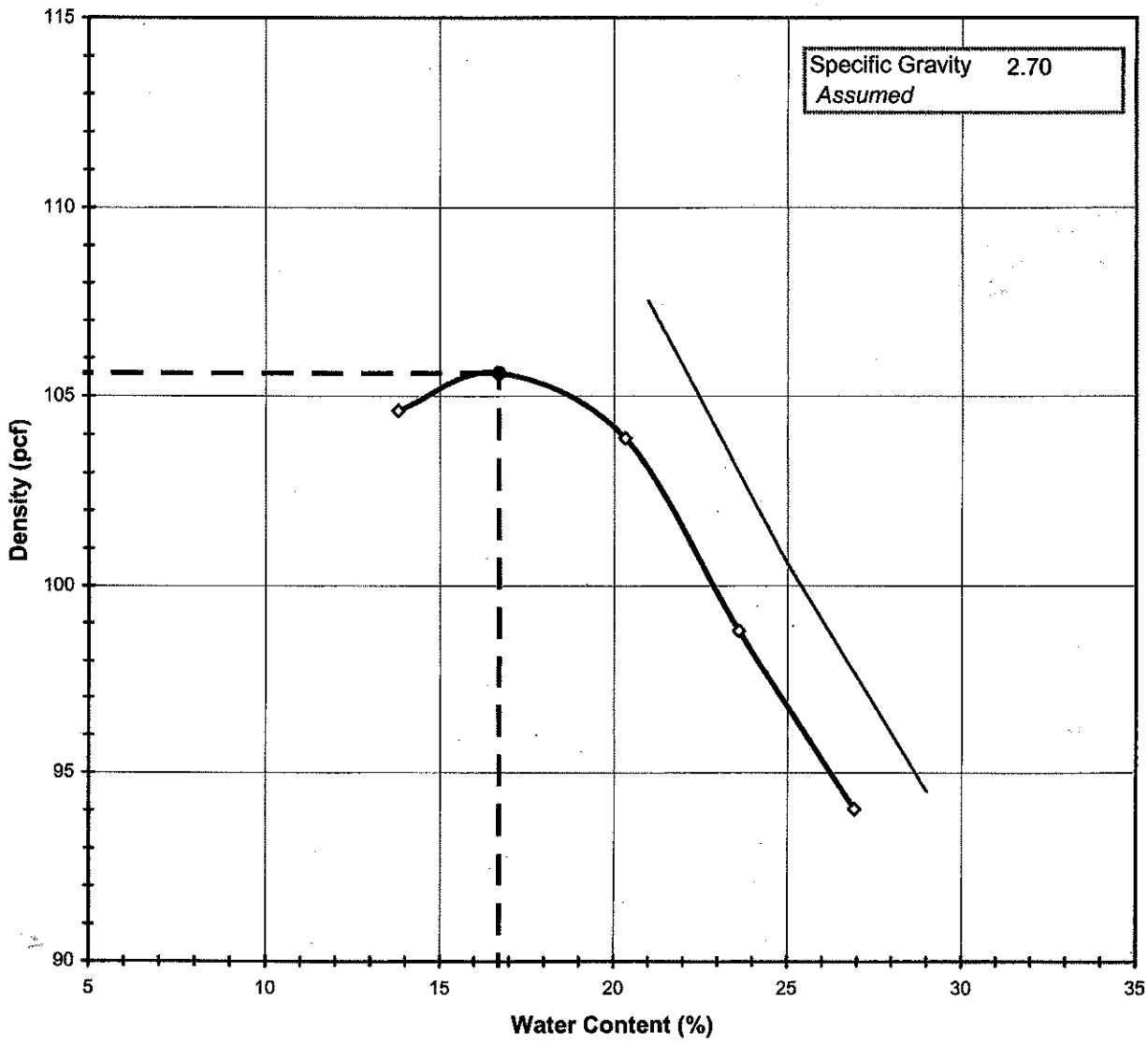
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 116K
Lab ID	2009-633-01-07	Test Method	**STANDARD**
Visual Description	BROWN SILTY SAND		

Optimum Water Content **16.7**
Maximum Dry Density **105.6**



Tested By S.D. *Date* 2/27/2009 *Checked By* GEM *Date* 3-5-09

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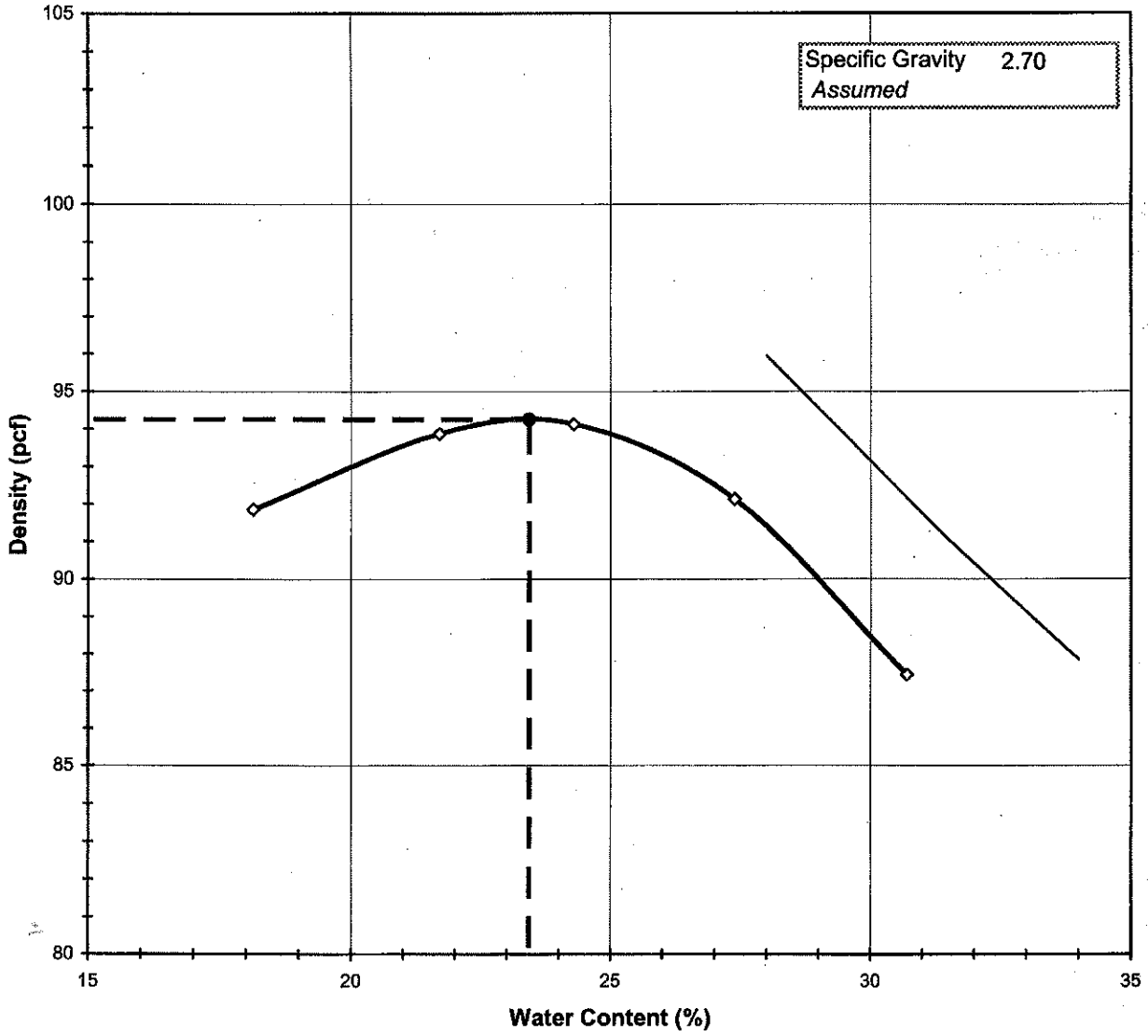
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 120K
Lab ID	2009-633-01-08	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **23.4**
Maximum Dry Density **94.3**



Tested By AL *Date* 3/3/09 *Checked By* GEM *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 120K
Lab ID	2009-633-01-08		

Visual Description: BROWN SILTY SAND

Total Weight of the Sample (gm)	17203
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5950	6036	6077	6083	6036
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1630	1716	1757	1763	1716
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	306	312	310	399	307
Wt. of Tare & WS (gm)	388.60	509.50	366.90	529.80	574.50
Wt. of Tare & DS (gm)	342.54	433.68	316.66	434.60	465.57
Wt. of Tare (gm)	88.60	84.30	109.90	86.90	110.80
Wt. of Water (gm)	46.06	75.82	50.24	95.20	108.93
Wt. of DS (gm)	253.94	349.38	206.76	347.70	354.77
Wet Density (gm/cc)	1.74	1.83	1.87	1.88	1.83
Wet Density (pcf)	108.5	114.2	117.0	117.3	114.3
Moisture Content (%)	**18.1**	**21.7**	**24.3**	**27.4**	**30.7**
Dry Density (pcf)	**91.9**	**93.9**	**94.1**	**92.1**	**87.4**

Zero Air Voids

Moisture Content (%)	28.0	31.5	34.0
Dry Unit Weight (pcf)	95.9	91.0	87.8

Tested By AL *Date* 3/3/09 *Checked By* Gem *Date* 3-6-09

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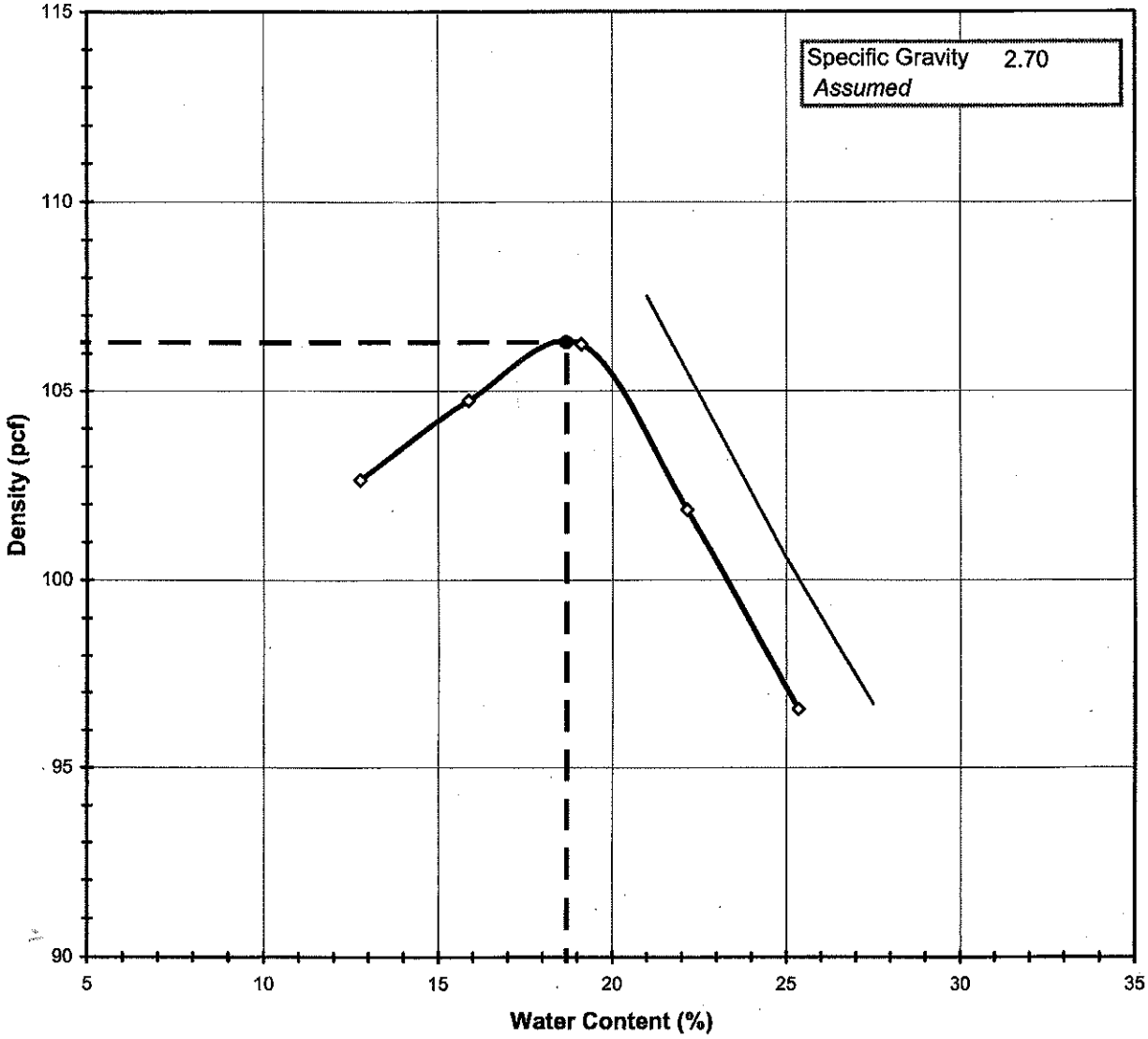
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 124K
Lab ID	2009-633-01-09	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **18.7**
Maximum Dry Density **106.3**



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ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 124K
Lab ID	2009-633-01-09		

Visual Description: BROWN SILTY SAND

Total Weight of the Sample (gm)	22731
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	5
Oversize Material	Not included
Procedure Used	B

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6059	6143	6221	6189	6138
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1739	1823	1901	1869	1818
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	317	G-15	315	300	K-7
Wt. of Tare & WS (gm)	464.90	528.00	503.90	493.30	453.00
Wt. of Tare & DS (gm)	421.81	476.36	440.75	423.93	383.66
Wt. of Tare (gm)	84.30	151.20	110.50	110.80	110.10
Wt. of Water (gm)	43.09	51.64	63.15	69.37	69.34
Wt. of DS (gm)	337.51	325.16	330.25	313.13	273.56
Wet Density (gm/cc)	1.85	1.95	2.03	1.99	1.94
Wet Density (pcf)	115.7	121.4	126.6	124.4	121.0
Moisture Content (%)	**12.8**	**15.9**	**19.1**	**22.2**	**25.3**
Dry Density (pcf)	**102.6**	**104.7**	**106.2**	**101.9**	**96.6**

Zero Air Voids

Moisture Content (%)	21.0	25.0	27.5
Dry Unit Weight (pcf)	107.5	100.6	96.7

Tested By AL *Date* 3/3/2009 *Checked By* GEM *Date* 3-5-09

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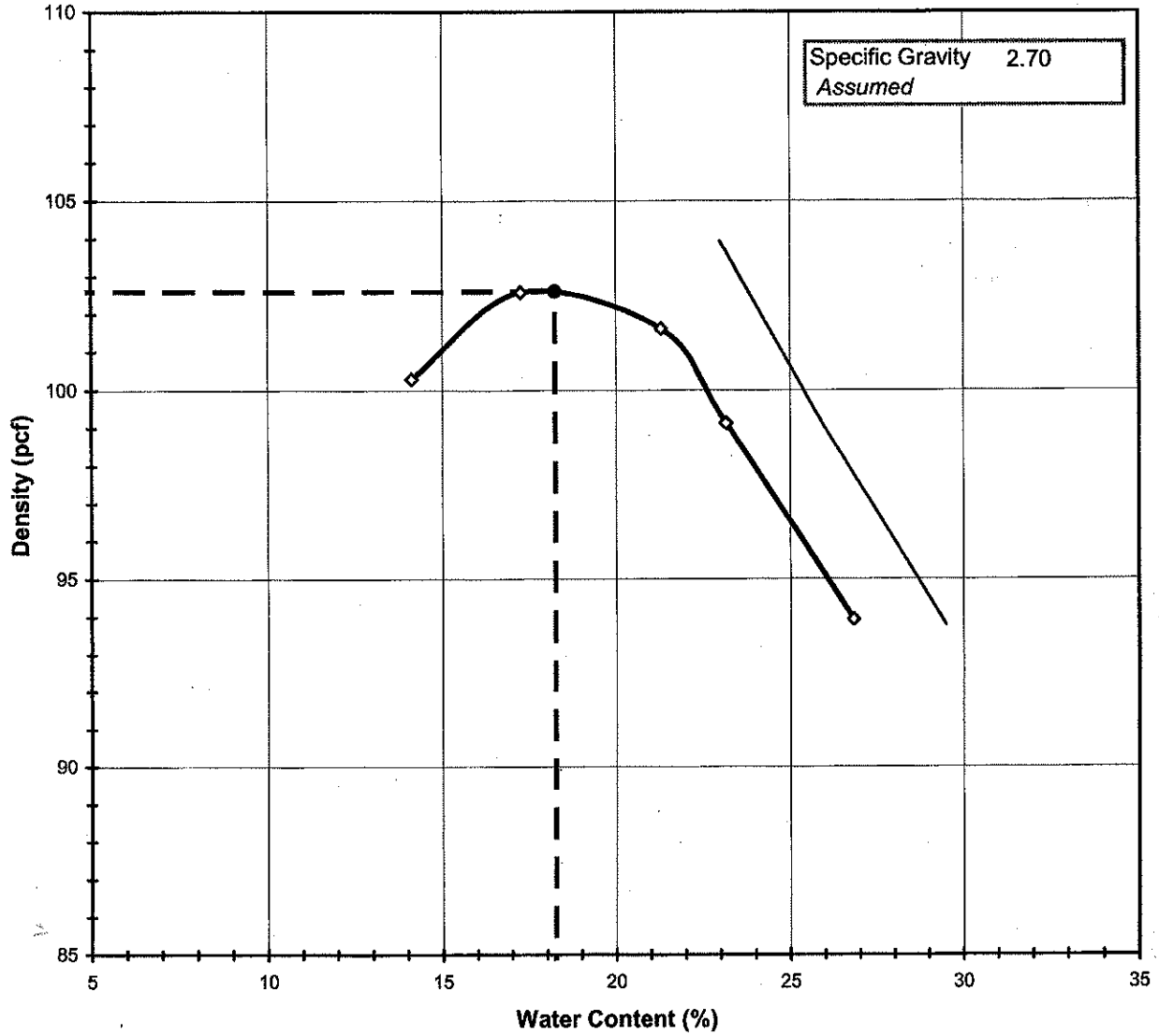
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 136K
Lab ID	2009-633-01-12	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **18.3**
Maximum Dry Density **102.6**



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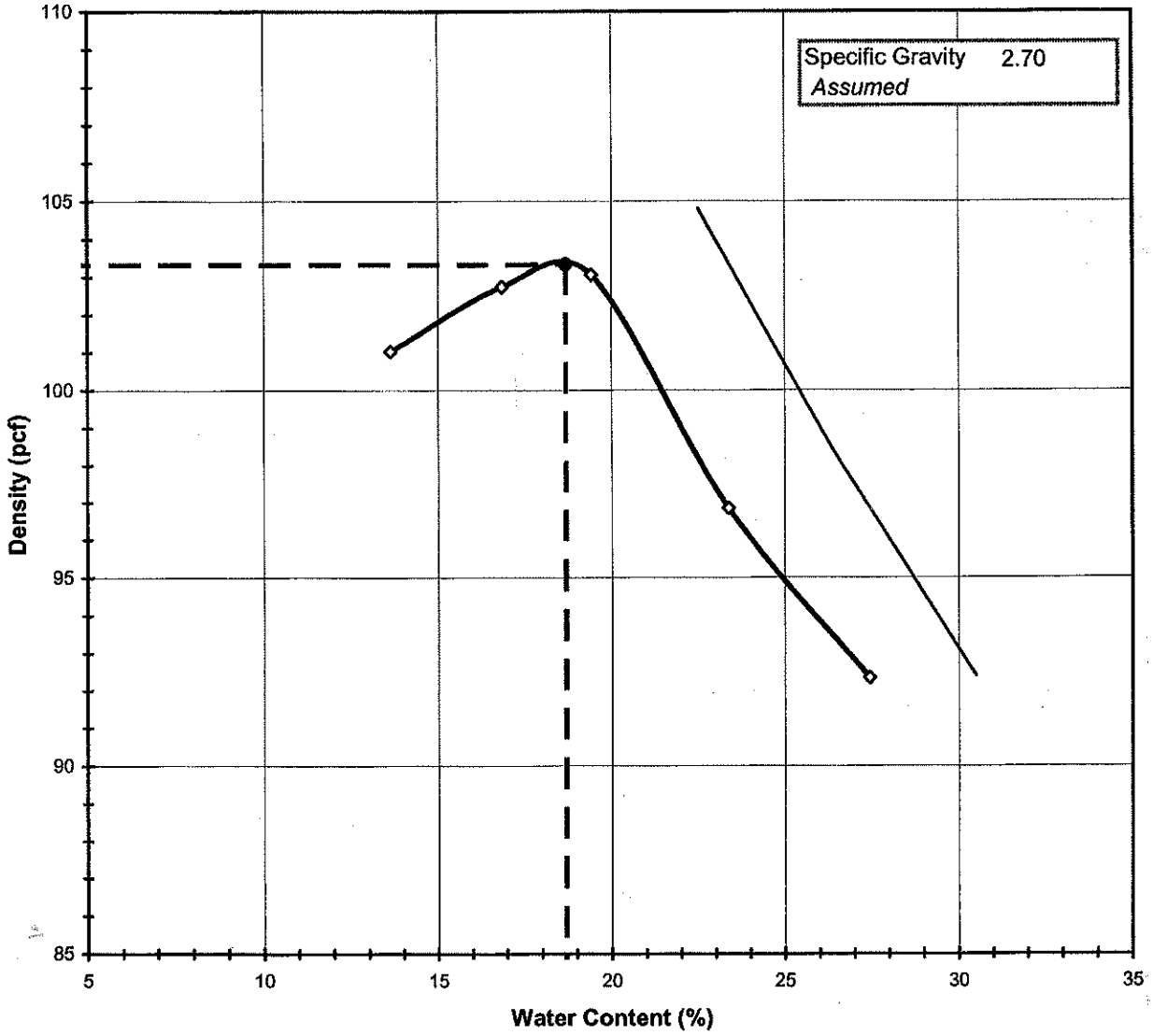
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSUR	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 128K
Lab ID	2009-633-01-10	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **18.7**
Maximum Dry Density **103.3**



Tested By AL *Date* 3/3/2009 *Checked By* GEM *Date* 3-5-09

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ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSUR	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 128K
Lab ID	2009-633-01-10		

Visual Description: BROWN SILTY SAND

Total Weight of the Sample (gm)	20428
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6044	6123	6169	6115	6087
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1724	1803	1849	1795	1767
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	310	303	307	301	318
Wt. of Tare & WS (gm)	622.60	654.10	541.30	467.20	504.40
Wt. of Tare & DS (gm)	561.13	575.77	471.34	394.64	414.49
Wt. of Tare (gm)	110.10	111.10	111.20	84.10	86.80
Wt. of Water (gm)	61.47	78.33	69.96	72.56	89.91
Wt. of DS (gm)	451.03	464.67	360.14	310.54	327.69

Wet Density (gm/cc)	1.84	1.92	1.97	1.91	1.89
Wet Density (pcf)	114.8	120.1	123.1	119.5	117.7
Moisture Content (%)	**13.6**	**16.9**	**19.4**	**23.4**	**27.4**
Dry Density (pcf)	**101.0**	**102.7**	**103.0**	**96.8**	**92.3**

Zero Air Voids

Moisture Content (%)	22.5	26.5	30.5
Dry Unit Weight (pcf)	104.8	98.2	92.4

Tested By AL *Date* 3/3/2009 *Checked By* GLM *Date* 3-5-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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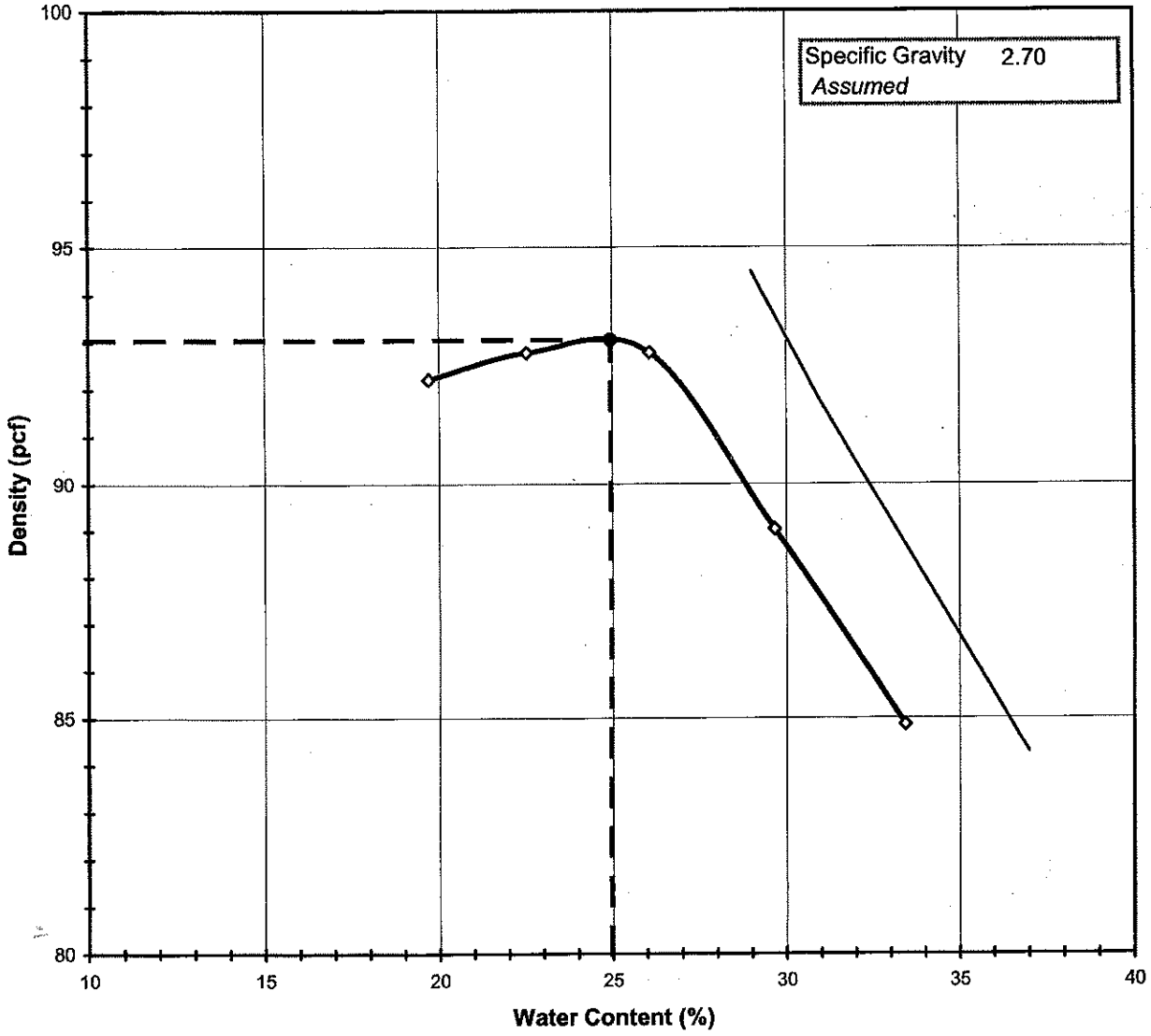
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 132K
Lab ID	2009-633-01-11	Test Method	**STANDARD**

Visual Description ORANGE SILTY SAND

Optimum Water Content **25.0**
Maximum Dry Density **93.0**



Tested By AL *Date* 3/3/2009 *Checked By* GBM *Date* 3-5-09

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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 132K
Lab ID	2009-633-01-11		

Visual Description: ORANGE SILTY SAND

Total Weight of the Sample (gm)	19189
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	1
Percent Retained on 3/8"	NA
Percent Retained on #4	3
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5978	6027	6077	6054	6021
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1658	1707	1757	1734	1701
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	399	308	306	312	304
Wt. of Tare & WS (gm)	481.20	474.50	446.10	438.40	480.10
Wt. of Tare & DS (gm)	416.26	407.74	372.07	357.39	387.52
Wt. of Tare (gm)	86.70	111.50	88.30	84.30	110.60
Wt. of Water (gm)	64.94	66.76	74.03	81.01	92.58
Wt. of DS (gm)	329.56	296.24	283.77	273.09	276.92
Wet Density (gm/cc)	1.77	1.82	1.87	1.85	1.81
Wet Density (pcf)	110.4	113.7	117.0	115.4	113.2
Moisture Content (%)	**19.7**	**22.5**	**26.1**	**29.7**	**33.4**
Dry Density (pcf)	**92.2**	**92.8**	**92.8**	**89.0**	**84.9**

Zero Air Voids

Moisture Content (%)	29.0	31.0	37.0
Dry Unit Weight (pcf)	94.5	91.7	84.3

Tested By AL *Date* 3/3/2009 *Checked By* GEM *Date* 3-5-09

DCN:CT-S12 DATE:12/11/00 REVISION 5 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-11 Proctor.XLS]Sheet1*

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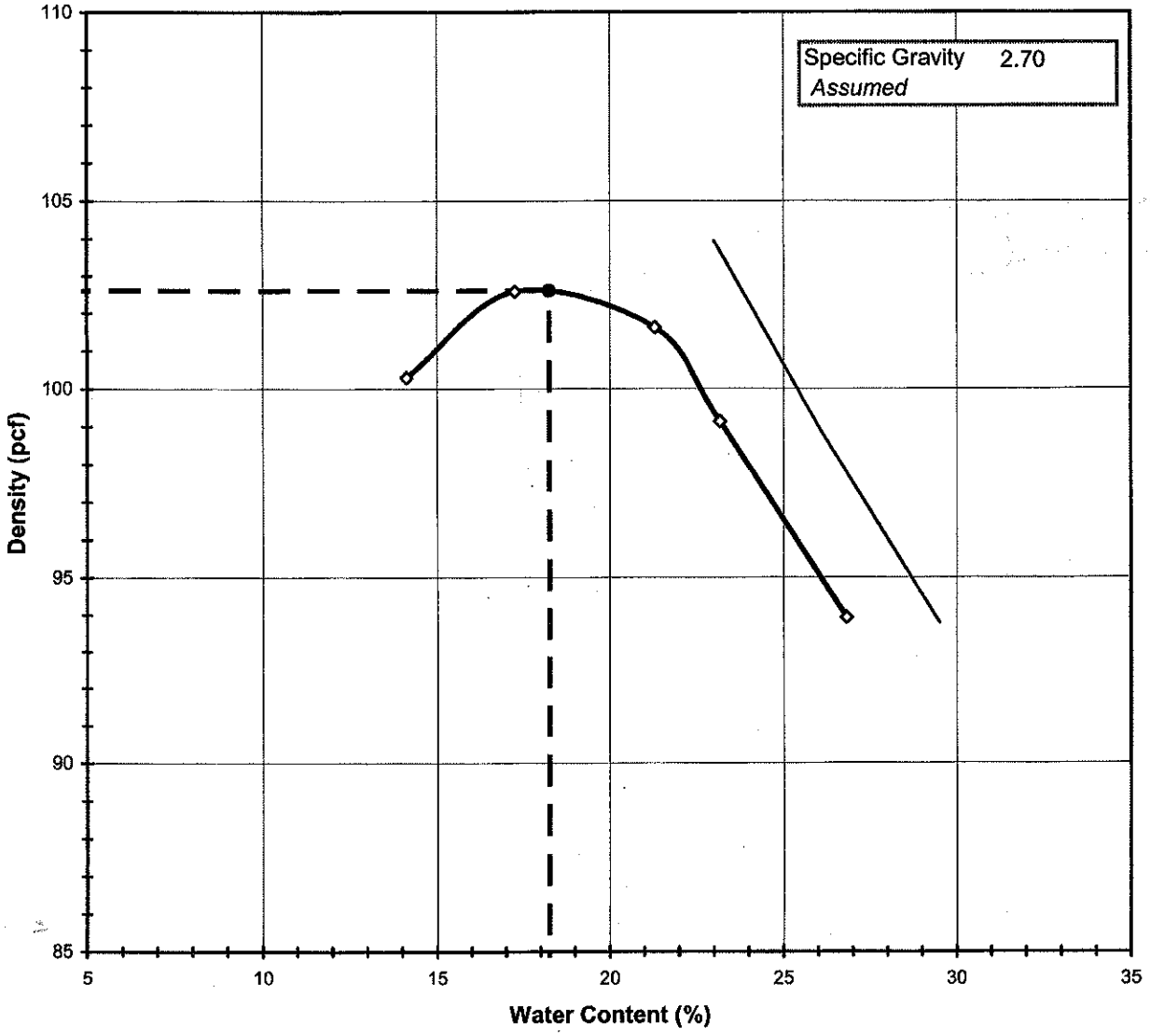
ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 136K
Lab ID	2009-633-01-12	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **18.3**
Maximum Dry Density **102.6**



Tested By AL *Date* 3/3/2009 *Checked By* Gem *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-12 Proctor.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 136K
Lab ID	2009-633-01-12		

Visual Description: BROWN SILTY SAND

Total Weight of the Sample (gm)	22417
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	3
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6039	6127	6171	6154	6109
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1719	1807	1851	1834	1789
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	309	305	398	314	311
Wt. of Tare & WS (gm)	661.70	433.50	613.50	485.10	509.50
Wt. of Tare & DS (gm)	593.43	382.16	520.53	409.76	419.58
Wt. of Tare (gm)	109.90	84.70	84.10	84.60	84.30
Wt. of Water (gm)	68.27	51.34	92.97	75.34	89.92
Wt. of DS (gm)	483.53	297.46	436.43	325.16	335.28
Wet Density (gm/cc)	1.83	1.93	1.98	1.96	1.91
Wet Density (pcf)	114.4	120.3	123.3	122.1	119.1
Moisture Content (%)	**14.1**	**17.3**	**21.3**	**23.2**	**26.8**
Dry Density (pcf)	**100.3**	**102.6**	**101.6**	**99.1**	**93.9**

Zero Air Voids

Moisture Content (%)	23.0	26.0	29.5
Dry Unit Weight (pcf)	103.9	99.0	93.8

Tested By AL *Date* 3/3/2009 *Checked By* GEM *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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INTEGRITY IN TESTING

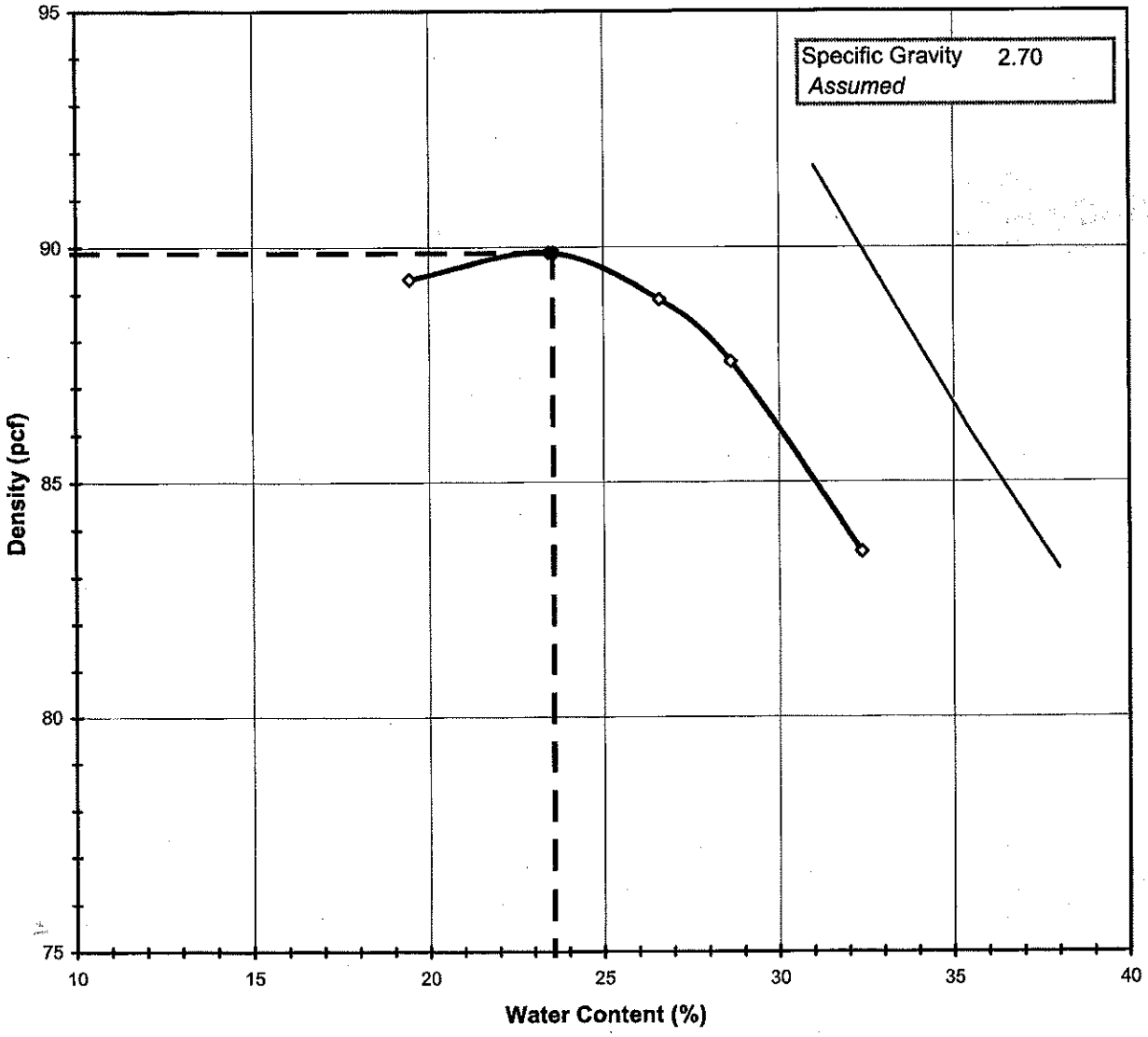
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 140K
Lab ID	2009-633-01-13	Test Method	**STANDARD**

Visual Description LIGHT BROWN SILTY SAND

Optimum Water Content **23.6**
Maximum Dry Density **89.9**



Tested By AL *Date* 3/6/2009 *Checked By* GSM *Date* 3-9-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 140K
Lab ID	2009-633-01-13		

Visual Description: LIGHT BROWN SILTY SAND

Total Weight of the Sample (gm)	17956
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5923	5987	6010	6012	5981
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1603	1667	1690	1692	1661
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	305	317	K-7	315	301
Wt. of Tare & WS (gm)	334.40	392.60	418.70	465.20	385.20
Wt. of Tare & DS (gm)	293.72	334.04	353.89	386.24	311.57
Wt. of Tare (gm)	84.50	84.20	110.20	110.40	84.10
Wt. of Water (gm)	40.68	58.56	64.81	78.96	73.63
Wt. of DS (gm)	209.22	249.84	243.69	275.84	227.47
Wet Density (gm/cc)	1.71	1.78	1.80	1.80	1.77
Wet Density (pcf)	106.7	111.0	112.5	112.6	110.6
Moisture Content (%)	**19.4**	**23.4**	**26.6**	**28.6**	**32.4**
Dry Density (pcf)	**89.3**	**89.9**	**88.9**	**87.6**	**83.5**

Zero Air Voids

Moisture Content (%)	31.0	35.5	38.0
Dry Unit Weight (pcf)	91.7	86.0	83.2

Tested By AL *Date* 3/6/2009 *Checked By* GBM *Date* 3-9-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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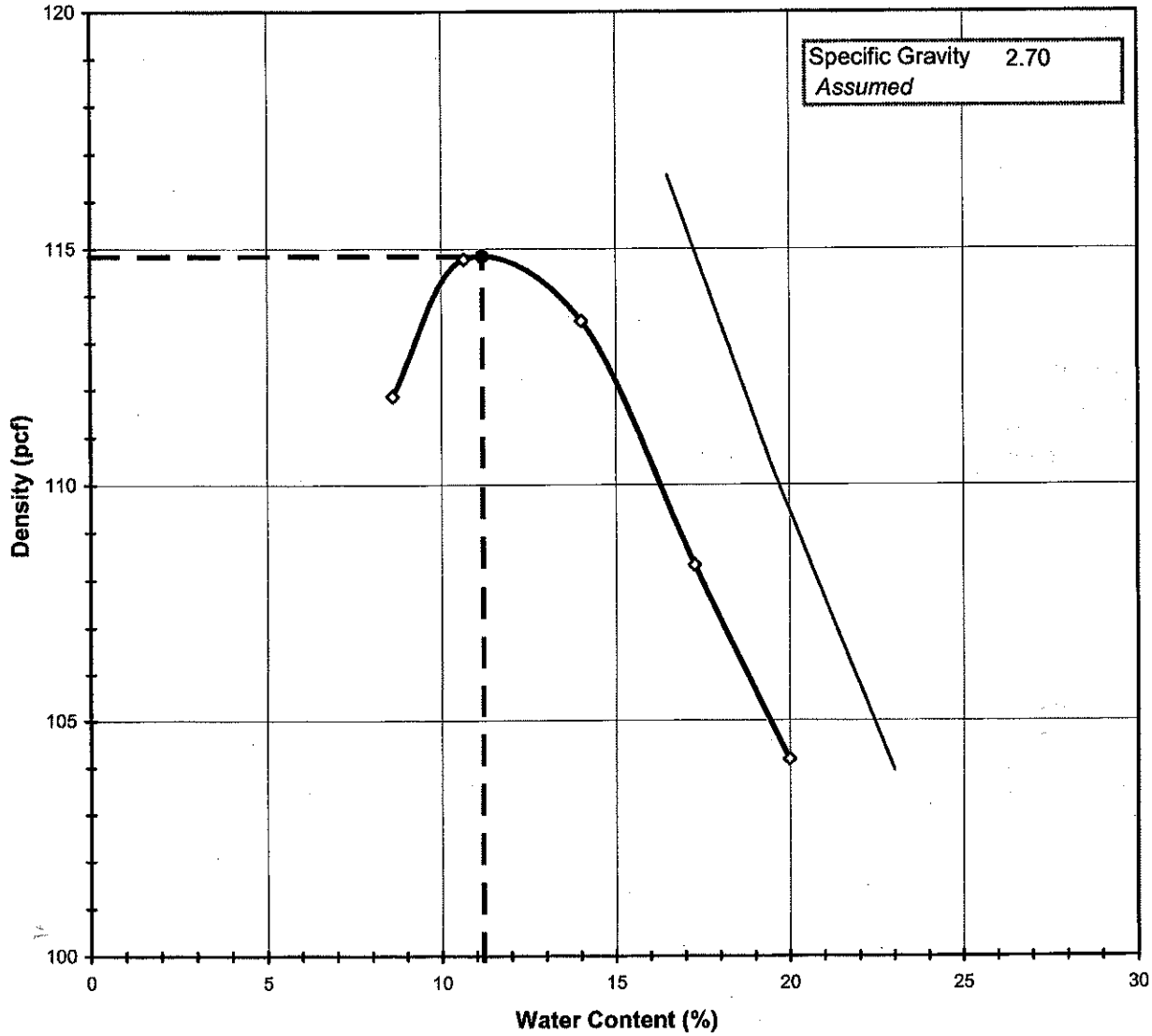
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	SP UNSCREENED
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 144K
Lab ID	2009-633-01-14	Test Method	**STANDARD**

Visual Description BROWN SILTY SAND

Optimum Water Content **11.2**
Maximum Dry Density **114.8**



Tested By AL *Date* 3/5/2009 *Checked By* GEM *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTUCTION CO., INC.	Boring No.	SP UNSCREENED
Client Reference	NORTH WAKE CO. MSE LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 144K
Lab ID	2009-633-01-14		

Visual Description: BROWN SILTY SAND

Total Weight of the Sample (gm)	27408
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	6
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	C

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		5562
Volume of the Mold(cc)		2120

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	9689	9877	9957	9877	9808
Wt.of Mold (gm)	5562	5562	5562	5562	5562
Wt. of WS	4127	4315	4396	4315	4247
Mold Volume (cc)	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number	303	304	312	318	399
Wt. of Tare & WS (gm)	458.20	405.30	423.90	400.70	497.90
Wt. of Tare & DS (gm)	430.72	376.93	382.15	354.47	429.39
Wt. of Tare (gm)	111.00	110.60	84.40	86.70	86.60
Wt. of Water (gm)	27.48	28.37	41.75	46.23	68.51
Wt. of DS (gm)	319.72	266.33	297.75	267.77	342.79

Wet Density (gm/cc)	1.95	2.04	2.07	2.04	2.00
Wet Density (pcf)	121.5	127.0	129.4	127.0	125.0
Moisture Content (%)	**8.6**	**10.7**	**14.0**	**17.3**	**20.0**
Dry Density (pcf)	**111.9**	**114.8**	**113.5**	**108.3**	**104.2**

Zero Air Voids

Moisture Content (%)	16.5	19.5	23.0
Dry Unit Weight (pcf)	116.6	110.4	103.9

Tested By AL *Date* 3/5/2009 *Checked By* GEM *Date* 3-6-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
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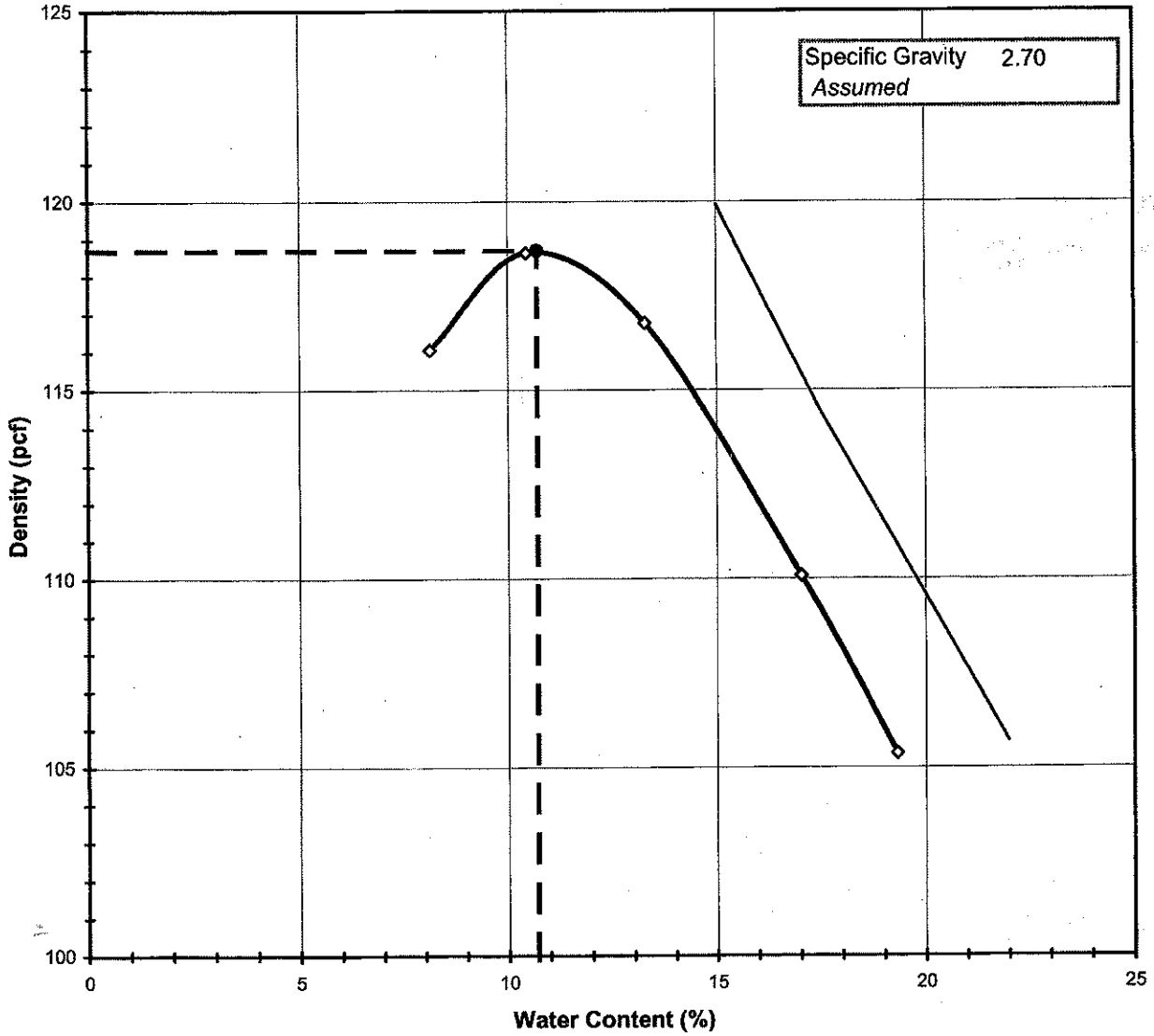
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	SP UNSCREENED
Client Reference	NORTHWAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 148K
Lab ID	2009-633-01-15	Test Method	**STANDARD**

Visual Description: BROWN SILTY SAND WITH GRAVEL

Optimum Water Content **10.7**
Maximum Dry Density **118.7**



Tested By AL *Date* 3/4/2009 *Checked By* GEM *Date* 3-9-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	SP UNSCREENED
Client Reference	NORTHWAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 148K
Lab ID	2009-633-01-15		

Visual Description: BROWN SILTY SAND WITH GRAVEL

Total Weight of the Sample (gm)	28391
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	11
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	C

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	173
Mold diameter		6
Weight of the Mold		5562
Volume of the Mold(cc)		2121

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	9826	10014	10056	9939	9834
Wt.of Mold (gm)	5562	5562	5562	5562	5562
Wt. of WS	4265	4453	4495	4377	4272
Mold Volume (cc)	2121	2121	2121	2121	2121

Moisture Content / Density

Tare Number	301	317	K-7	300	315
Wt. of Tare & WS (gm)	508.50	508.30	496.60	497.90	484.00
Wt. of Tare & DS (gm)	476.63	468.19	451.31	441.61	423.51
Wt. of Tare (gm)	84.30	84.10	110.20	111.00	110.40
Wt. of Water (gm)	31.87	40.11	45.29	56.29	60.49
Wt. of DS (gm)	392.33	384.09	341.11	330.61	313.11
Wet Density (gm/cc)	2.01	2.10	2.12	2.06	2.01
Wet Density (pcf)	125.5	131.0	132.3	128.8	125.7
Moisture Content (%)	**8.1**	**10.4**	**13.3**	**17.0**	**19.3**
Dry Density (pcf)	**116.1**	**118.6**	**116.8**	**110.1**	**105.4**

Zero Air Voids

Moisture Content (%)	15.0	17.5	22.0
Dry Unit Weight (pcf)	119.9	114.4	105.7

Tested By AL *Date* 3/4/2009 *Checked By* [signature] *Date* 3-9-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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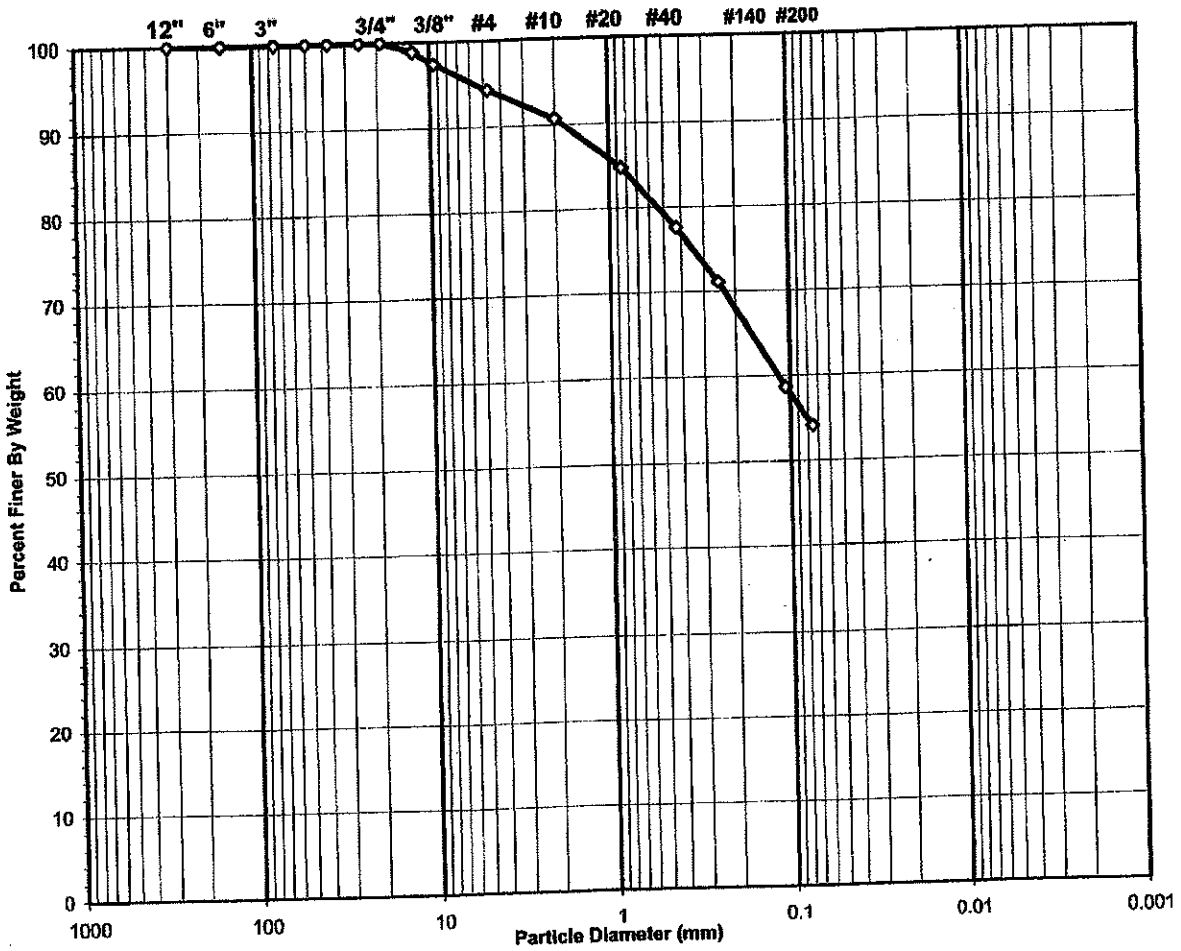
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC4K
Lab ID	2008-606-04-03	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By JBD Date 8/14/2008 Checked By Gem Date 8-26-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC4K
Lab ID	2008-606-04-03	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	200	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	777.18	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	693.68	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.81	Weight of Tare (gm)	NA
Weight of Water (gm)	83.50	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	521.87	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**16.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	521.87
Dry Weight - 3/4" Sample (gm)	239.5	Weight of minus #200 material (gm)	282.34
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	239.53
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	5.82	1.1	1.1	98.9	98.9
3/8"	9.50	7.44	1.4	2.5	97.5	97.5
#4	4.75	16.39	3.1	5.7	94.3	94.3
#10	2.00	18.77	3.6	9.3	90.7	90.7
#20	0.850	31.24	6.0	15.3	84.7	84.7
#40	0.425	37.14	7.1	22.4	77.6	77.6
#60	0.250	33.85	6.5	28.9	71.1	71.1
#140	0.106	64.96	12.4	41.3	58.7	58.7
#200	0.075	23.92	4.6	45.9	54.1	54.1
Pan	-	282.34	54.1	100.0	-	-

Tested By JBD Date 8/14/2008 Checked By GEM Date 8/20/08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
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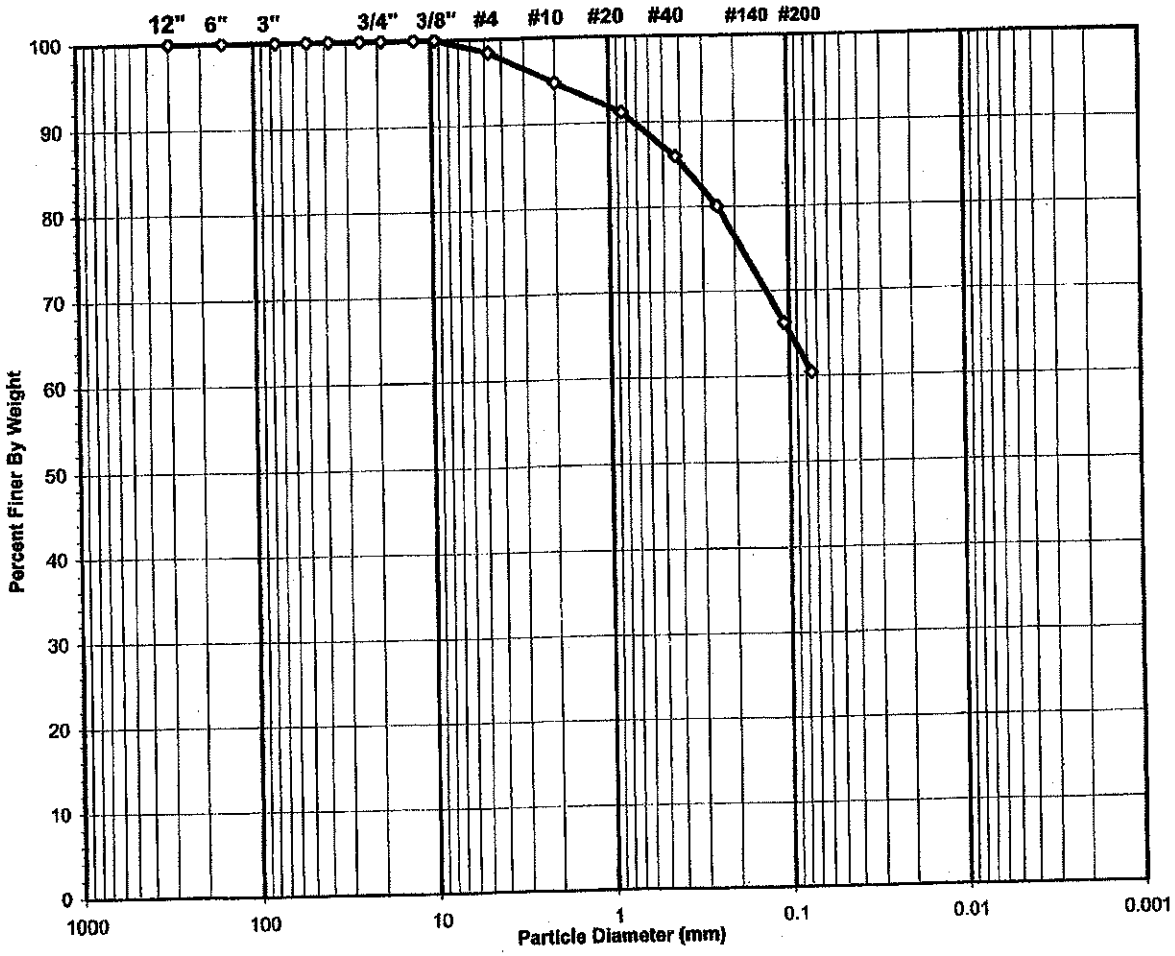
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC8K
Lab ID	2008-606-04-04	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By JBD Date 8/14/2008 Checked By GEM Date 8-18-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC8K
Lab ID	2008-606-04-04	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	214	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	783.59	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	705.00	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.34	Weight of Tare (gm)	NA
Weight of Water (gm)	78.59	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	533.66	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	533.66
Dry Weight - 3/4" Sample (gm)	211.2	Weight of minus #200 material (gm)	322.43
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	211.23
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	8.24	1.5	1.5	98.5	**98.5**
#10	2.00	19.48	3.7	5.2	94.8	**94.8**
#20	0.850	19.32	3.6	8.8	91.2	**91.2**
#40	0.425	28.01	5.2	14.1	85.9	**85.9**
#60	0.250	31.47	5.9	20.0	80.0	**80.0**
#140	0.106	73.59	13.8	33.7	66.3	**66.3**
#200	0.075	31.12	5.8	39.6	60.4	**60.4**
Pan	-	322.43	60.4	100.0	-	-

Tested By JBD Date 8/14/2008 Checked By GBM Date 8-18-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-04-04 SIEVON REV 4.XLS]Sheet1

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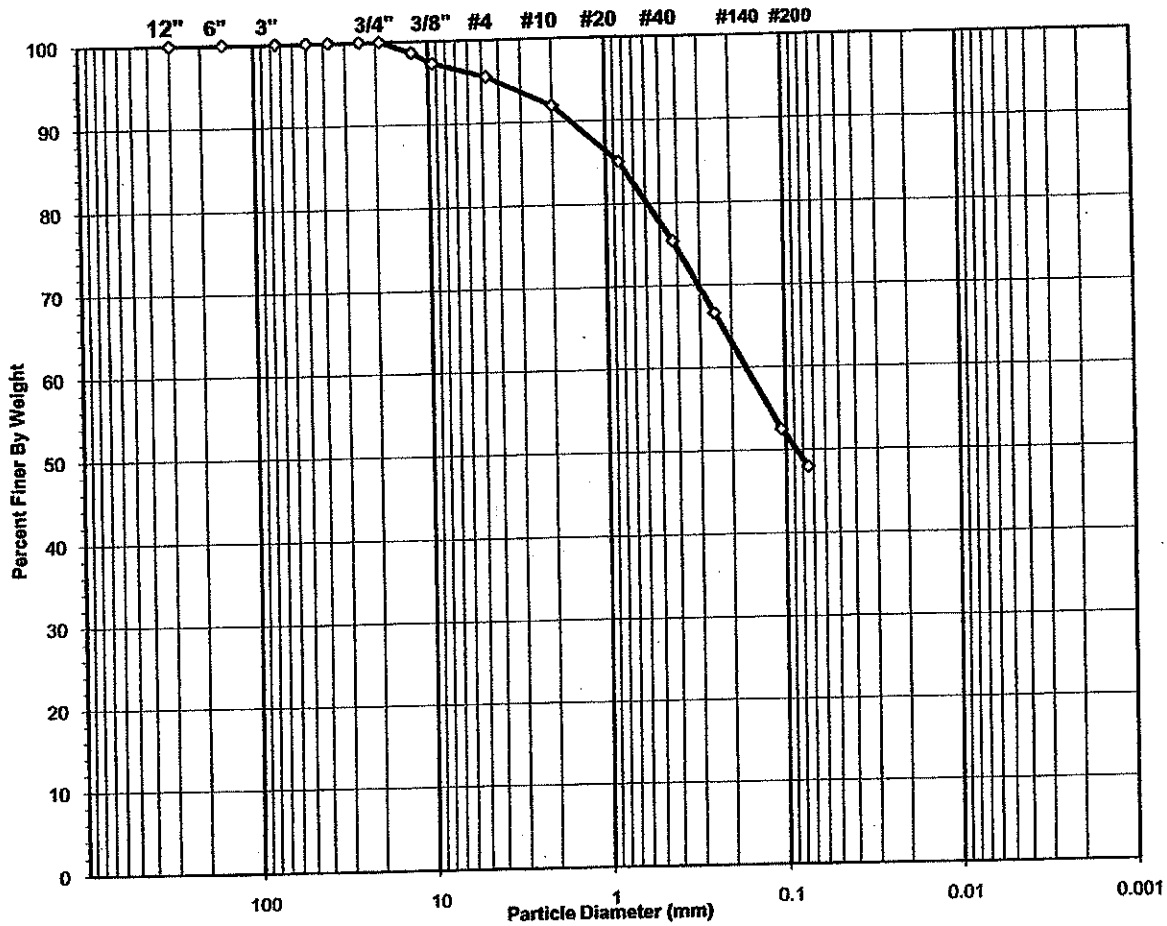
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC12K
Lab ID	2008-606-05-01	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By S.D. Date 8/21/2008 Checked By JRB Date 8.22.08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\2008-606-05-01 SIEVE.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC12K
Lab ID	2008-606-05-01	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	212	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	836.62	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	755.54	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.53	Weight of Tare (gm)	NA
Weight of Water (gm)	81.08	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	584.01	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**13.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	584.01
Dry Weight - 3/4" Sample (gm)	304.1	Weight of minus #200 material (gm)	279.92
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	304.09
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	7.81	1.3	1.3	98.7	**98.7**
3/8"	9.50	7.96	1.4	2.7	97.3	**97.3**
#4	4.75	9.94	1.7	4.4	95.6	**95.6**
#10	2.00	21.32	3.7	8.1	91.9	**91.9**
#20	0.850	40.11	6.9	14.9	85.1	**85.1**
#40	0.425	56.31	9.6	24.6	75.4	**75.4**
#60	0.250	51.54	8.8	33.4	66.6	**66.6**
#140	0.106	82.39	14.1	47.5	52.5	**52.5**
#200	0.075	26.71	4.6	52.1	47.9	**47.9**
Pan	-	279.92	47.9	100.0	-	-

Tested By S.D. Date 8/21/2008 Checked By Date

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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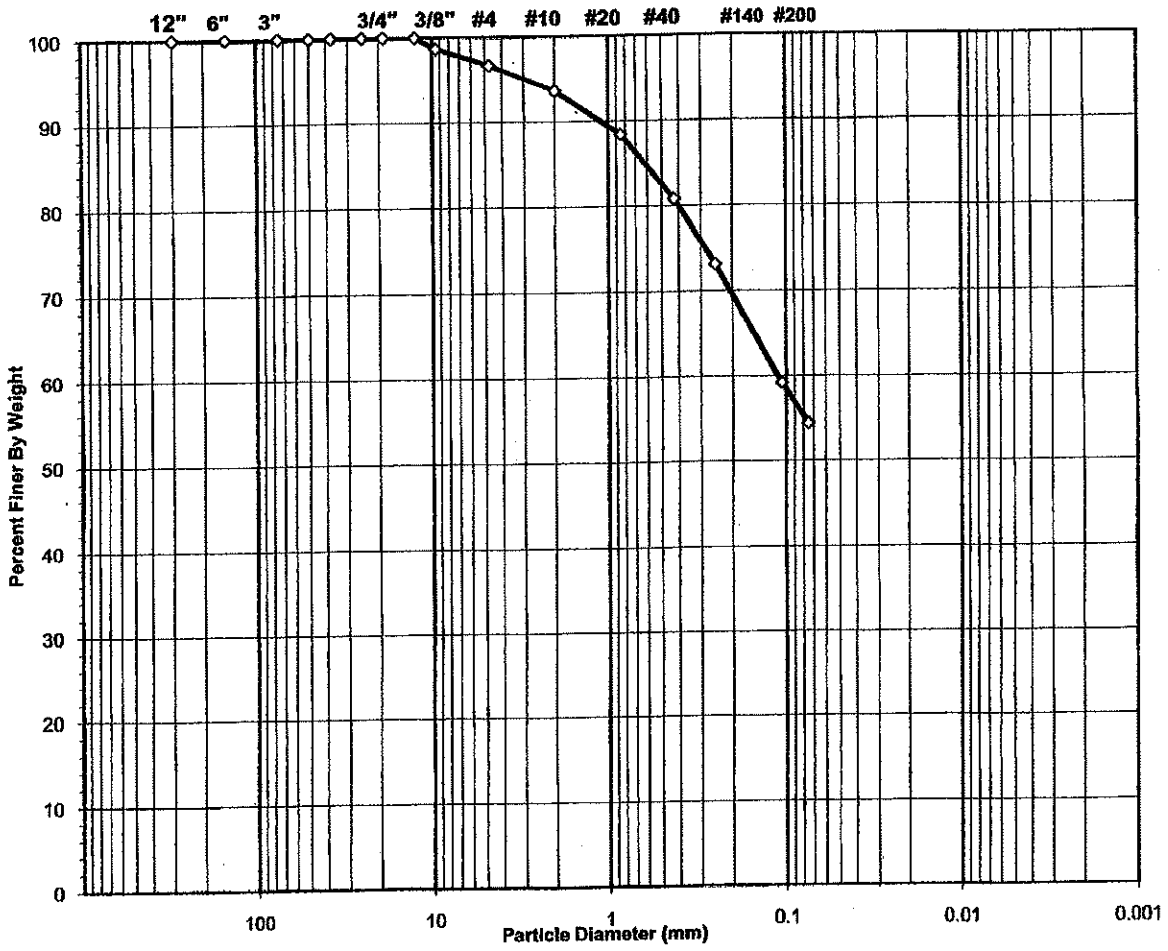
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC16K
Lab ID	2008-606-05-02	Soil Color	**DARK BROWN**

	SIEVE ANALYSIS		HYDROMETER
USCS	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By S.D. Date 8/21/2008 Checked By JRB Date 8.28.08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC16K
Lab ID	2008-606-05-02	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	201	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	843.57	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	763.92	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	170.73	Weight of Tare (gm)	NA
Weight of Water (gm)	79.65	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	593.19	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**13.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	593.19
Dry Weight - 3/4" Sample (gm)	270.5	Weight of minus #200 material (gm)	322.67
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	270.52
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	7.89	1.3	1.3	98.7	**98.7**
#4	4.75	11.97	2.0	3.3	96.7	**96.7**
#10	2.00	18.01	3.0	6.4	93.6	**93.6**
#20	0.850	31.05	5.2	11.6	88.4	**88.4**
#40	0.425	45.17	7.6	19.2	80.8	**80.8**
#60	0.250	45.51	7.7	26.9	73.1	**73.1**
#140	0.106	82.52	13.9	40.8	59.2	**59.2**
#200	0.075	28.40	4.8	45.6	54.4	**54.4**
Pan	-	322.67	54.4	100.0	-	-

Tested By S.D. Date 8/21/2008 Checked By JRB Date 8.28.08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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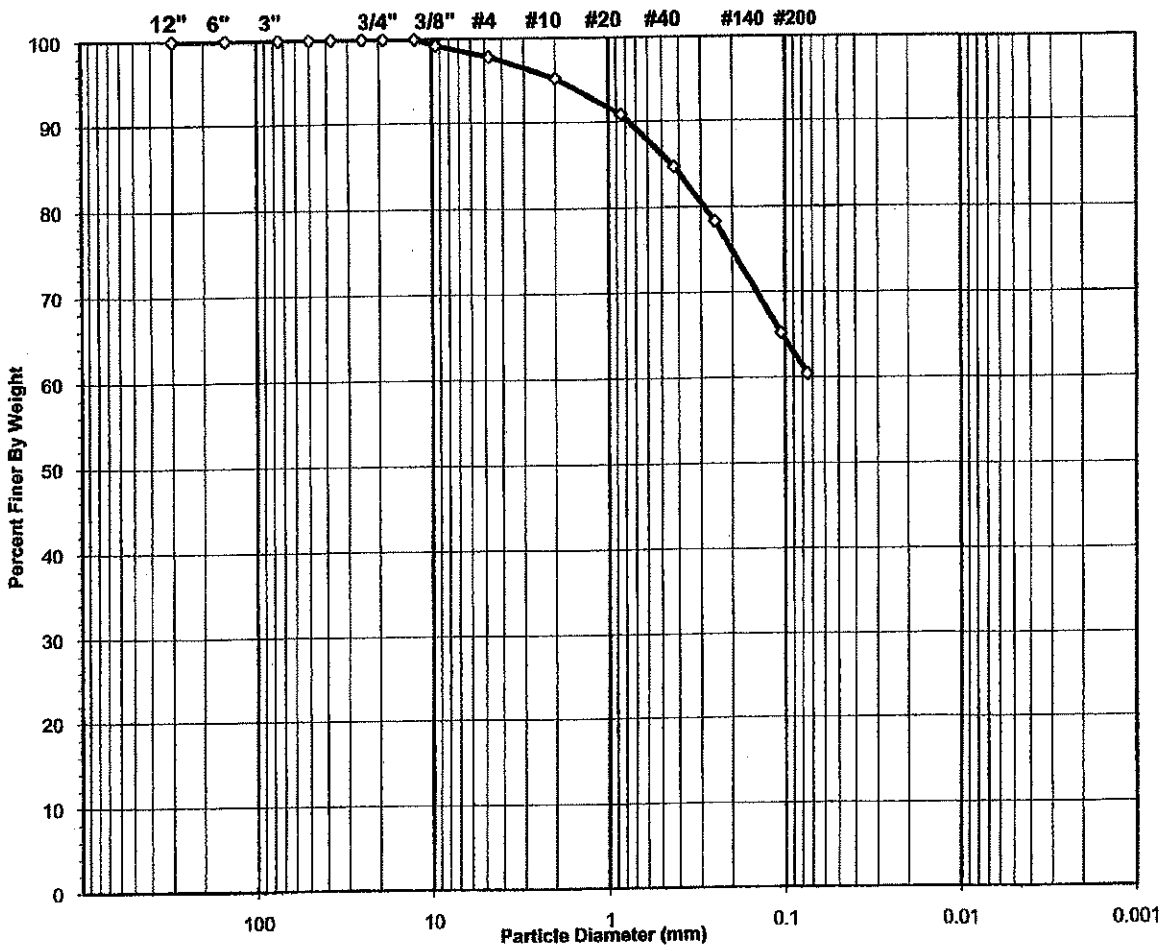
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC20K
Lab ID	2008-606-05-03	Soil Color	**RED/BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By S.D. Date 8/21/2008 Checked By JRB Date 8.28.08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC20K
Lab ID	2008-606-05-03	Soil Color	**RED/BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	209	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	931.16	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	809.45	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.70	Weight of Tare (gm)	NA
Weight of Water (gm)	121.71	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	637.75	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	637.75
Dry Weight - 3/4" Sample (gm)	252.4	Weight of minus #200 material (gm)	385.37
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	252.38
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	4.67	0.7	0.7	99.3	**99.3**
#4	4.75	9.15	1.4	2.2	97.8	**97.8**
#10	2.00	16.40	2.6	4.7	95.3	**95.3**
#20	0.850	27.91	4.4	9.1	90.9	**90.9**
#40	0.425	39.56	6.2	15.3	84.7	**84.7**
#60	0.250	40.58	6.4	21.7	78.3	**78.3**
#140	0.106	83.72	13.1	34.8	65.2	**65.2**
#200	0.075	30.39	4.8	39.6	60.4	**60.4**
Pan	-	385.37	60.4	100.0	-	-

Tested By S.D. Date 8/21/2008 Checked By JRB Date 8.28.08

DCN: CT-93C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC24K
Lab ID	2008-606-07-01	Soil Color	**DARK BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**

USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By S.D. Date 8.29.08 Checked By GEM Date 9-4-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC24K
Lab ID	2008-606-07-01	Soil Color	**DARK BROWN**

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)	670.58	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	606.17	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	197.39	Weight of Tare (gm)	NA
Weight of Water (gm)	64.41	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	408.78	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	408.78
Dry Weight - 3/4" Sample (gm)	210.2	Weight of minus #200 material (gm)	198.63
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	210.15
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	10.98	2.7	2.7	97.3	**97.3**
#4	4.75	9.89	2.4	5.1	94.9	**94.9**
#10	2.00	16.16	4.0	9.1	90.9	**90.9**
#20	0.850	29.26	7.2	16.2	83.8	**83.8**
#40	0.425	37.47	9.2	25.4	74.6	**74.6**
#60	0.250	33.46	8.2	33.6	66.4	**66.4**
#140	0.106	54.79	13.4	47.0	53.0	**53.0**
#200	0.075	18.14	4.4	51.4	48.6	**48.6**
Pan	-	198.63	48.6	100.0	-	-

Tested By S.D. Date 8.29.08 Checked By GEM Date 9-4-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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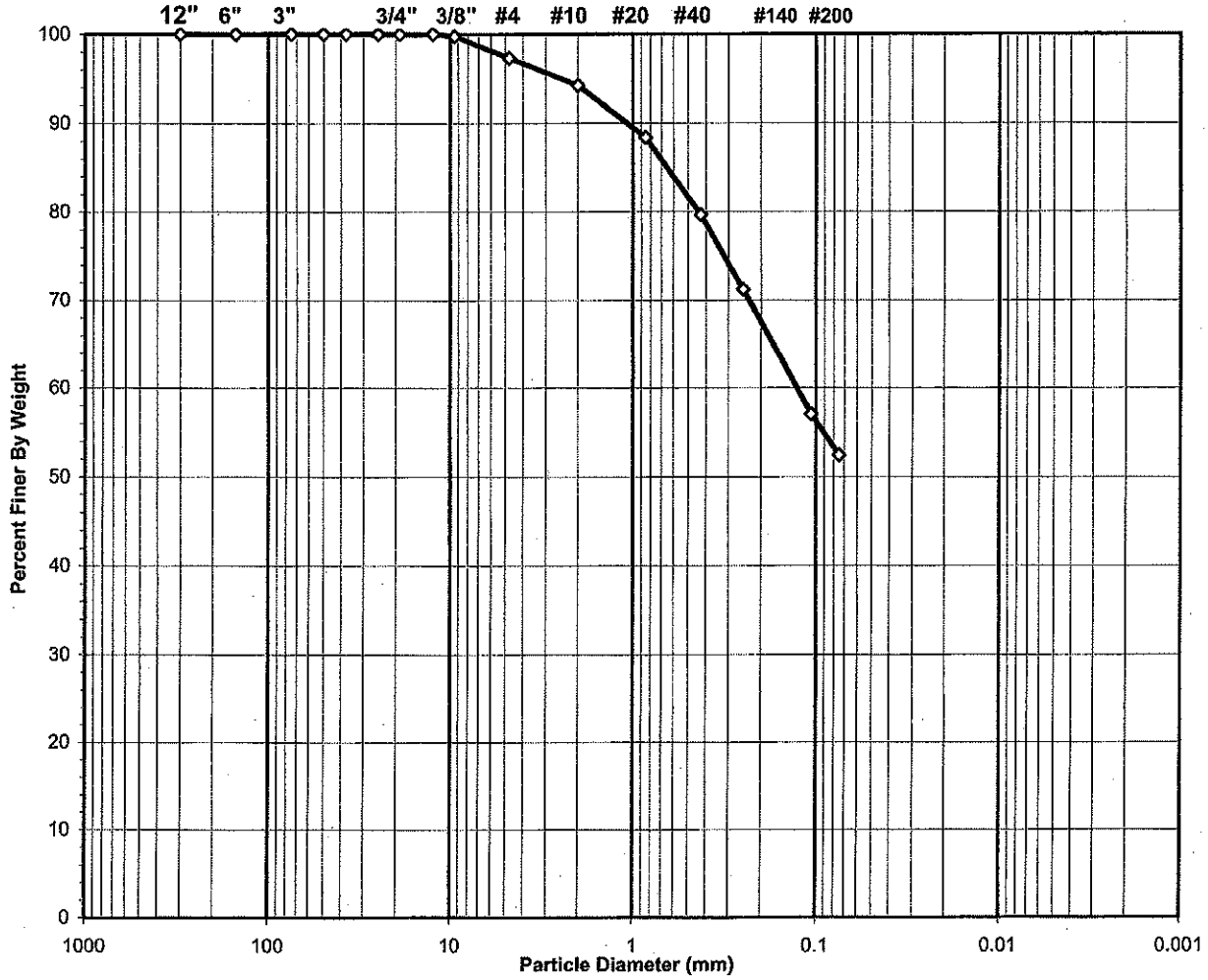
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC28K
Lab ID	2008-606-07-02	Soil Color	**DARK BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By S.D. Date 8.29.08 Checked By GBM Date 9-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC28K
Lab ID	2008-606-07-02	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	397	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	809.58	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	729.31	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	208.35	Weight of Tare (gm)	NA
Weight of Water (gm)	80.27	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	520.96	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	520.96
Dry Weight - 3/4" Sample (gm)	247.9	Weight of minus #200 material (gm)	273.06
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	247.90
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	1.15	0.2	0.2	99.8	**99.8**
#4	4.75	12.78	2.5	2.7	97.3	**97.3**
#10	2.00	16.21	3.1	5.8	94.2	**94.2**
#20	0.850	30.45	5.8	11.6	88.4	**88.4**
#40	0.425	45.61	8.8	20.4	79.6	**79.6**
#60	0.250	43.88	8.4	28.8	71.2	**71.2**
#140	0.106	73.79	14.2	43.0	57.0	**57.0**
#200	0.075	24.03	4.6	47.6	52.4	**52.4**
Pan	-	273.06	52.4	100.0	-	-

Tested By S.D. Date 8.29.08 Checked By [signature] Date 9-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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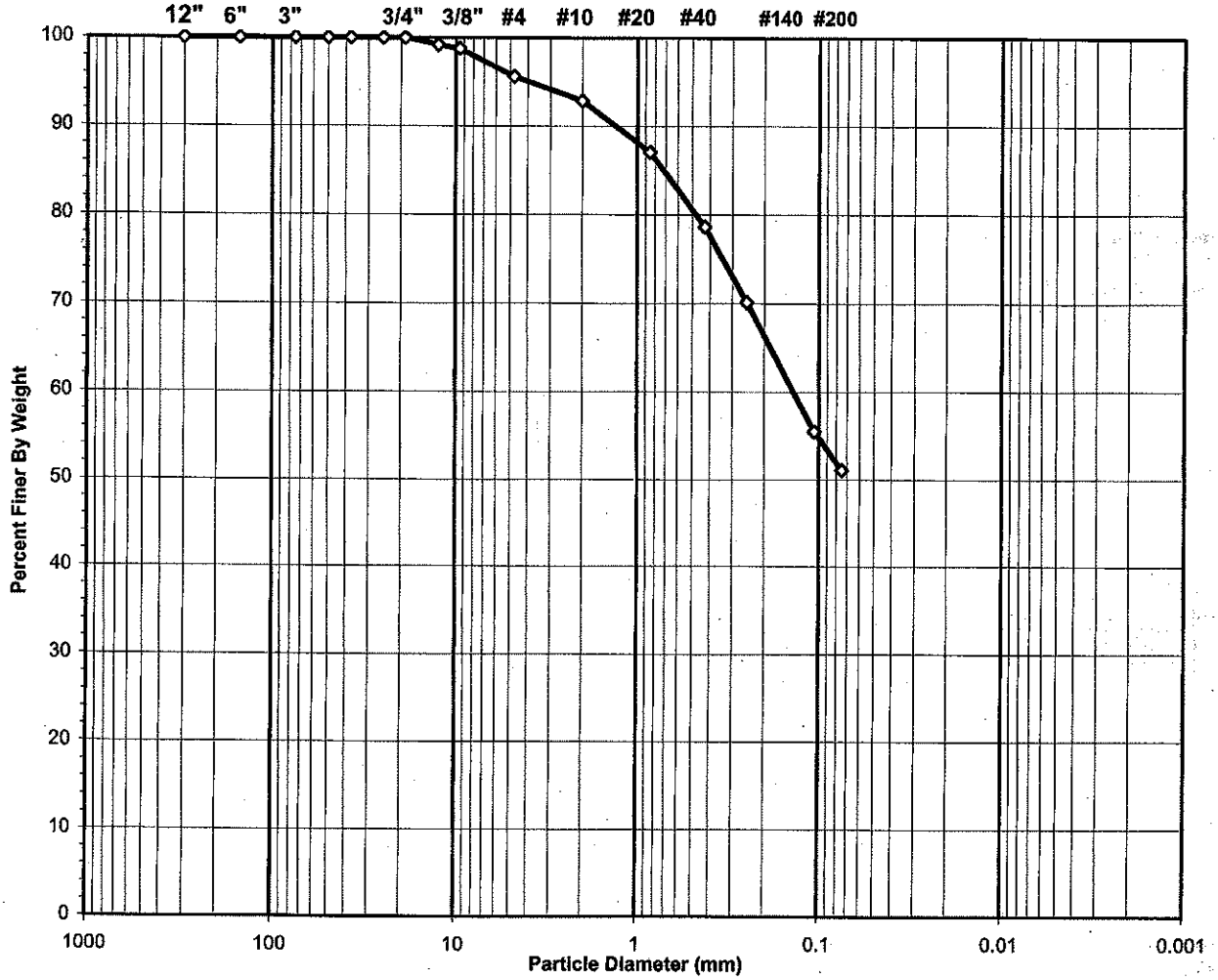
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC32K
Lab ID	2008-606-08-01	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By SD Date 9/4/2008 Checked By GEM Date 9-12-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC32K
Lab ID	2008-606-08-01	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	317	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	716.10	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	692.25	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	84.10	Weight of Tare (gm)	NA
Weight of Water (gm)	23.85	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	608.15	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**3.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	608.15
Dry Weight - 3/4" Sample (gm)	297.7	Weight of minus #200 material (gm)	310.45
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	297.70
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	4.92	0.8	0.8	99.2	**99.2**
3/8"	9.50	2.65	0.4	1.2	98.8	**98.8**
#4	4.75	19.15	3.1	4.4	95.6	**95.6**
#10	2.00	16.87	2.8	7.2	92.8	**92.8**
#20	0.850	35.25	5.8	13.0	87.0	**87.0**
#40	0.425	51.12	8.4	21.4	78.6	**78.6**
#60	0.250	51.72	8.5	29.9	70.1	**70.1**
#140	0.106	89.14	14.7	44.5	55.5	**55.5**
#200	0.075	26.88	4.4	49.0	51.0	**51.0**
Pan	-	310.45	51.0	100.0	-	-

Tested By SD Date 9/4/2008 Checked By GEM Date 9-12-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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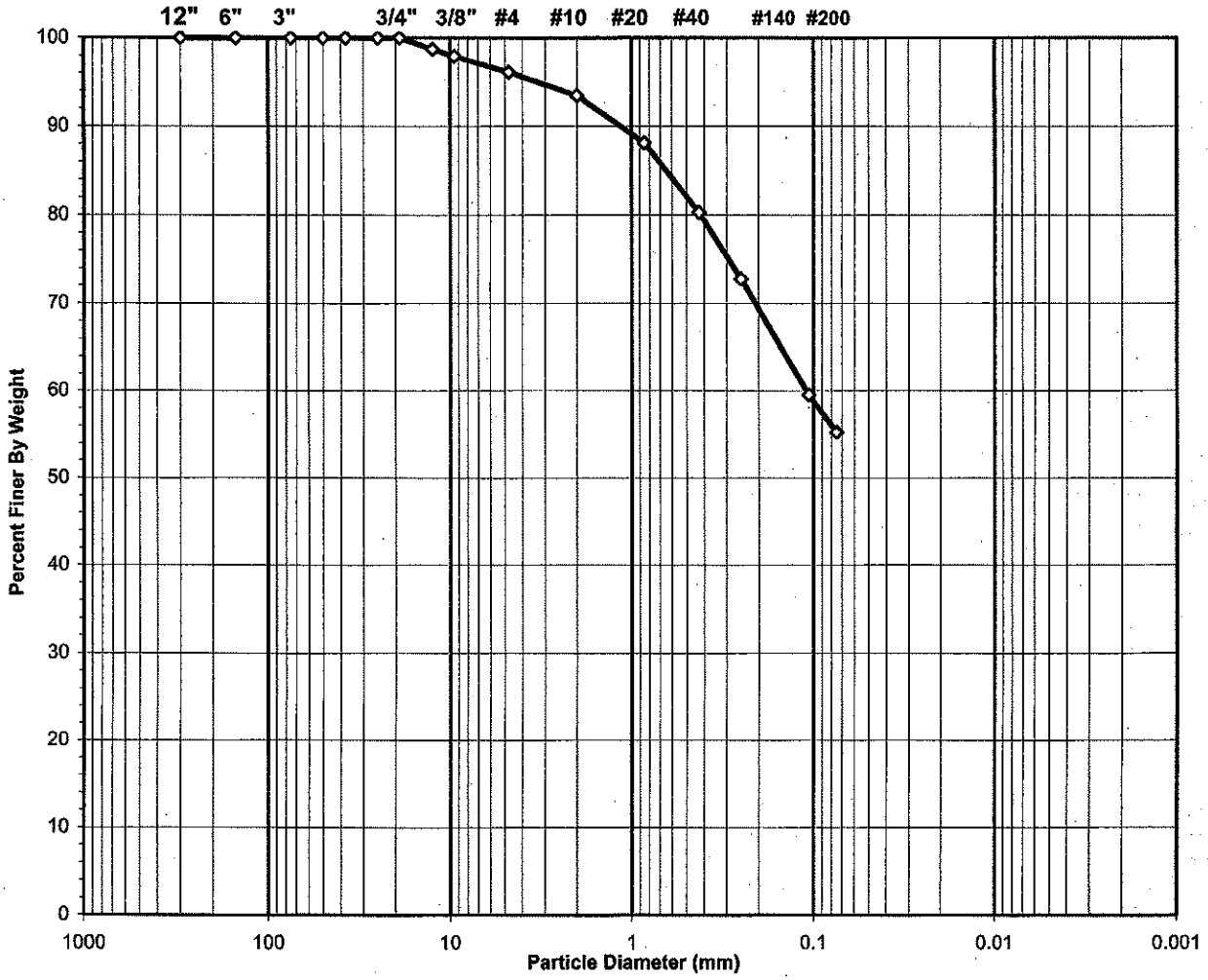
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO.,INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC36K
Lab ID	2008-606-08-02	Soil Color	**DARK BROWN**

USCS	*SIEVE ANALYSIS*		*HYDROMETER*
	gravel	sand	silt and clay



USCS Symbol ***ML, TESTED***

USCS Classification ***SANDY SILT***

Tested By SD Date 9/4/2008 Checked By GBM Date 9-10-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-02 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO.,INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC36K
Lab ID	2008-606-08-02	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	319	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	790.66	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	760.05	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	209.09	Weight of Tare (gm)	NA
Weight of Water (gm)	30.61	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	550.96	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**5.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	550.96
Dry Weight - 3/4" Sample (gm)	246.6	Weight of minus #200 material (gm)	304.32
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	246.64
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	6.95	1.3	1.3	98.7	**98.7**
3/8"	9.50	4.51	0.8	2.1	97.9	**97.9**
#4	4.75	10.00	1.8	3.9	96.1	**96.1**
#10	2.00	14.72	2.7	6.6	93.4	**93.4**
#20	0.850	29.41	5.3	11.9	88.1	**88.1**
#40	0.425	42.89	7.8	19.7	80.3	**80.3**
#60	0.250	41.58	7.5	27.2	72.8	**72.8**
#140	0.106	73.10	13.3	40.5	59.5	**59.5**
#200	0.075	23.48	4.3	44.8	55.2	**55.2**
Pan	-	304.32	55.2	100.0	-	-

Tested By SD Date 9/4/2008 Checked By Gem Date 9-10-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-02 SIEVON REV 4.XLS]Sheet1*

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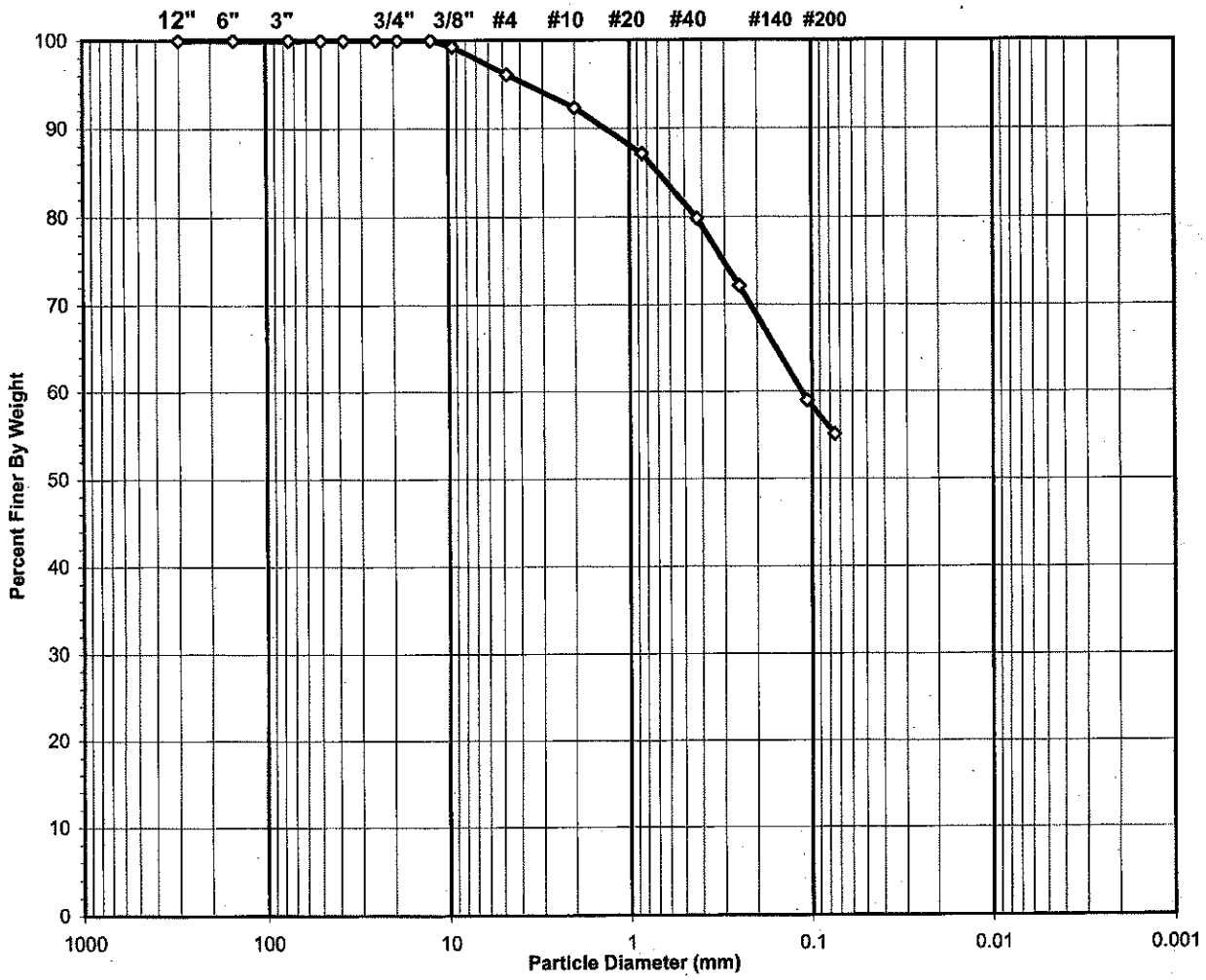
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-09	Sample No.	PC-40K
Lab ID	2008-606-09-01	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By SD Date 9/18/2008 Checked By GEM Date 9-22-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-09-01 SIEVON REV 4.XLS]Sheet1*

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INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-09	Sample No.	PC-40K
Lab ID	2008-606-09-01	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	215	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	805.49	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	712.81	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	172.32	Weight of Tare (gm)	NA
Weight of Water (gm)	92.68	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	540.49	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**17.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	540.49
Dry Weight - 3/4" Sample (gm)	242.7	Weight of minus #200 material (gm)	297.80
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	242.69
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	3.76	0.7	0.7	99.3	**99.3**
#4	4.75	17.28	3.2	3.9	96.1	**96.1**
#10	2.00	20.36	3.8	7.7	92.3	**92.3**
#20	0.850	28.41	5.3	12.9	87.1	**87.1**
#40	0.425	39.23	7.3	20.2	79.8	**79.8**
#60	0.250	41.48	7.7	27.8	72.2	**72.2**
#140	0.106	71.38	13.2	41.1	58.9	**58.9**
#200	0.075	20.79	3.8	44.9	55.1	**55.1**
Pan	-	297.80	55.1	100.0	-	-

Tested By SD Date 9/18/2008 Checked By GBM Date 9-22-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	2
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-02	Soil Color	**BROWN RED**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By JP Date 9/26/2008 Checked By GBM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	2
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-02	Soil Color	**BROWN RED**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	820	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	816.80	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	690.53	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	208.20	Weight of Tare (gm)	22.00
Weight of Water (gm)	126.27	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	482.33	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**26.2**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	20535.4	Weight of the Dry Specimen (gm)	482.33
Dry Weight - 3/4" Sample (gm)	16274.8	Weight of minus #200 material (gm)	285.41
Wet Weight +3/4" Sample (gm)	1072.11	Weight of plus #200 material (gm)	196.92
Dry Weight + 3/4" Sample (gm)	1072.11		
Total Dry Weight Sample (gm)	17346.9	**J - Factor (Percent Finer than 3/4")**	**0.9382**

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	70.22		0.4	0.4	99.6	**99.6**
1"	25	632.68		3.6	4.1	95.9	**95.9**
3/4"	19	369.21		2.1	6.2	93.8	**93.8**
1/2"	12.5	0.00		0.0	0.0	100.0	**93.8**
3/8"	9.5	0.00		0.0	0.0	100.0	**93.8**
#4	4.75	0.00		0.0	0.0	100.0	**93.8**
#10	2	48.51		10.1	10.1	89.9	**84.4**
#20	0.85	13.37	(**)	2.8	12.8	87.2	**81.8**
#40	0.425	10.75		2.2	15.1	84.9	**79.7**
#60	0.25	19.01		3.9	19.0	81.0	**76.0**
#140	0.106	79.50		16.5	35.5	64.5	**60.5**
#200	0.075	25.78		5.3	40.8	59.2	**55.5**
Pan	-	285.41		59.2	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/26/2008 Checked By GEM Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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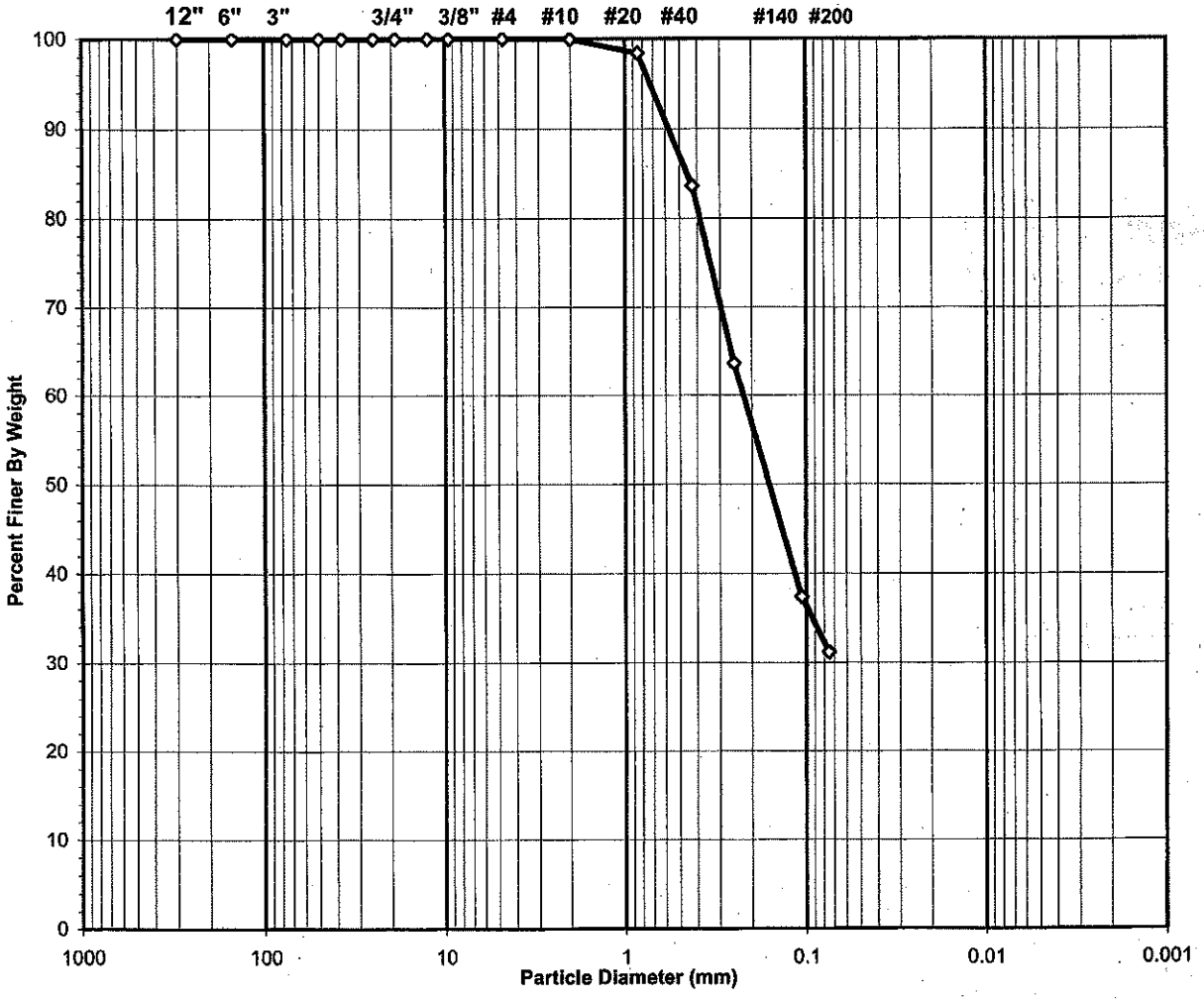
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	3
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-03	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/26/2008 Checked By GEM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	3
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-03	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	211	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	748.34	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	699.40	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	171.21	Weight of Tare (gm)	22.00
Weight of Water (gm)	48.94	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	528.19	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**9.3**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	13941.2	Weight of the Dry Specimen (gm)	528.19
Dry Weight - 3/4" Sample (gm)	12759.0	Weight of minus #200 material (gm)	164.61
Wet Weight +3/4" Sample (gm)	0.00	Weight of plus #200 material (gm)	363.58
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	12759.0	**J - Factor (Percent Finer than 3/4")**	**1.0000**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	0.00		0.0	0.0	100.0	**100.0**
1/2"	12.5	0.00		0.0	0.0	100.0	**100.0**
3/8"	9.5	0.00		0.0	0.0	100.0	**100.0**
#4	4.75	0.00		0.0	0.0	100.0	**100.0**
#10	2	0.35		0.1	0.1	99.9	**99.9**
#20	0.85	8.04	(**)	1.5	1.6	98.4	**98.4**
#40	0.425	78.03		14.8	16.4	83.6	**83.6**
#60	0.25	105.76		20.0	36.4	63.6	**63.6**
#140	0.106	138.84		26.3	62.7	37.3	**37.3**
#200	0.075	32.56		6.2	68.8	31.2	**31.2**
Pan	-	164.61		31.2	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/26/2008 Checked By Gem Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	3
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-04	Soil Color	**DARK BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By JP Date 9/26/2008 Checked By Gen Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	3
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-04	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	215	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	802.80	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	681.23	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	172.20	Weight of Tare (gm)	22.00
Weight of Water (gm)	121.57	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	509.03	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**23.9**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	17477.2	Weight of the Dry Specimen (gm)	509.03
Dry Weight - 3/4" Sample (gm)	14107.9	Weight of minus #200 material (gm)	281.78
Wet Weight +3/4" Sample (gm)	707.40	Weight of plus #200 material (gm)	227.25
Dry Weight + 3/4" Sample (gm)	707.40		
Total Dry Weight Sample (gm)	14815.3	**J - Factor (Percent Finer than 3/4")**	**0.9523**

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	473.60		3.2	3.2	96.8	**96.8**
3/4"	19	233.80		1.6	4.8	95.2	**95.2**
1/2"	12.5	0.00		0.0	0.0	100.0	**95.2**
3/8"	9.5	0.00		0.0	0.0	100.0	**95.2**
#4	4.75	0.00		0.0	0.0	100.0	**95.2**
#10	2	73.36		14.4	14.4	85.6	**81.5**
#20	0.85	16.46	(**)	3.2	17.6	82.4	**78.4**
#40	0.425	12.45		2.4	20.1	79.9	**76.1**
#60	0.25	19.69		3.9	24.0	76.0	**72.4**
#140	0.106	77.27		15.2	39.1	60.9	**58.0**
#200	0.075	28.02		5.5	44.6	55.4	**52.7**
Pan	-	281.78		55.4	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/26/2008 Checked By Gen Date 10-1-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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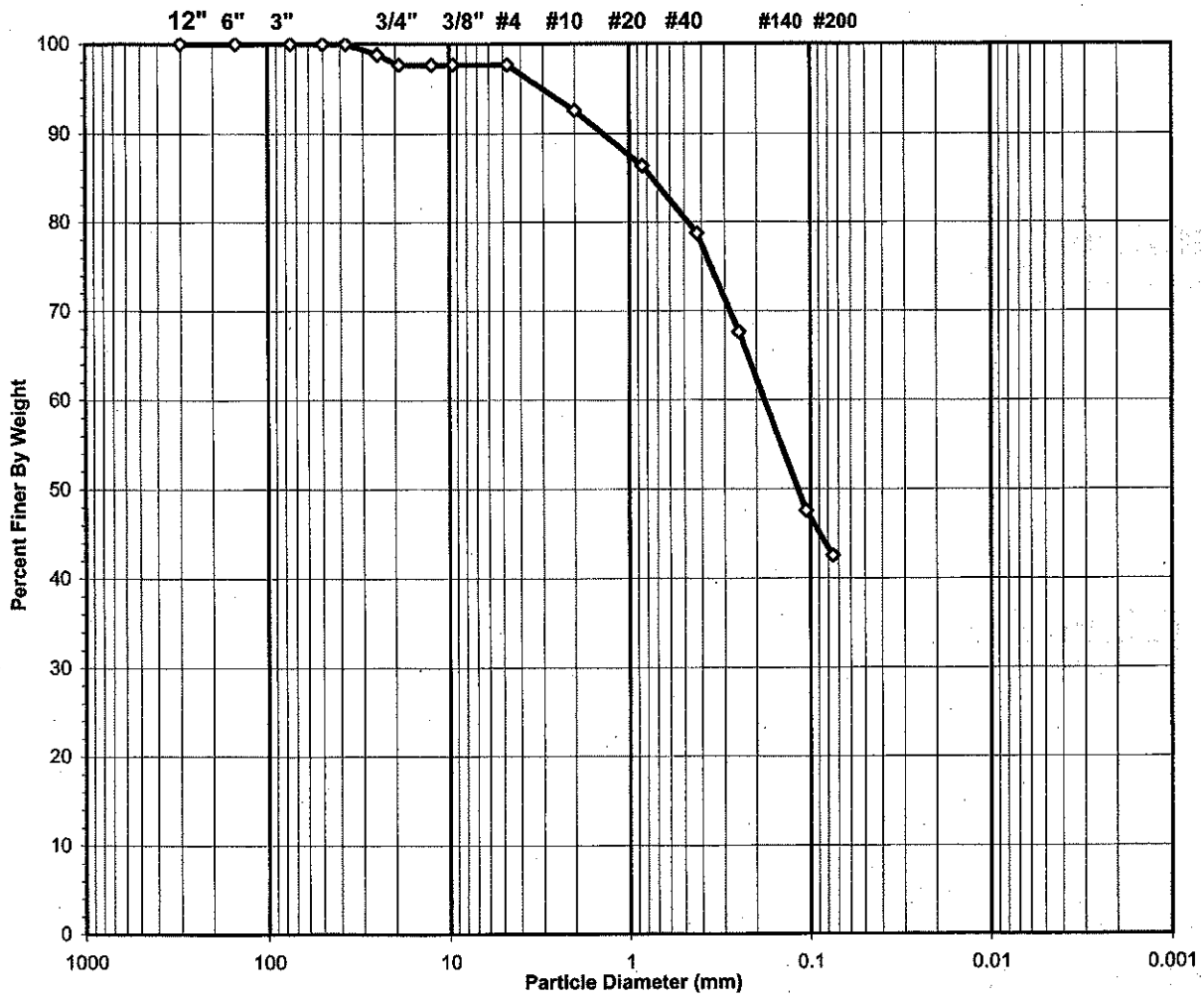
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	5
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-05	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/26/2008 Checked By Gam Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	5
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-05	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	208	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	842.50	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	726.98	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	169.20	Weight of Tare (gm)	22.00
Weight of Water (gm)	115.52	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	557.78	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**20.7**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	19647.8	Weight of the Dry Specimen (gm)	557.78
Dry Weight - 3/4" Sample (gm)	16276.8	Weight of minus #200 material (gm)	243.03
Wet Weight +3/4" Sample (gm)	385.90	Weight of plus #200 material (gm)	314.75
Dry Weight + 3/4" Sample (gm)	385.90		
Total Dry Weight Sample (gm)	16662.7	**J - Factor (Percent Finer than 3/4")**	**0.9768**

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	194.50		1.2	1.2	98.8	**98.8**
3/4"	19	191.40		1.1	2.3	97.7	**97.7**
1/2"	12.5	0.00		0.0	0.0	100.0	**97.7**
3/8"	9.5	0.00		0.0	0.0	100.0	**97.7**
#4	4.75	0.00		0.0	0.0	100.0	**97.7**
#10	2	29.13		5.2	5.2	94.8	**92.6**
#20	0.85	35.38	(**)	6.3	11.6	88.4	**86.4**
#40	0.425	43.68		7.8	19.4	80.6	**78.7**
#60	0.25	63.69		11.4	30.8	69.2	**67.6**
#140	0.106	114.38		20.5	51.3	48.7	**47.6**
#200	0.075	28.49		5.1	56.4	43.6	**42.6**
Pan	-	243.03		43.6	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/26/2008 Checked By Gem Date 10-6-08

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	6
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-06	Soil Color	**ORANGE**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/26/2008 Checked By GBM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-10-06 J-SIEVEON.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	6
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-06	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	201	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	754.01	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	647.93	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	170.71	Weight of Tare (gm)	22.00
Weight of Water (gm)	106.08	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	477.22	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**22.2**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	16956.6	Weight of the Dry Specimen (gm)	477.22
Dry Weight - 3/4" Sample (gm)	13872.8	Weight of minus #200 material (gm)	233.90
Wet Weight +3/4" Sample (gm)	70.57	Weight of plus #200 material (gm)	243.32
Dry Weight + 3/4" Sample (gm)	70.57		
Total Dry Weight Sample (gm)	13943.4	**J - Factor (Percent Finer than 3/4")**	**0.9949**

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	27.97		0.2	0.2	99.8	**99.8**
3/4"	19	42.60		0.3	0.5	99.5	**99.5**
1/2"	12.5	0.00		0.0	0.0	100.0	**99.5**
3/8"	9.5	0.00		0.0	0.0	100.0	**99.5**
#4	4.75	0.00		0.0	0.0	100.0	**99.5**
#10	2	6.98		1.5	1.5	98.5	**98.0**
#20	0.85	16.87	(**)	3.5	5.0	95.0	**94.5**
#40	0.425	47.39		9.9	14.9	85.1	**84.6**
#60	0.25	51.57		10.8	25.7	74.3	**73.9**
#140	0.106	96.36		20.2	45.9	54.1	**53.8**
#200	0.075	24.15		5.1	51.0	49.0	**48.8**
Pan	-	233.90		49.0	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/26/2008 Checked By Gan Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	7
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-07	Soil Color	**LIGHT BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/26/2008 Checked By GJM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	7
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-07	Soil Color	**LIGHT BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	210	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	885.72	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	772.58	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	172.83	Weight of Tare (gm)	22.00
Weight of Water (gm)	113.14	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	599.75	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**18.9**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	22418.5	Weight of the Dry Specimen (gm)	599.75
Dry Weight - 3/4" Sample (gm)	18860.5	Weight of minus #200 material (gm)	197.64
Wet Weight +3/4" Sample (gm)	711.73	Weight of plus #200 material (gm)	402.11
Dry Weight + 3/4" Sample (gm)	711.73		
Total Dry Weight Sample (gm)	19572.3	**J - Factor (Percent Finer than 3/4")**	**0.9636**

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	318.81	(*)	1.6	1.6	98.4	**98.4**
1 1/2"	37.5	94.91		0.5	2.1	97.9	**97.9**
1"	25	171.66		0.9	3.0	97.0	**97.0**
3/4"	19	126.35		0.6	3.6	96.4	**96.4**
1/2"	12.5	0.00		0.0	0.0	100.0	**96.4**
3/8"	9.5	0.00		0.0	0.0	100.0	**96.4**
#4	4.75	0.00		0.0	0.0	100.0	**96.4**
#10	2	69.43		11.6	11.6	88.4	**85.2**
#20	0.85	79.49	(**)	13.3	24.8	75.2	**72.4**
#40	0.425	65.75		11.0	35.8	64.2	**61.9**
#60	0.25	63.21		10.5	46.3	53.7	**51.7**
#140	0.106	99.34		16.6	62.9	37.1	**35.8**
#200	0.075	24.89		4.2	67.0	33.0	**31.8**
Pan	-	197.64		33.0	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/26/2008 Checked By BEM Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	10
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-10	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/23/2008 Checked By Gan Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-10-10 J-SIEVEON.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	10
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-10	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	397	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	824.82	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	732.57	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	208.49	Weight of Tare (gm)	22.00
Weight of Water (gm)	92.25	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	524.08	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**17.6**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	20218.3	Weight of the Dry Specimen (gm)	524.08
Dry Weight - 3/4" Sample (gm)	17192.1	Weight of minus #200 material (gm)	82.92
Wet Weight +3/4" Sample (gm)	14.20	Weight of plus #200 material (gm)	441.16
Dry Weight + 3/4" Sample (gm)	14.20		
Total Dry Weight Sample (gm)	17206.3	**J - Factor (Percent Finer than 3/4")**	**0.9992**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	14.20		0.1	0.1	99.9	**99.9**
1/2"	12.5	0.00		0.0	0.0	100.0	**99.9**
3/8"	9.5	3.39		0.6	0.6	99.4	**99.3**
#4	4.75	14.65		2.8	3.4	96.6	**96.5**
#10	2	55.91		10.7	14.1	85.9	**85.8**
#20	0.85	93.51	(**)	17.8	32.0	68.0	**68.0**
#40	0.425	53.14		10.1	42.1	57.9	**57.9**
#60	0.25	90.57		17.3	59.4	40.6	**40.6**
#140	0.106	57.10		10.9	70.3	29.7	**29.7**
#200	0.075	72.89		13.9	84.2	15.8	**15.8**
Pan	-	82.92		15.8	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/23/2008 Checked By GEM Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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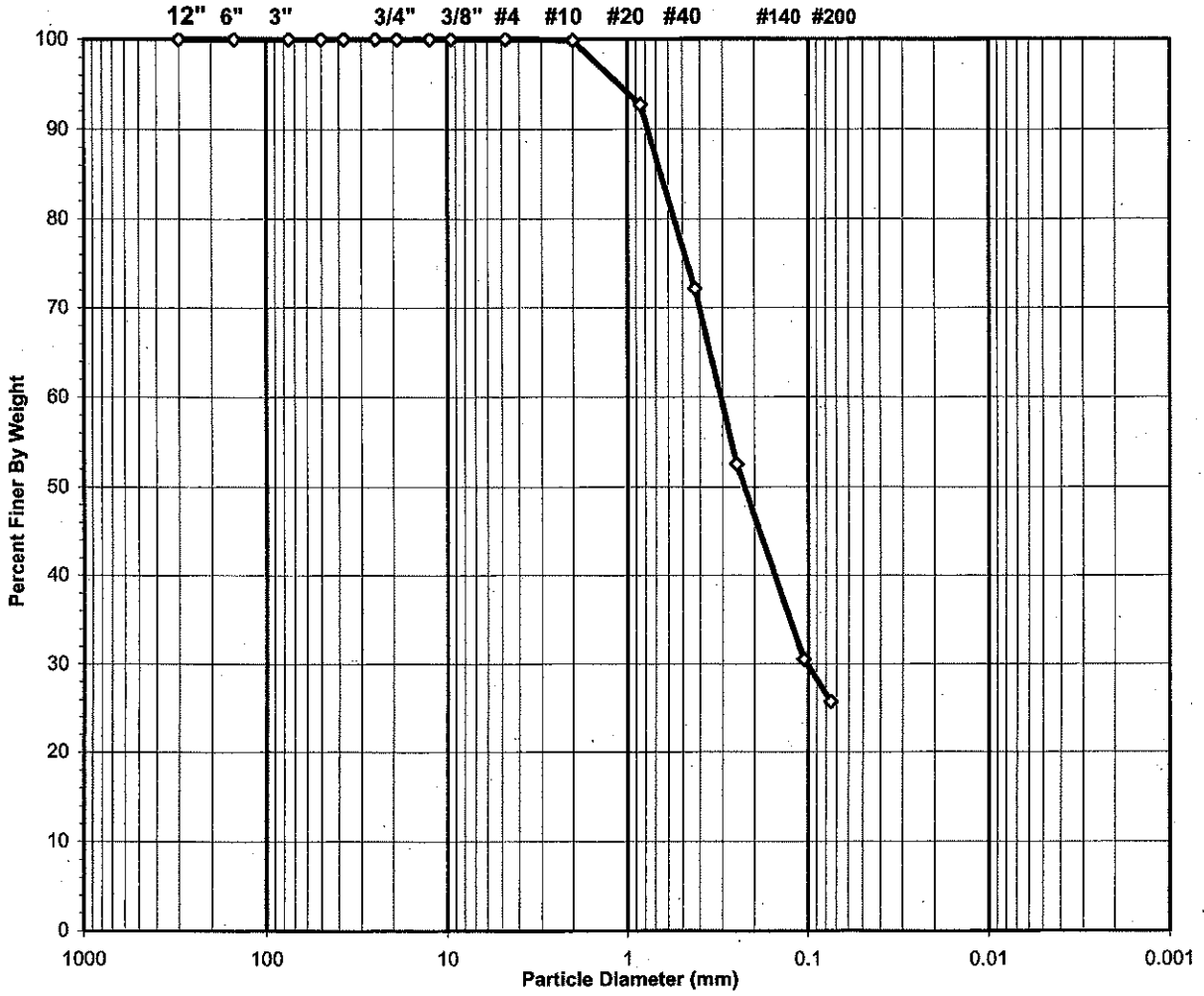
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	11
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-11	Soil Color	**TAN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SM, TESTED (NON PLASTIC FINES)***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/23/2008 Checked By GBM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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Geotechnics
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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	11
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-11	Soil Color	**TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	250	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	734.11	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	639.08	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	169.32	Weight of Tare (gm)	22.00
Weight of Water (gm)	95.03	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	469.76	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**20.2**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	16121.7	Weight of the Dry Specimen (gm)	469.76
Dry Weight - 3/4" Sample (gm)	13409.1	Weight of minus #200 material (gm)	120.80
Wet Weight +3/4" Sample (gm)	0.00	Weight of plus #200 material (gm)	348.96
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	13409.1	**J - Factor (Percent Finer than 3/4")**	**1.0000**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	0.00		0.0	0.0	100.0	**100.0**
1/2"	12.5	0.00		0.0	0.0	100.0	**100.0**
3/8"	9.5	0.00		0.0	0.0	100.0	**100.0**
#4	4.75	0.00		0.0	0.0	100.0	**100.0**
#10	2	0.58		0.1	0.1	99.9	**99.9**
#20	0.85	33.61	(**)	7.2	7.3	92.7	**92.7**
#40	0.425	96.64		20.6	27.9	72.1	**72.1**
#60	0.25	92.26		19.6	47.5	52.5	**52.5**
#140	0.106	103.48		22.0	69.5	30.5	**30.5**
#200	0.075	22.39		4.8	74.3	25.7	**25.7**
Pan	-	120.80		25.7	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/23/2008 Checked By bm Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	12
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-12	Soil Color	**RED BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By JP Date 9/23/08 Checked By MDS Date 10-3-08

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-10-12 J-SIEVEON.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	12
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-12	Soil Color	**RED BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	211	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	828.09	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	680.78	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	171.54	Weight of Tare (gm)	22.00
Weight of Water (gm)	147.31	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	509.24	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**28.9**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	23416.2	Weight of the Dry Specimen (gm)	509.24
Dry Weight - 3/4" Sample (gm)	18162.3	Weight of minus #200 material (gm)	318.15
Wet Weight +3/4" Sample (gm)	774.10	Weight of plus #200 material (gm)	191.09
Dry Weight + 3/4" Sample (gm)	774.10		
Total Dry Weight Sample (gm)	18936.4	**J - Factor (Percent Finer than 3/4")**	**0.9591**

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	102.00		0.5	0.5	99.5	**99.5**
1"	25	443.40		2.3	2.9	97.1	**97.1**
3/4"	19	228.70		1.2	4.1	95.9	**95.9**
1/2"	12.5	8.83		1.7	1.7	98.3	**94.2**
3/8"	9.5	2.98		0.6	2.3	97.7	**93.7**
#4	4.75	4.35		0.9	3.2	96.8	**92.9**
#10	2	8.85		1.7	4.9	95.1	**91.2**
#20	0.85	24.80	(**)	4.9	9.8	90.2	**86.5**
#40	0.425	32.05		6.3	16.1	83.9	**80.5**
#60	0.25	27.80		5.5	21.5	78.5	**75.3**
#140	0.106	58.40		11.5	33.0	67.0	**64.3**
#200	0.075	23.03		4.5	37.5	62.5	**59.9**
Pan	-	318.15		62.5	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/23/08 Checked By [signature] Date 10-3-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	13
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-13	Soil Color	**DARK GRAY**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 9/23/08 Checked By MMF Date 10-3-08

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-10-13 J SIEVEON.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	13
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-13	Soil Color	**DARK GRAY**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	214	Tare No.	D-1
Wgt.Tare + Wet Specimen (gm)	877.95	Wgt.Tare + Wet Specimen (gm)	48.00
Wgt.Tare + Dry Specimen (gm)	757.32	Wgt.Tare + Dry Specimen (gm)	48.00
Weight of Tare (gm)	171.32	Weight of Tare (gm)	22.03
Weight of Water (gm)	120.63	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	586.00	Weight of Dry Soil (gm)	25.97
Moisture Content (%)	**20.6**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	21755.5	Weight of the Dry Specimen (gm)	586.00
Dry Weight - 3/4" Sample (gm)	18041.6	Weight of minus #200 material (gm)	235.92
Wet Weight +3/4" Sample (gm)	1791.20	Weight of plus #200 material (gm)	350.08
Dry Weight + 3/4" Sample (gm)	1791.20		
Total Dry Weight Sample (gm)	19832.8	**J - Factor (Percent Finer than 3/4")**	**0.9097**

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	732.40	(*)	3.7	3.7	96.3	**96.3**
1 1/2"	37.5	199.10		1.0	4.7	95.3	**95.3**
1"	25	583.50		2.9	7.6	92.4	**92.4**
3/4"	19	276.20		1.4	9.0	91.0	**91.0**
1/2"	12.5	0.00		0.0	0.0	100.0	**91.0**
3/8"	9.5	6.78		1.2	1.2	98.8	**89.9**
#4	4.75	12.04		2.1	3.2	96.8	**88.0**
#10	2	15.14		2.6	5.8	94.2	**85.7**
#20	0.85	36.75	(**)	6.3	12.1	87.9	**80.0**
#40	0.425	56.38		9.6	21.7	78.3	**71.2**
#60	0.25	61.28		10.5	32.1	67.9	**61.7**
#140	0.106	119.06		20.3	52.5	47.5	**43.2**
#200	0.075	42.65		7.3	59.7	40.3	**36.6**
Pan	-	235.92		40.3	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/23/08 Checked By MM Date 10-3-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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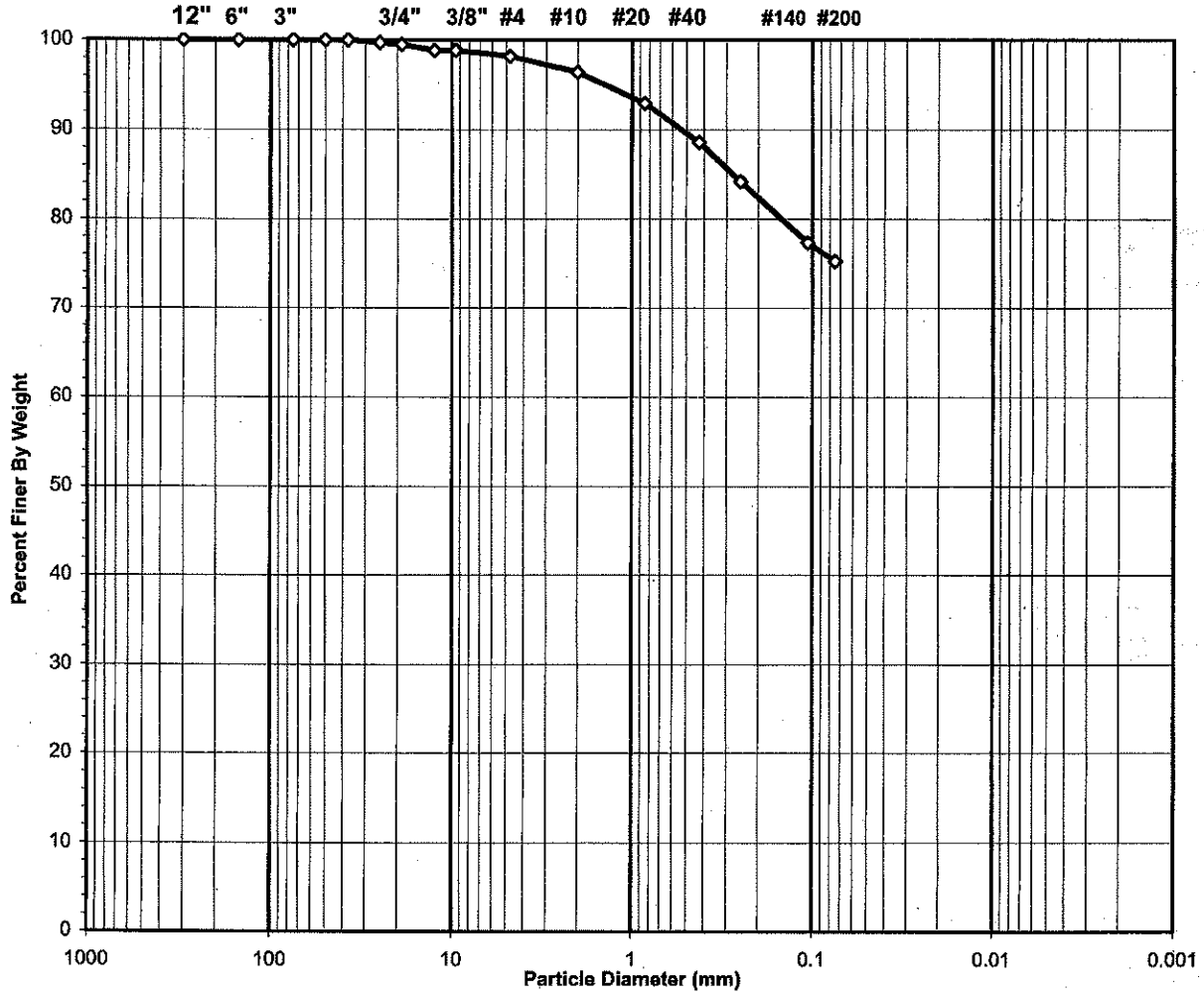
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	15
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-15	Soil Color	**BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***LEAN CLAY WITH SAND***

Tested By JP Date 9/23/2008 Checked By GDM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-10-15 J-SIEVEON.xls]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	15
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-15	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	203	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	854.01	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	731.52	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	171.11	Weight of Tare (gm)	22.00
Weight of Water (gm)	122.49	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	560.41	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**21.9**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	23555.6	Weight of the Dry Specimen (gm)	560.41
Dry Weight - 3/4" Sample (gm)	19330.5	Weight of minus #200 material (gm)	423.78
Wet Weight +3/4" Sample (gm)	98.90	Weight of plus #200 material (gm)	136.63
Dry Weight + 3/4" Sample (gm)	98.90		
Total Dry Weight Sample (gm)	19429.4	**J - Factor (Percent Finer than 3/4")**	**0.9949**

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	59.20		0.3	0.3	99.7	**99.7**
3/4"	19	39.70		0.2	0.5	99.5	**99.5**
1/2"	12.5	3.49		0.6	0.6	99.4	**98.9**
3/8"	9.5	0.00		0.0	0.6	99.4	**98.9**
#4	4.75	3.78		0.7	1.3	98.7	**98.2**
#10	2	10.19		1.8	3.1	96.9	**96.4**
#20	0.85	19.65	(**)	3.5	6.6	93.4	**92.9**
#40	0.425	24.40		4.4	11.0	89.0	**88.6**
#60	0.25	24.78		4.4	15.4	84.6	**84.2**
#140	0.106	38.56		6.9	22.3	77.7	**77.3**
#200	0.075	11.78		2.1	24.4	75.6	**75.2**
Pan	-	423.78		75.6	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/23/2008 Checked By Gem Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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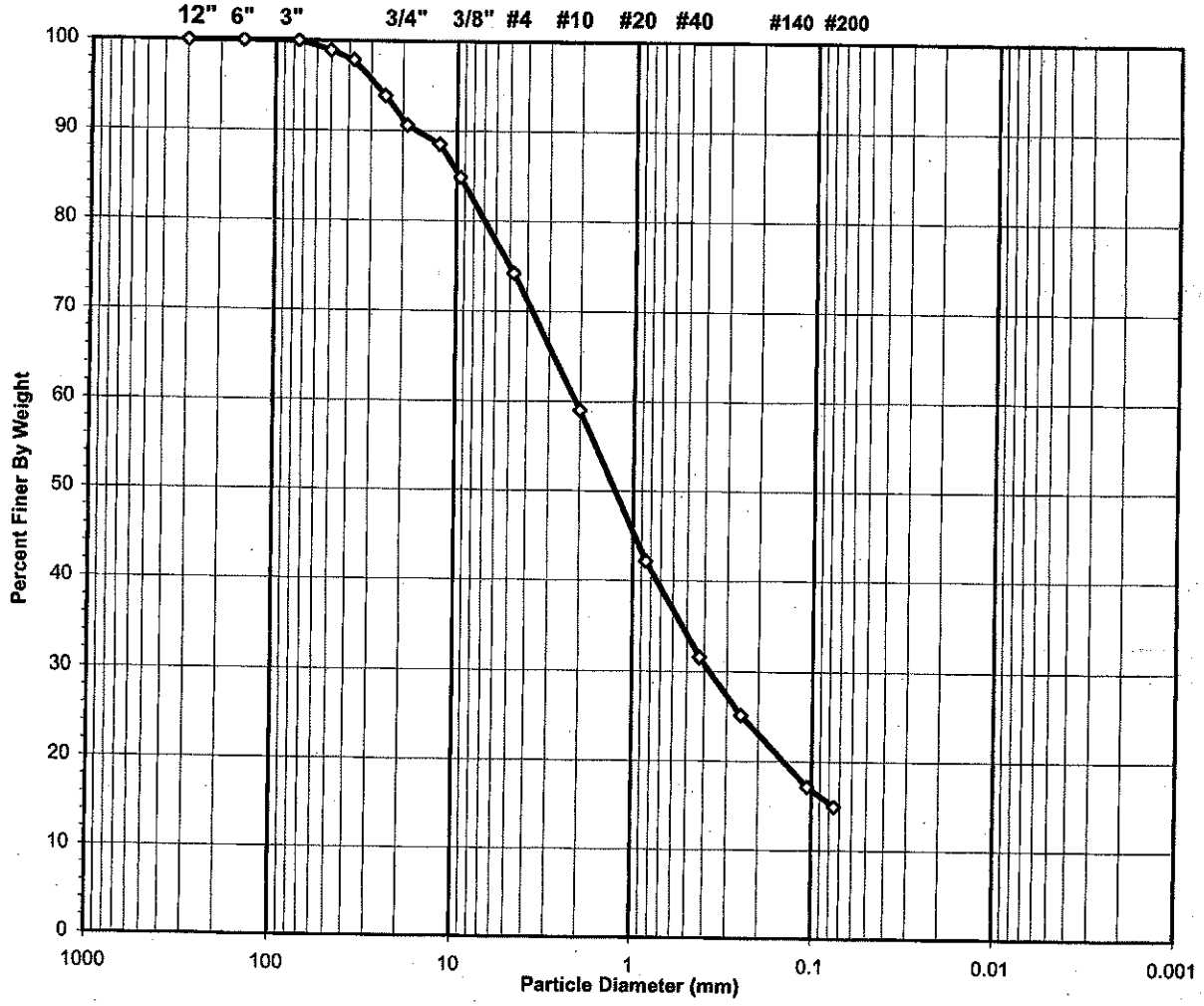
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	16
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-16	Soil Color	**TAN ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED (NON PLASTIC FINES)***

USCS Classification ***SILTY SAND WITH GRAVEL***

Tested By JP Date 9/23/2008 Checked By GBM Date 10-6-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	16
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-16	Soil Color	**TAN ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	201	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	974.35	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	893.38	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	170.71	Weight of Tare (gm)	22.00
Weight of Water (gm)	80.97	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	722.67	Weight of Dry Soil (gm)	22.50
Moisture Content (%)	**11.2**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	23440.3	Weight of the Dry Specimen (gm)	722.67
Dry Weight - 3/4" Sample (gm)	21078.6	Weight of minus #200 material (gm)	118.86
Wet Weight +3/4" Sample (gm)	2194.30	Weight of plus #200 material (gm)	603.81
Dry Weight + 3/4" Sample (gm)	2194.30		
Total Dry Weight Sample (gm)	23272.9	**J - Factor (Percent Finer than 3/4")**	**0.9057**

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	247.40	(*)	1.1	1.1	98.9	**98.9**
1 1/2"	37.5	250.60		1.1	2.1	97.9	**97.9**
1"	25	926.70		4.0	6.1	93.9	**93.9**
3/4"	19	769.60		3.3	9.4	90.6	**90.6**
1/2"	12.5	16.46		2.3	2.3	97.7	**88.5**
3/8"	9.5	29.93		4.1	6.4	93.6	**84.8**
#4	4.75	84.00		11.6	18.0	82.0	**74.2**
#10	2	121.48		16.8	34.9	65.1	**59.0**
#20	0.85	134.35	(**)	18.6	53.4	46.6	**42.2**
#40	0.425	84.84		11.7	65.2	34.8	**31.5**
#60	0.25	51.11		7.1	72.3	27.7	**25.1**
#140	0.106	63.78		8.8	81.1	18.9	**17.1**
#200	0.075	17.86		2.5	83.6	16.4	**14.9**
Pan	-	118.86		16.4	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 9/23/2008 Checked By GEM Date 10-6-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

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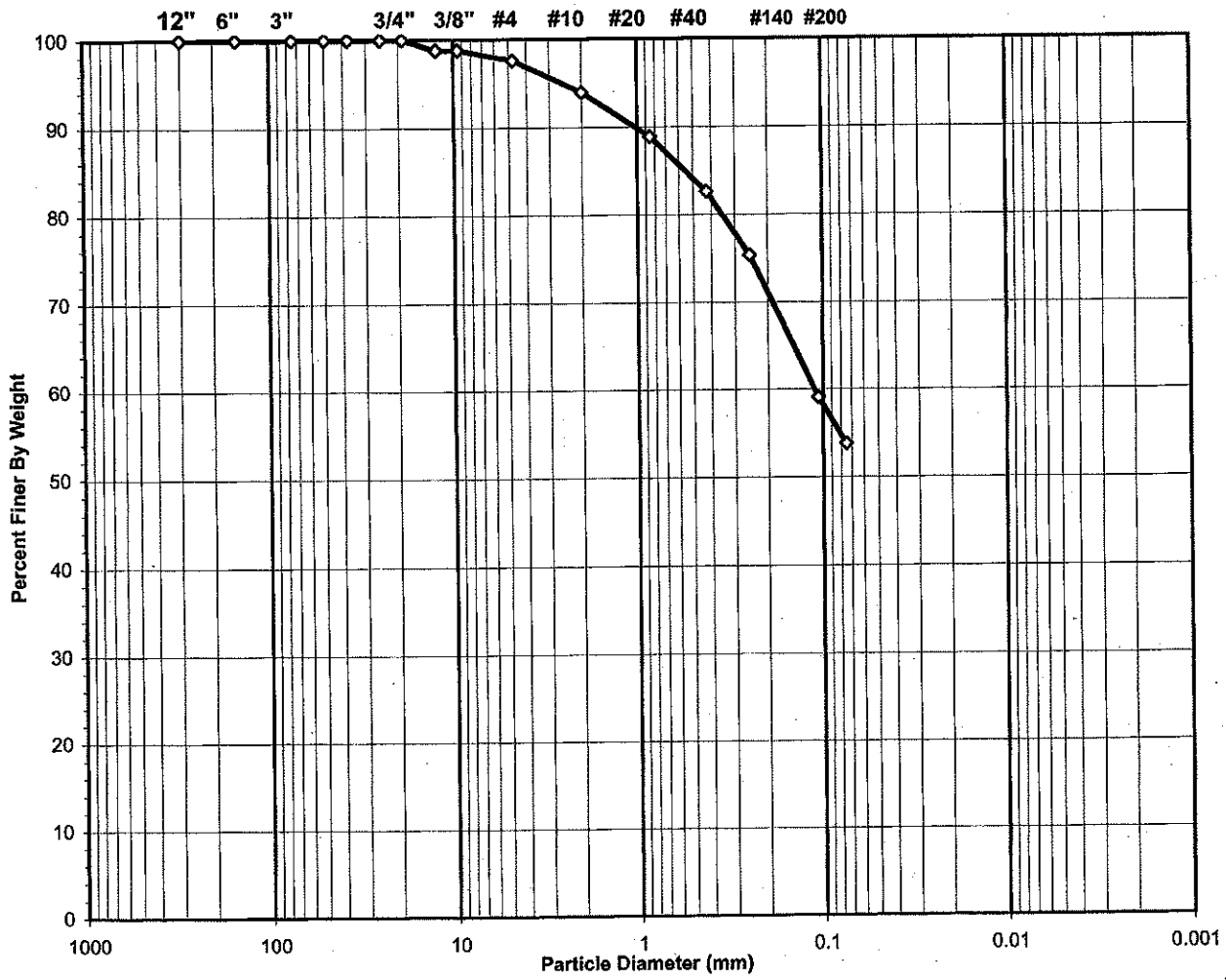
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 92K
Lab ID	2008-606-11-01	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***ML, TESTED***

USCS Classification ***SANDY SILT***

Tested By JP Date 12/1/2008 Checked By TMS Date 12-2-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	N/A
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	P.C.92K
Lab ID	2008-606-11-01	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	208	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	795.04	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	668.75	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	169.79	Weight of Tare (gm)	NA
Weight of Water (gm)	126.29	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	498.96	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.3**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	498.96
Dry Weight - 3/4" Sample (gm)	230.6	Weight of minus #200 material (gm)	268.40
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	230.56
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	5.89	1.2	1.2	98.8	**98.8**
3/8"	9.50	0.00	0.0	1.2	98.8	**98.8**
#4	4.75	6.03	1.2	2.4	97.6	**97.6**
#10	2.00	18.25	3.7	6.0	94.0	**94.0**
#20	0.850	25.32	5.1	11.1	88.9	**88.9**
#40	0.425	31.30	6.3	17.4	82.6	**82.6**
#60	0.250	36.08	7.2	24.6	75.4	**75.4**
#140	0.106	81.27	16.3	40.9	59.1	**59.1**
#200	0.075	26.42	5.3	46.2	53.8	**53.8**
Pan	-	268.40	53.8	100.0	-	-

Tested By JP Date 12/1/2008 Checked By TMS Date 12-2-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-11-01 SIEVON REV 4.XLS]Sheet1

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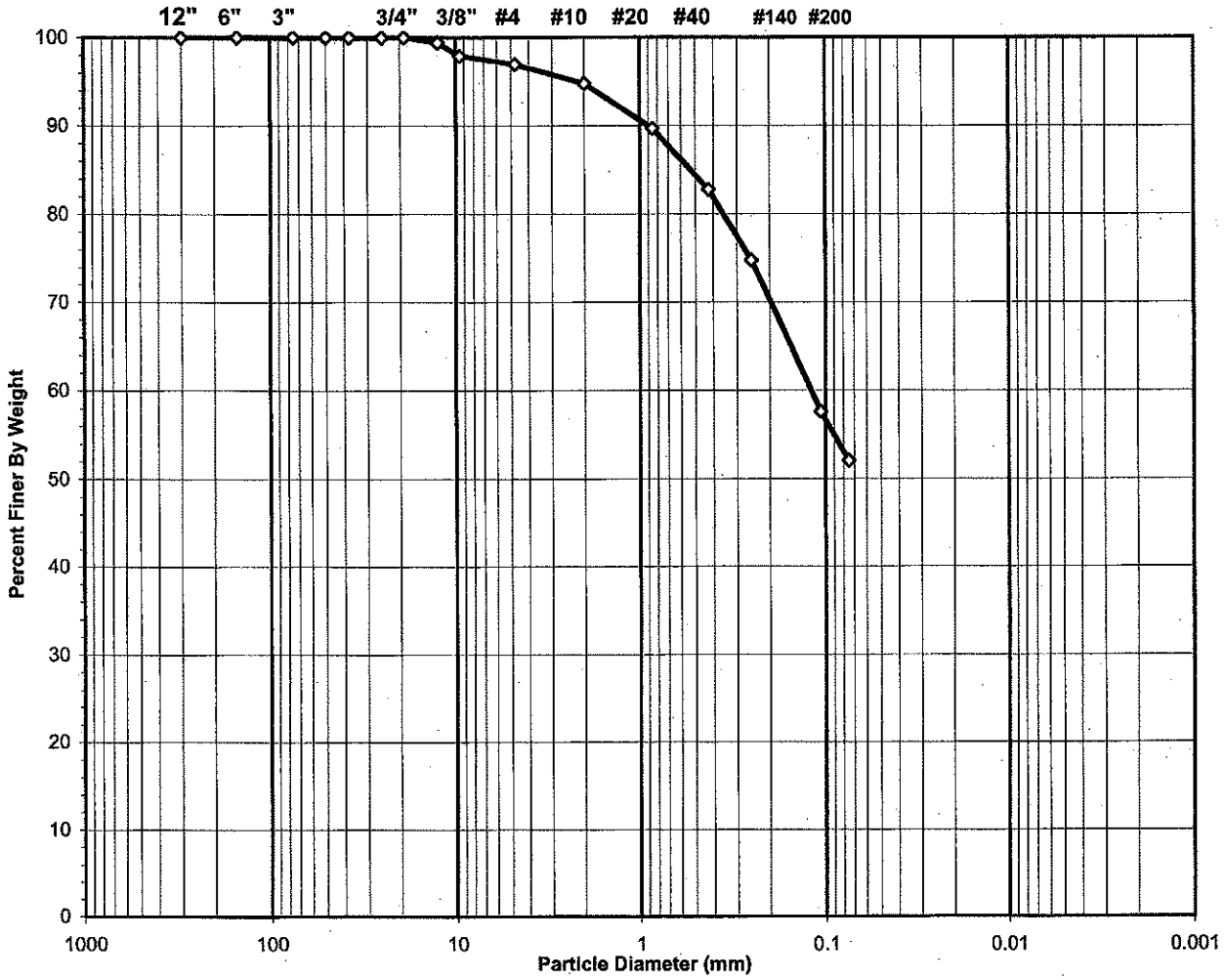
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 96K
Lab ID	2008-606-11-02	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***ML, TESTED***

USCS Classification ***SANDY SILT***

Tested By JP Date 12/1/2008 Checked By TMS Date 12-2-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-11-02 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 96K
Lab ID	2008-606-11-02	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	820	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	930.87	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	793.76	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	208.03	Weight of Tare (gm)	NA
Weight of Water (gm)	137.11	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	585.73	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**23.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	585.73
Dry Weight - 3/4" Sample (gm)	281.0	Weight of minus #200 material (gm)	304.71
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	281.02
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	3.31	0.6	0.6	99.4	**99.4**
3/8"	9.50	8.93	1.5	2.1	97.9	**97.9**
#4	4.75	5.55	0.9	3.0	97.0	**97.0**
#10	2.00	12.74	2.2	5.2	94.8	**94.8**
#20	0.850	30.16	5.1	10.4	89.6	**89.6**
#40	0.425	40.28	6.9	17.2	82.8	**82.8**
#60	0.250	46.70	8.0	25.2	74.8	**74.8**
#140	0.106	100.62	17.2	42.4	57.6	**57.6**
#200	0.075	32.73	5.6	48.0	52.0	**52.0**
Pan	-	304.71	52.0	100.0	-	-

Tested By JP Date 12/1/2008 Checked By TMS Date 12-2-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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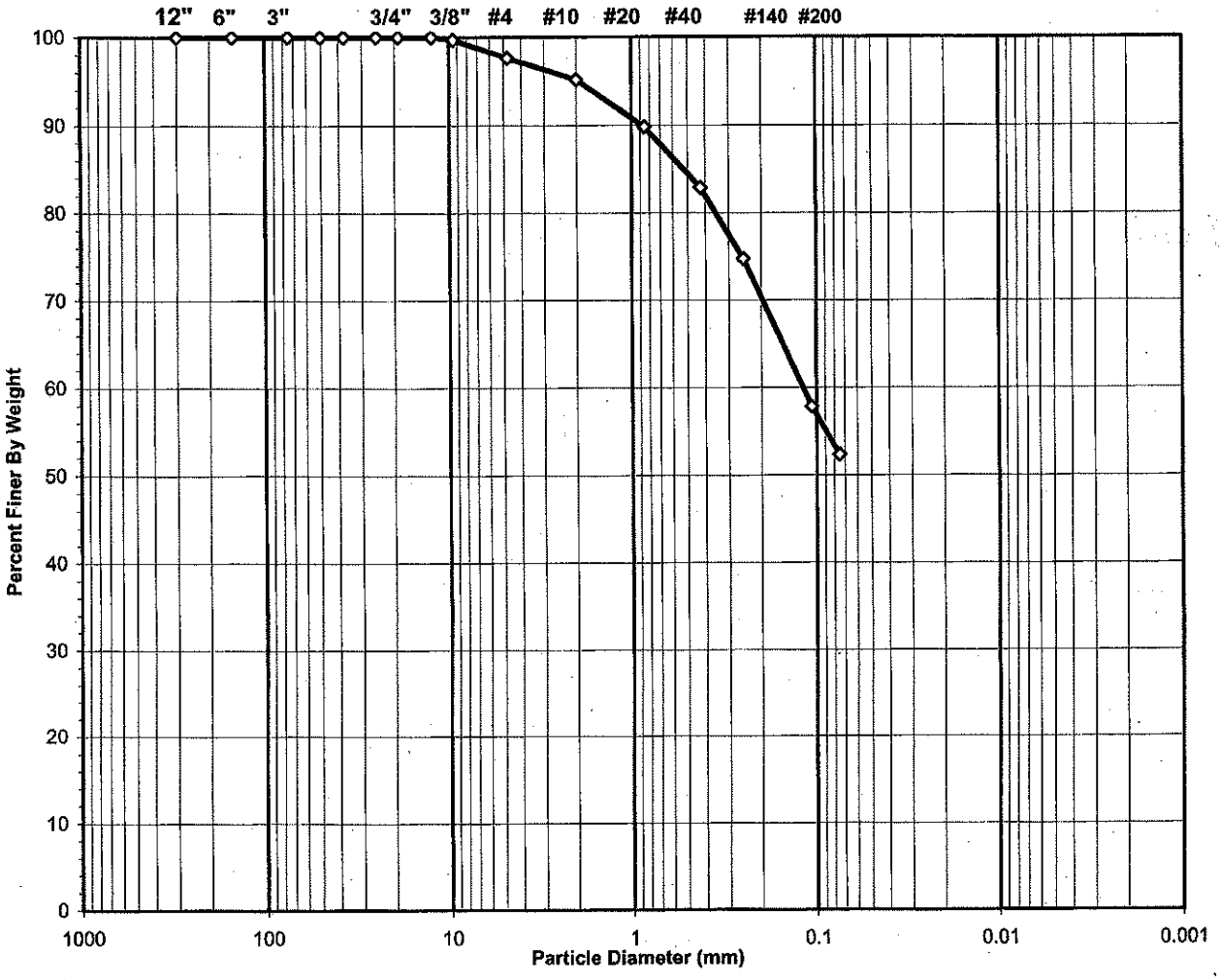
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 100K
Lab ID	2008-606-11-03	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***CL, TESTED***

USCS Classification ***SANDY LEAN CLAY***

Tested By JP Date 12/1/2008 Checked By GBM Date 12-3-08

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 100K
Lab ID	2008-606-11-03	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	210	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	808.34	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	685.02	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	172.85	Weight of Tare (gm)	NA
Weight of Water (gm)	123.32	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	512.17	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**24.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	512.17
Dry Weight - 3/4" Sample (gm)	244.3	Weight of minus #200 material (gm)	267.84
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	244.33
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	1.53	0.3	0.3	99.7	**99.7**
#4	4.75	10.56	2.1	2.4	97.6	**97.6**
#10	2.00	12.67	2.5	4.8	95.2	**95.2**
#20	0.850	27.36	5.3	10.2	89.8	**89.8**
#40	0.425	35.73	7.0	17.2	82.8	**82.8**
#60	0.250	41.52	8.1	25.3	74.7	**74.7**
#140	0.106	86.71	16.9	42.2	57.8	**57.8**
#200	0.075	28.25	5.5	47.7	52.3	**52.3**
Pan	-	267.84	52.3	100.0	-	-

Tested By JP Date 12/1/2008 Checked By GBM Date 12-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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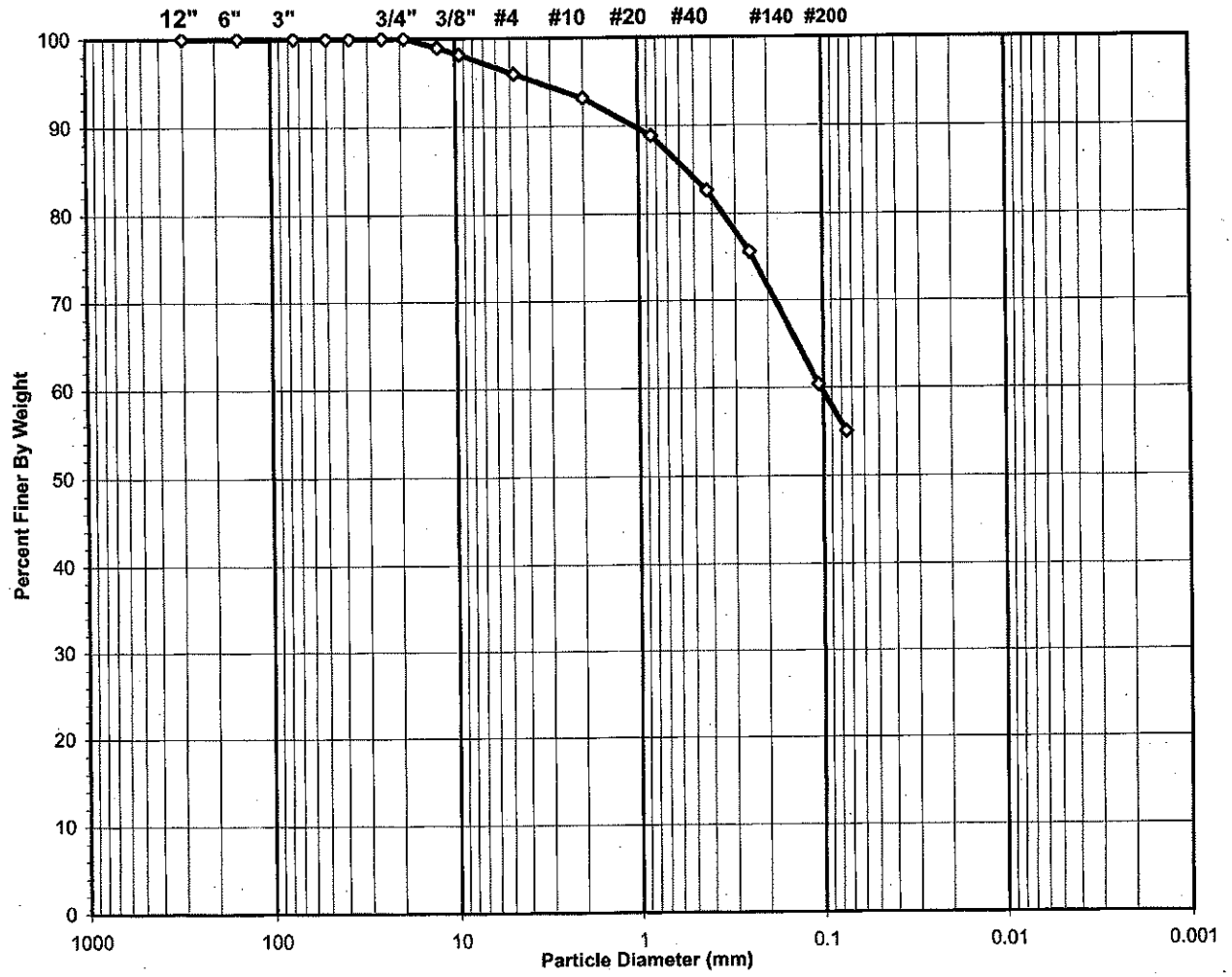
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C.104K
Lab ID	2008-606-11-04	Soil Color	**GRAY/BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***MH, TESTED***

USCS Classification ***SANDY ELASTIC SILT***

Tested By JP Date 12/1/2008 Checked By TMS Date 12-2-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C.104K
Lab ID	2008-606-11-04	Soil Color	**GRAY/BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	P-12	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	971.36	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	801.06	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	196.62	Weight of Tare (gm)	NA
Weight of Water (gm)	170.30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	604.44	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**28.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	604.44
Dry Weight - 3/4" Sample (gm)	271.5	Weight of minus #200 material (gm)	332.93
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	271.51
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	6.14	1.0	1.0	99.0	**99.0**
3/8"	9.50	4.90	0.8	1.8	98.2	**98.2**
#4	4.75	13.25	2.2	4.0	96.0	**96.0**
#10	2.00	16.87	2.8	6.8	93.2	**93.2**
#20	0.850	26.00	4.3	11.1	88.9	**88.9**
#40	0.425	38.09	6.3	17.4	82.6	**82.6**
#60	0.250	41.97	6.9	24.4	75.6	**75.6**
#140	0.106	92.32	15.3	39.6	60.4	**60.4**
#200	0.075	31.97	5.3	44.9	55.1	**55.1**
Pan	-	332.93	55.1	100.0	-	-

Tested By JP Date 12/1/2008 Checked By TMS Date 12-2-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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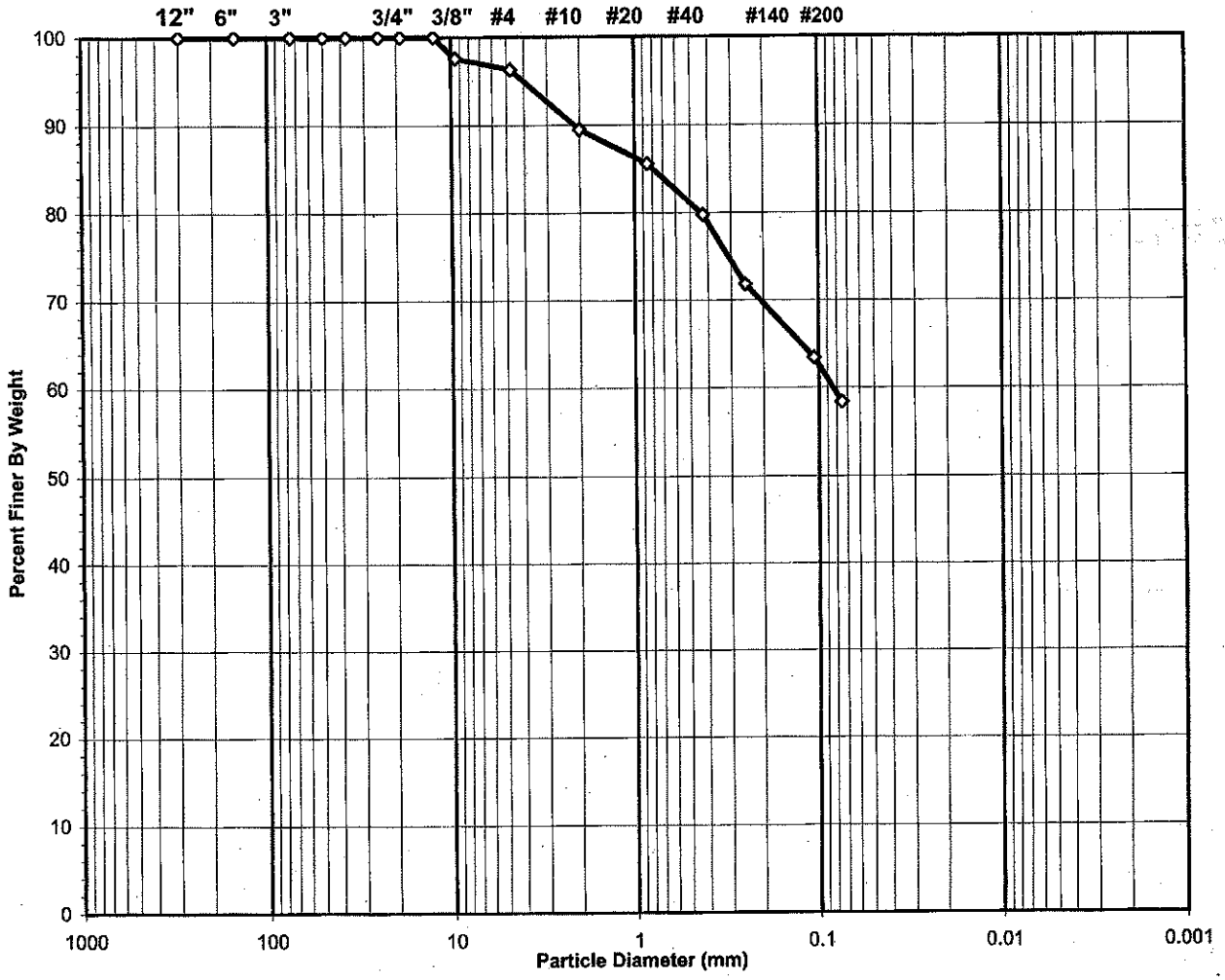
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 108K
Lab ID	2008-606-11-05	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***MH, TESTED***

USCS Classification ***SANDY ELASTIC SILT***

Tested By JP Date 12/2/2008 Checked By TMS Date 12-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 108K
Lab ID	2008-606-11-05	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	203	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	880.54	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	761.69	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.11	Weight of Tare (gm)	NA
Weight of Water (gm)	118.85	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	590.58	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**20.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	590.58
Dry Weight - 3/4" Sample (gm)	246.0	Weight of minus #200 material (gm)	344.55
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	246.03
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	14.27	2.4	2.4	97.6	**97.6**
#4	4.75	7.49	1.3	3.7	96.3	**96.3**
#10	2.00	40.42	6.8	10.5	89.5	**89.5**
#20	0.850	23.00	3.9	14.4	85.6	**85.6**
#40	0.425	34.54	5.8	20.3	79.7	**79.7**
#60	0.250	46.54	7.9	28.2	71.8	**71.8**
#140	0.106	49.77	8.4	36.6	63.4	**63.4**
#200	0.075	30.00	5.1	41.7	58.3	**58.3**
Pan	-	344.55	58.3	100.0	-	-

Tested By JP Date 12/2/2008 Checked By TMS Date 12-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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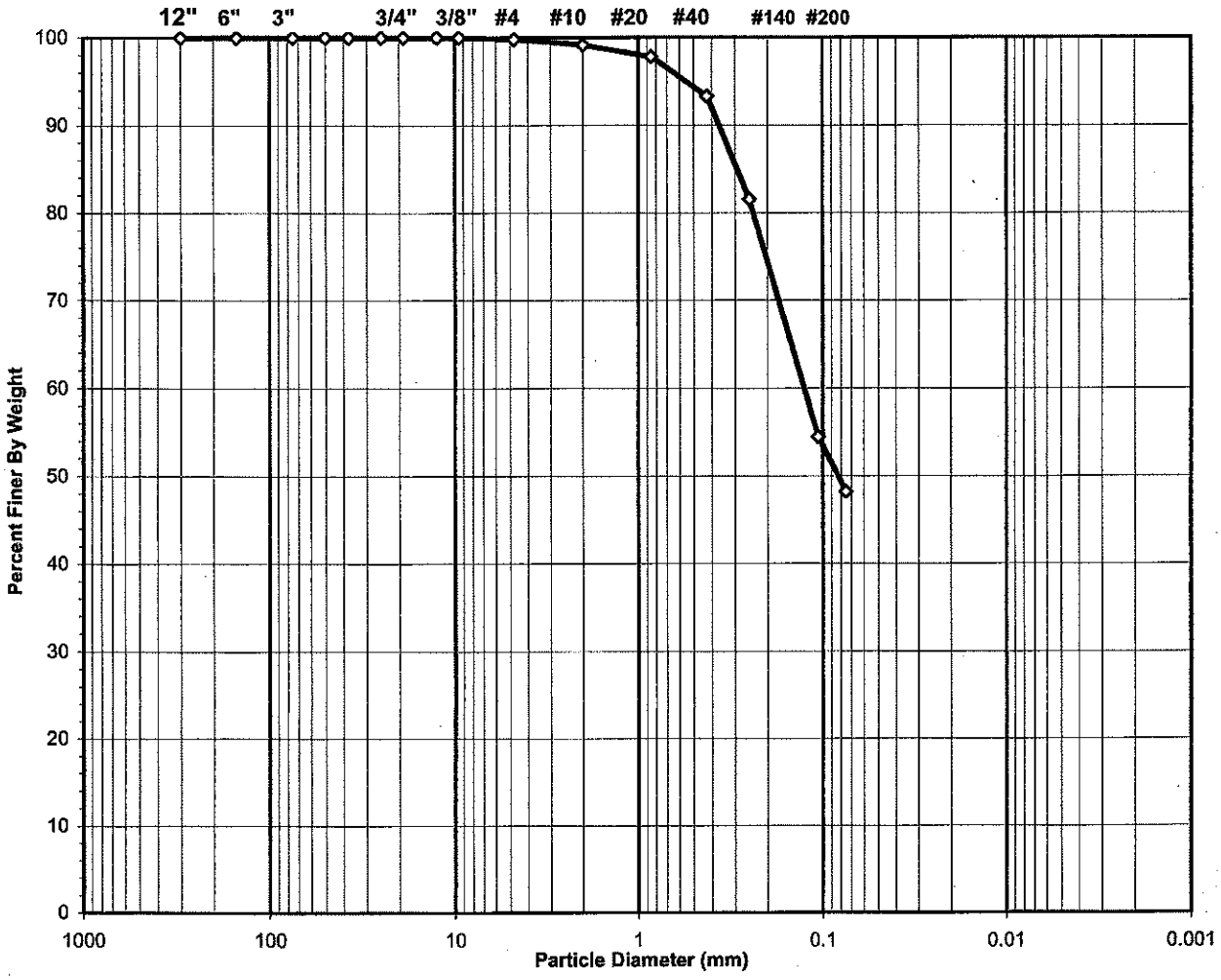
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 112K
Lab ID	2009-633-01-06	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 112K
Lab ID	2009-633-01-06	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	397	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	709.96	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	607.65	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	208.45	Weight of Tare (gm)	NA
Weight of Water (gm)	102.31	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	399.20	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	399.20
Dry Weight - 3/4" Sample (gm)	206.9	Weight of minus #200 material (gm)	192.33
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	206.87
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	0.82	0.2	0.2	99.8	**99.8**
#10	2.00	2.52	0.6	0.8	99.2	**99.2**
#20	0.850	5.43	1.4	2.2	97.8	**97.8**
#40	0.425	17.89	4.5	6.7	93.3	**93.3**
#60	0.250	46.98	11.8	18.4	81.6	**81.6**
#140	0.106	108.23	27.1	45.6	54.4	**54.4**
#200	0.075	25.00	6.3	51.8	48.2	**48.2**
Pan	-	192.33	48.2	100.0	-	-

Tested By JP Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

\\Server\c\2009 PROJECTS\2009-633 THALLE\[2008-633-01-06 SIEVON REV 4.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 116K
Lab ID	2009-633-01-07	Soil Color	**BROWN**

	SIEVE ANALYSIS		HYDROMETER
USCS	gravel	sand	silt and clay

USCS Symbol ***ML, TESTED***

USCS Classification ***SANDY SILT***

Tested By SD Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 116K
Lab ID	2009-633-01-07	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	837	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	760.25	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	683.14	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	260.66	Weight of Tare (gm)	NA
Weight of Water (gm)	77.11	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	422.48	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**18.3**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	422.48
Dry Weight - 3/4" Sample (gm)	207.2	Weight of minus #200 material (gm)	215.24
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	207.24
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	6.15	1.5	1.5	98.5	**98.5**
3/8"	9.50	0.00	0.0	1.5	98.5	**98.5**
#4	4.75	10.42	2.5	3.9	96.1	**96.1**
#10	2.00	13.02	3.1	7.0	93.0	**93.0**
#20	0.850	17.62	4.2	11.2	88.8	**88.8**
#40	0.425	27.92	6.6	17.8	82.2	**82.2**
#60	0.250	37.81	8.9	26.7	73.3	**73.3**
#140	0.106	73.80	17.5	44.2	55.8	**55.8**
#200	0.075	20.50	4.9	49.1	50.9	**50.9**
Pan	-	215.24	50.9	100.0	-	-

Tested By SD Date 2/27/2009 Checked By GEM Date 3409

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 120K
Lab ID	2009-633-01-08	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By SD Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 120K
Lab ID	2009-633-01-08	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	215	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	735.86	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	609.53	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	172.39	Weight of Tare (gm)	NA
Weight of Water (gm)	126.33	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	437.14	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**28.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	437.14
Dry Weight - 3/4" Sample (gm)	241.2	Weight of minus #200 material (gm)	195.98
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	241.16
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	0.46	0.1	0.1	99.9	**99.9**
#10	2.00	1.28	0.3	0.4	99.6	**99.6**
#20	0.850	9.06	2.1	2.5	97.5	**97.5**
#40	0.425	27.49	6.3	8.8	91.2	**91.2**
#60	0.250	61.24	14.0	22.8	77.2	**77.2**
#140	0.106	118.30	27.1	49.8	50.2	**50.2**
#200	0.075	23.33	5.3	55.2	44.8	**44.8**
Pan	-	195.98	44.8	100.0	-	-

Tested By SD Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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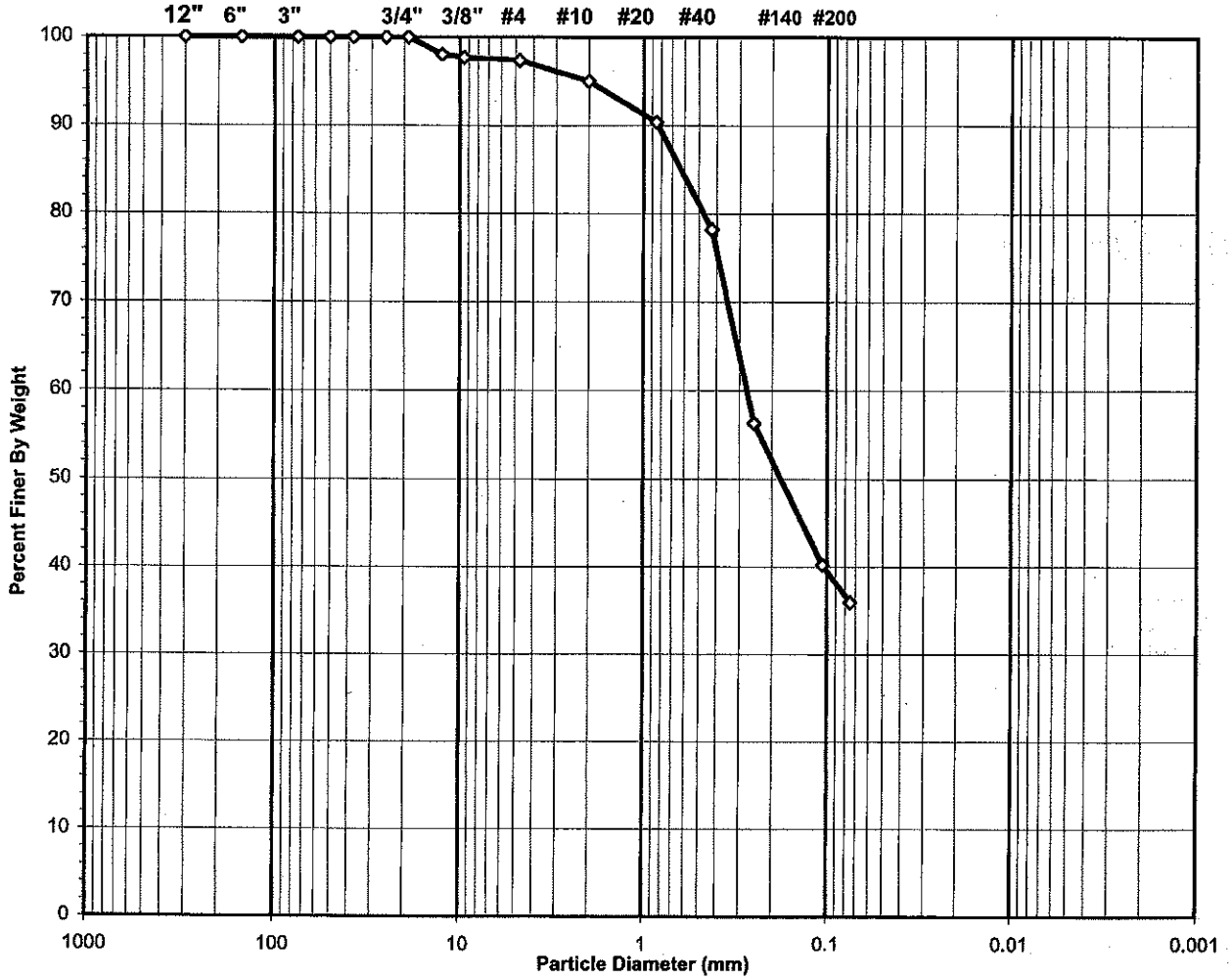
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 124K
Lab ID	2009-633-01-09	Soil Color	**BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 3/2/2009 Checked By GEM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-09 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 124K
Lab ID	2009-633-01-09	Soil Color	**BROWN**

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)	815.99	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	724.48	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	262.61	Weight of Tare (gm)	NA
Weight of Water (gm)	91.51	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	461.87	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	461.87
Dry Weight - 3/4" Sample (gm)	296.0	Weight of minus #200 material (gm)	165.88
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	295.99
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	8.94	1.9	1.9	98.1	**98.1**
3/8"	9.50	1.58	0.3	2.3	97.7	**97.7**
#4	4.75	1.54	0.3	2.6	97.4	**97.4**
#10	2.00	10.87	2.4	5.0	95.0	**95.0**
#20	0.850	21.56	4.7	9.6	90.4	**90.4**
#40	0.425	56.29	12.2	21.8	78.2	**78.2**
#60	0.250	101.04	21.9	43.7	56.3	**56.3**
#140	0.106	74.40	16.1	59.8	40.2	**40.2**
#200	0.075	19.77	4.3	64.1	35.9	**35.9**
Pan	-	165.88	35.9	100.0	-	-

Tested By JP Date 3/2/2009 Checked By GEM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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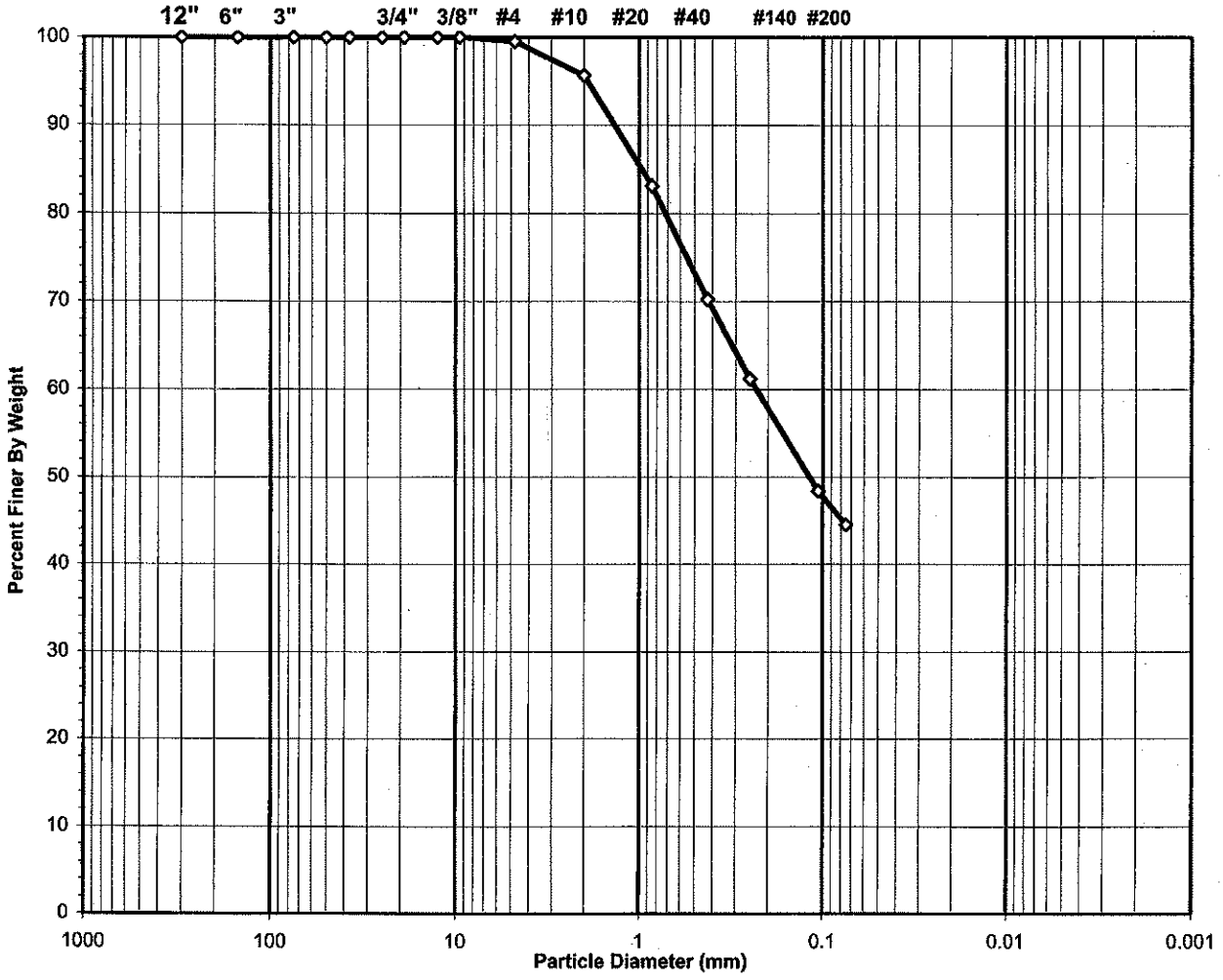
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 128K
Lab ID	2009-633-01-10	Soil Color	**BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 3/2/2009 Checked By GBM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-10 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 128K
Lab ID	2009-633-01-10	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	843	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	667.39	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	601.66	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	262.22	Weight of Tare (gm)	NA
Weight of Water (gm)	65.73	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	339.44	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	339.44
Dry Weight - 3/4" Sample (gm)	188.4	Weight of minus #200 material (gm)	151.06
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	188.38
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	1.56	0.5	0.5	99.5	**99.5**
#10	2.00	13.27	3.9	4.4	95.6	**95.6**
#20	0.850	42.61	12.6	16.9	83.1	**83.1**
#40	0.425	43.75	12.9	29.8	70.2	**70.2**
#60	0.250	30.58	9.0	38.8	61.2	**61.2**
#140	0.106	43.45	12.8	51.6	48.4	**48.4**
#200	0.075	13.16	3.9	55.5	44.5	**44.5**
Pan	-	151.06	44.5	100.0	-	-

Tested By JP Date 3/2/2009 Checked By GEM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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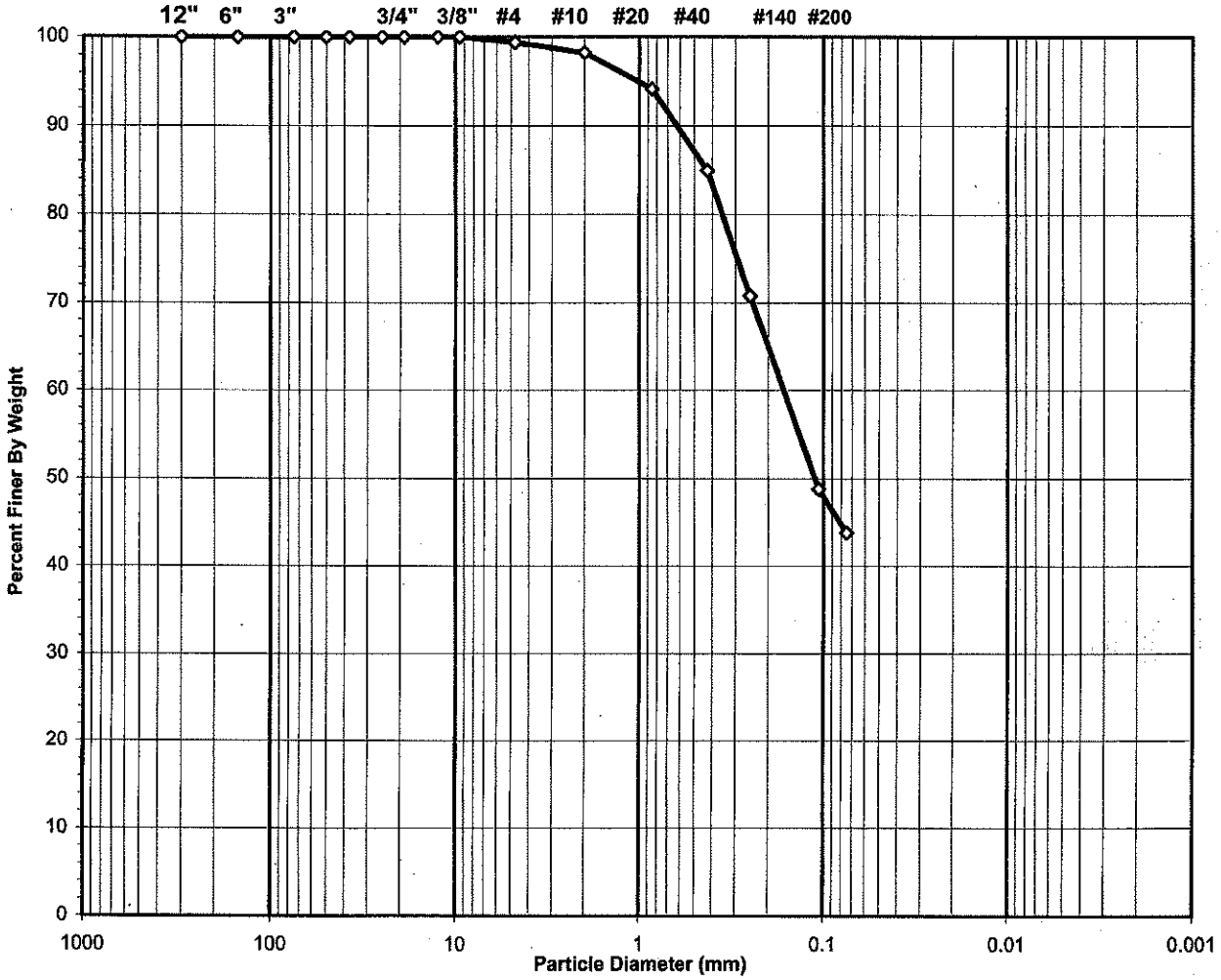
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 132K
Lab ID	2009-633-01-11	Soil Color	**ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 3/2/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 132K
Lab ID	2009-633-01-11	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	210	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	650.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	553.10	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	172.85	Weight of Tare (gm)	NA
Weight of Water (gm)	97.30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	380.25	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	380.25
Dry Weight - 3/4" Sample (gm)	213.8	Weight of minus #200 material (gm)	166.49
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	213.76
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	2.33	0.6	0.6	99.4	**99.4**
#10	2.00	4.32	1.1	1.7	98.3	**98.3**
#20	0.850	15.63	4.1	5.9	94.1	**94.1**
#40	0.425	35.01	9.2	15.1	84.9	**84.9**
#60	0.250	53.90	14.2	29.2	70.8	**70.8**
#140	0.106	83.61	22.0	51.2	48.8	**48.8**
#200	0.075	18.96	5.0	56.2	43.8	**43.8**
Pan	-	166.49	43.8	100.0	-	-

Tested By JP Date 3/2/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
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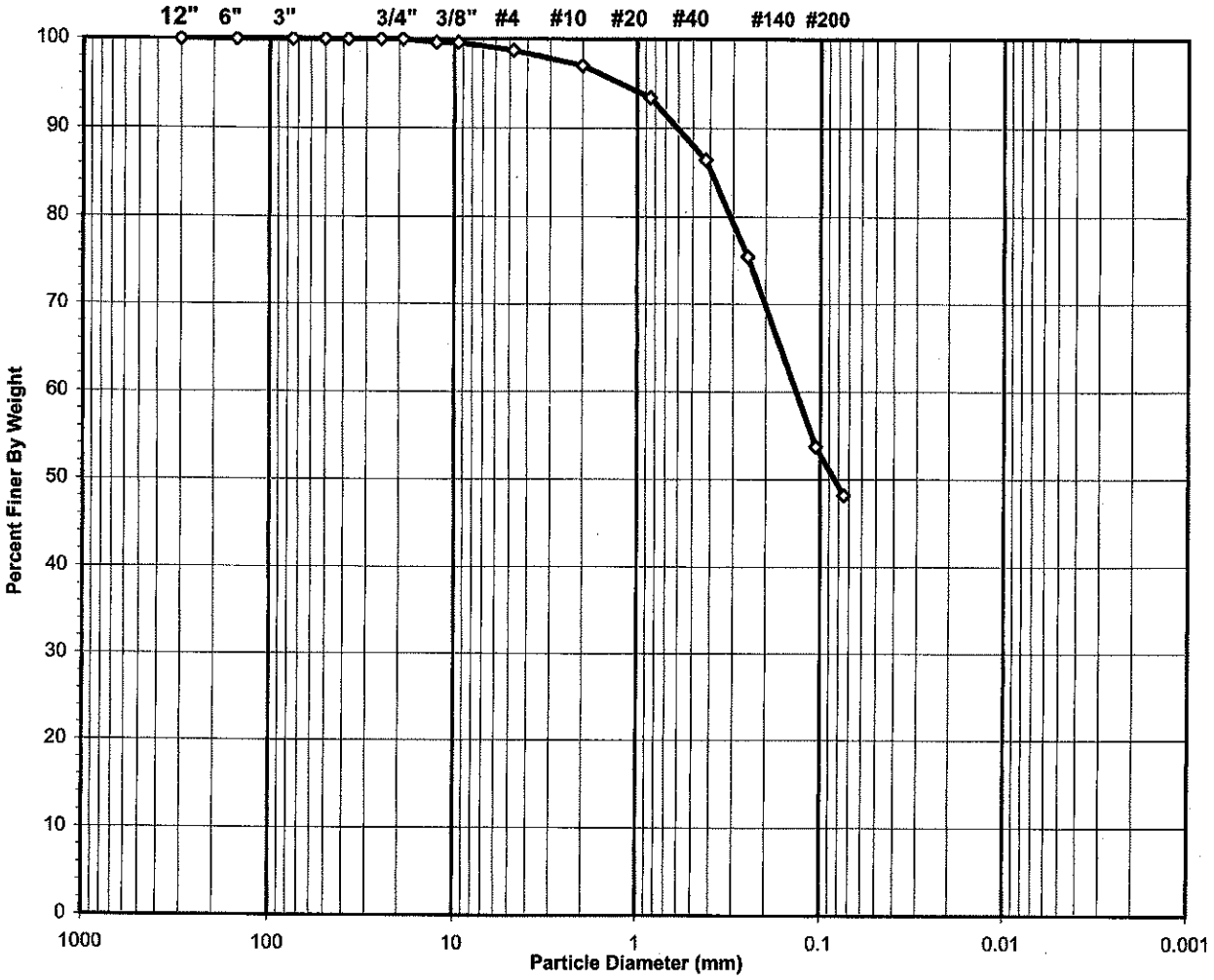
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 136K
Lab ID	2009-633-01-12	Soil Color	**BROWN**

USCS	*SIEVE ANALYSIS*		*HYDROMETER*
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 3/2/2009 Checked By GEM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-12 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 136K
Lab ID	2009-633-01-12	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	213	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	902.26	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	778.40	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	173.16	Weight of Tare (gm)	NA
Weight of Water (gm)	123.86	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	605.24	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**20.5**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	605.24
Dry Weight - 3/4" Sample (gm)	313.7	Weight of minus #200 material (gm)	291.59
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	313.65
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	2.39	0.4	0.4	99.6	**99.6**
3/8"	9.50	0.00	0.0	0.4	99.6	**99.6**
#4	4.75	5.39	0.9	1.3	98.7	**98.7**
#10	2.00	10.48	1.7	3.0	97.0	**97.0**
#20	0.850	21.88	3.6	6.6	93.4	**93.4**
#40	0.425	42.15	7.0	13.6	86.4	**86.4**
#60	0.250	66.22	10.9	24.5	75.5	**75.5**
#140	0.106	131.54	21.7	46.3	53.7	**53.7**
#200	0.075	33.60	5.6	51.8	48.2	**48.2**
Pan	-	291.59	48.2	100.0	-	-

Tested By JP Date 3/2/2009 Checked By GEM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

\\Server\c\2009 PROJECTS\2009-633 THALLE\2009-633-01-12 SIEVON REV 4.XLS]Sheet1

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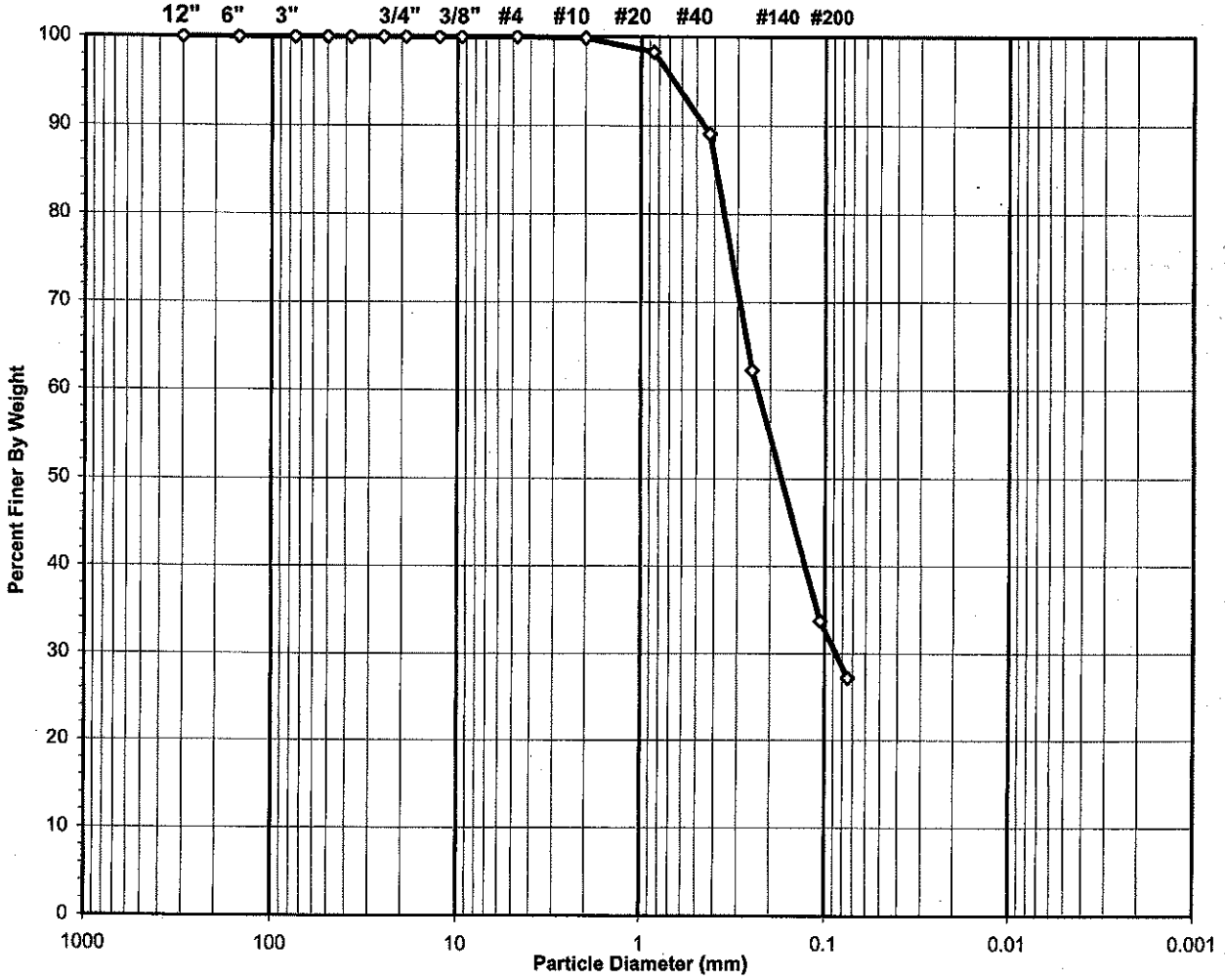
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 140K
Lab ID	2009-633-01-13	Soil Color	**LIGHT BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By JP Date 3/2/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\2009-633-01-13 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 140K
Lab ID	2009-633-01-13	Soil Color	**LIGHT BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	214	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	649.41	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	554.15	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.21	Weight of Tare (gm)	NA
Weight of Water (gm)	95.26	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	382.94	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**24.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	382.94
Dry Weight - 3/4" Sample (gm)	278.8	Weight of minus #200 material (gm)	104.16
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	278.78
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	0.00	0.0	0.0	100.0	**100.0**
#10	2.00	0.47	0.1	0.1	99.9	**99.9**
#20	0.850	6.02	1.6	1.7	98.3	**98.3**
#40	0.425	35.28	9.2	10.9	89.1	**89.1**
#60	0.250	102.79	26.8	37.8	62.2	**62.2**
#140	0.106	109.27	28.5	66.3	33.7	**33.7**
#200	0.075	24.95	6.5	72.8	27.2	**27.2**
Pan	-	104.16	27.2	100.0	-	-

Tested By JP Date 3/2/2009 Checked By GEM Date 3-4-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 144K
Lab ID	2009-633-01-14	Soil Color	**BROWN**

USCS	*SIEVE ANALYSIS*		*HYDROMETER*
	gravel	sand	silt and clay

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By SD Date 3/2/2009 Checked By Gen Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-14 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 144K
Lab ID	2009-633-01-14	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	G-15	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	1083.49	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	962.66	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	151.29	Weight of Tare (gm)	NA
Weight of Water (gm)	120.83	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	811.37	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	811.37
Dry Weight - 3/4" Sample (gm)	529.4	Weight of minus #200 material (gm)	281.99
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	529.38
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	37.47	4.6	4.6	95.4	**95.4**
3/8"	9.50	10.81	1.3	6.0	94.0	**94.0**
#4	4.75	49.17	6.1	12.0	88.0	**88.0**
#10	2.00	74.25	9.2	21.2	78.8	**78.8**
#20	0.850	56.43	7.0	28.1	71.9	**71.9**
#40	0.425	50.57	6.2	34.3	65.7	**65.7**
#60	0.250	56.32	6.9	41.3	58.7	**58.7**
#140	0.106	144.27	17.8	59.1	40.9	**40.9**
#200	0.075	50.09	6.2	65.2	34.8	**34.8**
Pan	-	281.99	34.8	100.0	-	-

Tested By SD Date 3/2/2009 Checked By GBM Date 3-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 \\Server\c\2009 PROJECTS\2009-633 THALLE\2009-633-01-14 SIEVON REV 4.XLS]Sheet1

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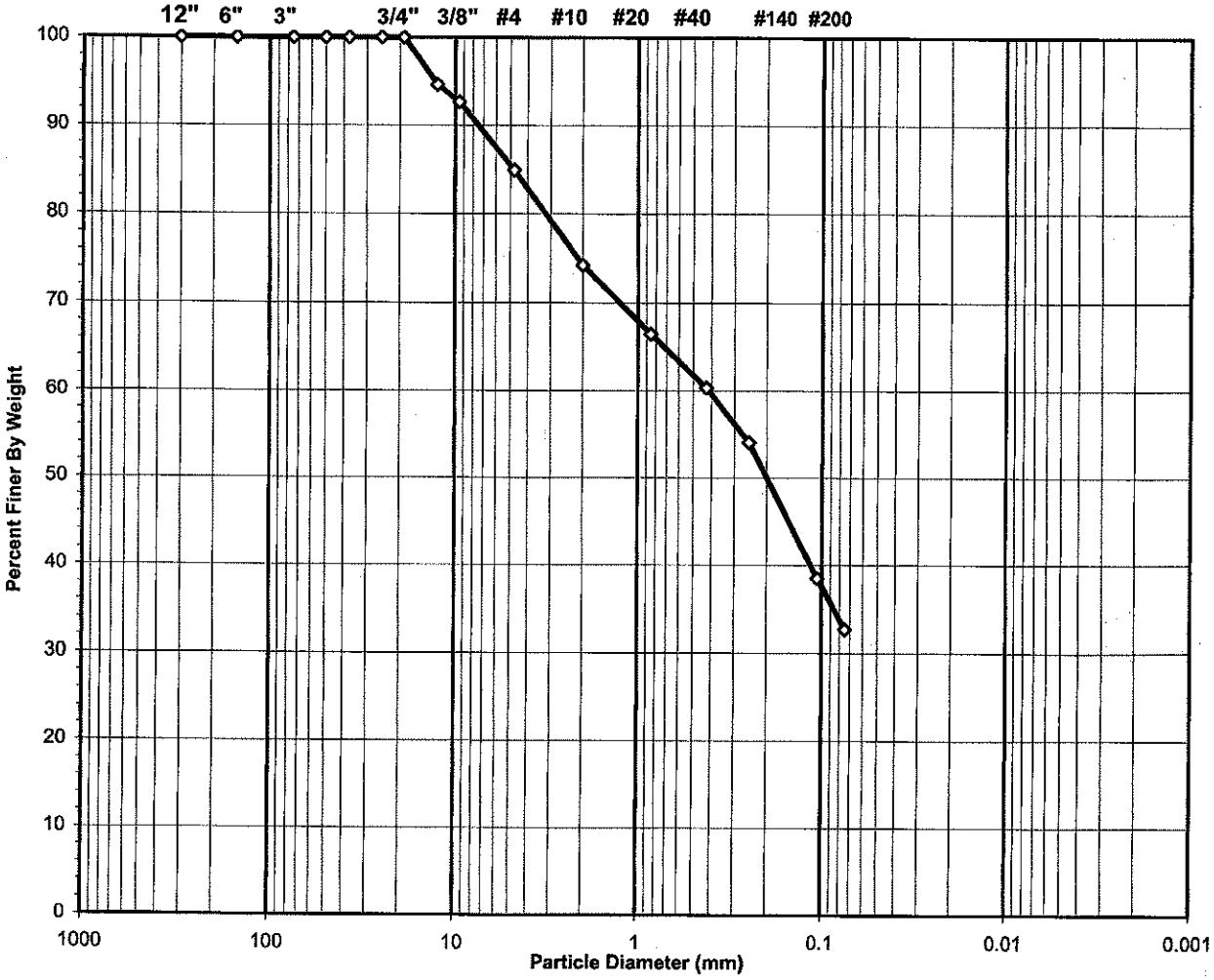
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 148K
Lab ID	2009-633-01-15	Soil Color	**BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND WITH GRAVEL***

Tested By SD Date 3/2/2009 Checked By CEM Date 3-9-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-15 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF. CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 148K
Lab ID	2009-633-01-15	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	820	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	755.20	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	687.19	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	209.30	Weight of Tare (gm)	NA
Weight of Water (gm)	68.01	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	477.89	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)	477.89
Dry Weight - 3/4" Sample (gm)	321.7	Weight of minus #200 material (gm)	156.18
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	321.71
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	25.66	5.4	5.4	94.6	**94.6**
3/8"	9.50	9.34	2.0	7.3	92.7	**92.7**
#4	4.75	37.35	7.8	15.1	84.9	**84.9**
#10	2.00	50.77	10.6	25.8	74.2	**74.2**
#20	0.850	37.26	7.8	33.6	66.4	**66.4**
#40	0.425	29.24	6.1	39.7	60.3	**60.3**
#60	0.250	29.98	6.3	46.0	54.0	**54.0**
#140	0.106	74.38	15.6	61.5	38.5	**38.5**
#200	0.075	27.73	5.8	67.3	32.7	**32.7**
Pan	-	156.18	32.7	100.0	-	-

Tested By SD Date 3/2/2009 Checked By GEM Date 3-9-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC4K
Lab ID	2008-606-04-03	Soil Description	**DARK BROWN LEAN CLAY**

(Minus No. 40 sieve material, Airdried)

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.

Liquid Limit Test	**1**	**2**	**3**
Tare Number	A-B	A-N	A-K
Wt. of Tare & WS (gm)	26.53	28.62	27.60
Wt. of Tare & DS (gm)	23.69	25.25	24.61
Wt. of Tare (gm)	15.59	15.45	15.56
Wt. of Water (gm)	2.8	3.4	3.0
Wt. of DS (gm)	8.1	9.8	9.1
Moisture Content (%)	**35.1**	**34.4**	**33.0**
Number of Blows	**17**	**25**	**33**

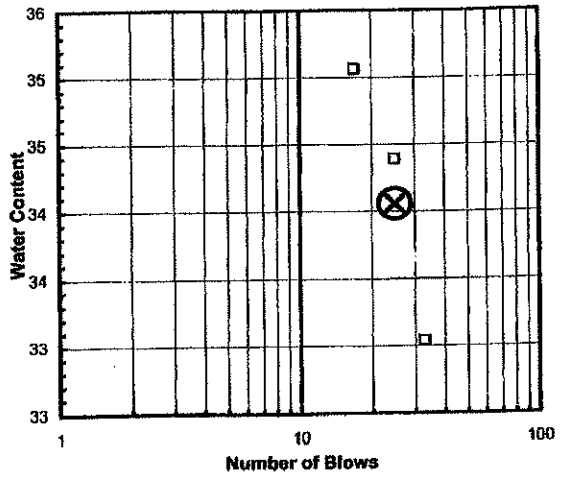
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-I	A-M	
Wt. of Tare & WS (gm)	22.95	21.38	
Wt. of Tare & DS (gm)	21.67	20.34	
Wt. of Tare (gm)	15.49	15.36	
Wt. of Water (gm)	1.3	1.0	
Wt. of DS (gm)	6.2	5.0	
Moisture Content (%)	**20.7**	**20.9**	**-0.2**

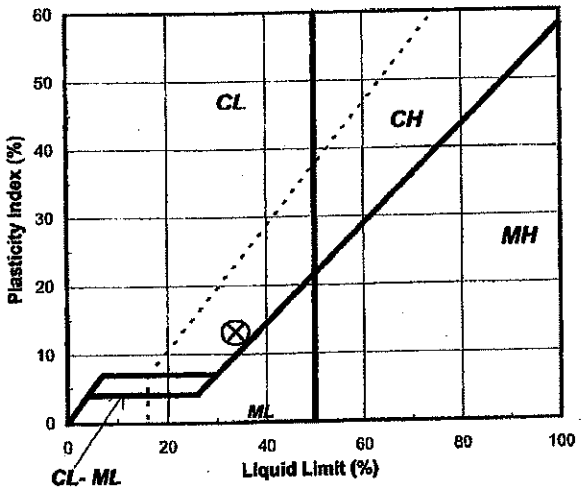
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**34**
Plastic Limit (%)	**21**
Plasticity Index (%)	**13**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-04	Sample No.	PC8K
Lab ID	2008-606-04-04	Soil Description	**DARK BROWN LEAN CLAY**
			(Minus No. 40 sieve material, Airdried)

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.

Liquid Limit Test	**1**	**2**	**3**
Tare Number	H	E	D
Wt. of Tare & WS (gm)	29.72	33.20	28.60
Wt. of Tare & DS (gm)	26.26	29.09	25.54
Wt. of Tare (gm)	15.14	15.32	15.12
Wt. of Water (gm)	3.5	4.1	3.1
Wt. of DS (gm)	11.1	13.8	10.4
Moisture Content (%)	**31.1**	**29.8**	**29.4**
Number of Blows	**15**	**25**	**35**

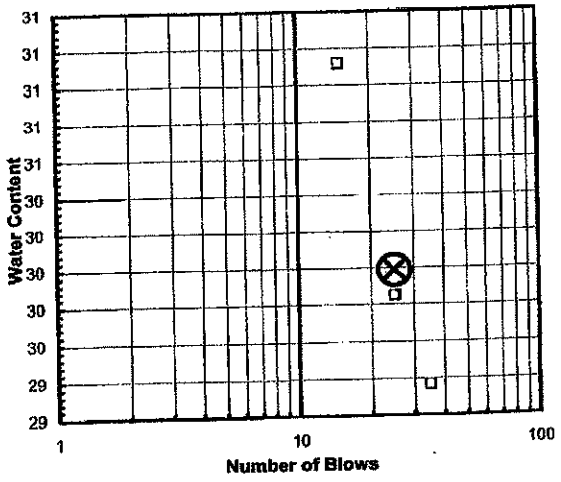
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	U	F	
Wt. of Tare & WS (gm)	22.14	22.23	
Wt. of Tare & DS (gm)	21.16	21.22	
Wt. of Tare (gm)	15.22	15.12	
Wt. of Water (gm)	1.0	1.0	
Wt. of DS (gm)	5.9	6.1	
Moisture Content (%)	**16.5**	**16.6**	**-0.1**

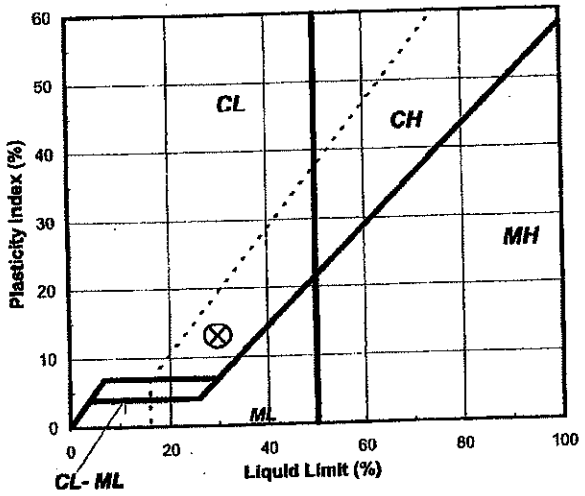
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**30**
Plastic Limit (%)	**17**
Plasticity Index (%)	**13**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC12K
Lab ID	2008-606-05-01	Soil Description	**DARK BROWN LEAN CLAY**
			(Minus No. 40 sieve material, Airdried)

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.

Liquid Limit Test	**1**	**2**	**3**
Tare Number	A	Y	I
Wt. of Tare & WS (gm)	26.29	25.58	27.40
Wt. of Tare & DS (gm)	23.29	23.00	24.36
Wt. of Tare (gm)	15.25	15.61	15.23
Wt. of Water (gm)	3.0	2.6	3.0
Wt. of DS (gm)	8.0	7.4	9.1
Moisture Content (%)	**37.3**	**34.9**	**33.3**
Number of Blows	**15**	**25**	**32**

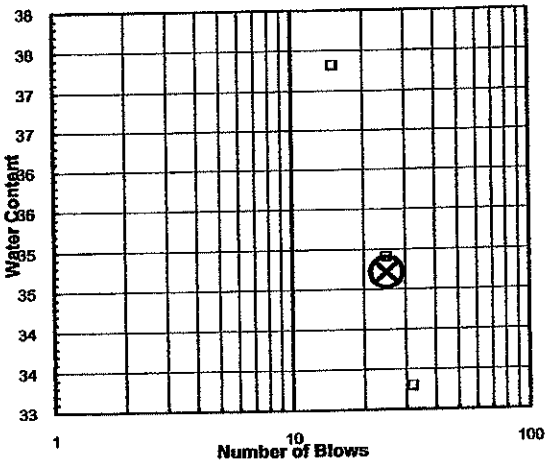
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	D	A-H	
Wt. of Tare & WS (gm)	22.20	21.65	
Wt. of Tare & DS (gm)	21.06	20.67	
Wt. of Tare (gm)	15.17	15.57	
Wt. of Water (gm)	1.1	1.0	
Wt. of DS (gm)	5.9	5.1	
Moisture Content (%)	**19.4**	**19.2**	**0.1**

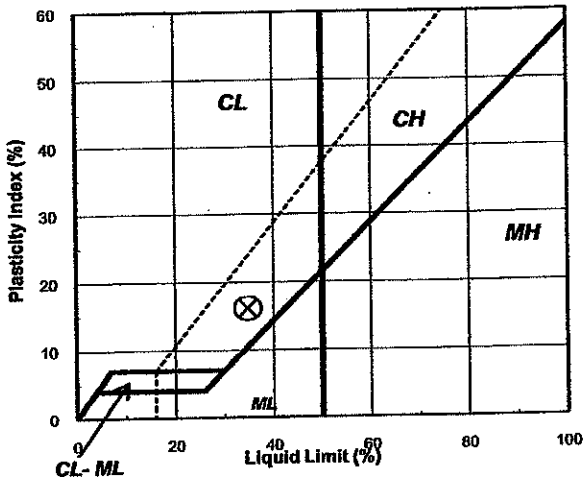
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**35**
Plastic Limit (%)	**19**
Plasticity Index (%)	**16**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By S.D. *Date* 8.27.08 *Checked By* JEB *Date* 8.28.08

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC16K
Lab ID	2008-606-05-02	Soil Description	**DARK 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)

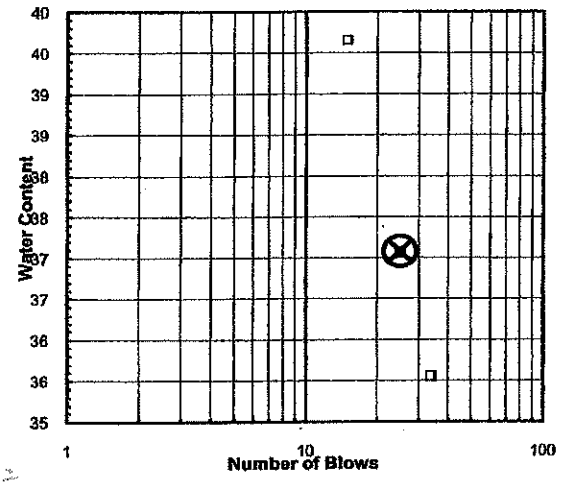
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	C	H	Q	**U**
Wt. of Tare & WS (gm)	27.10	27.38	26.80	**L**
Wt. of Tare & DS (gm)	23.73	24.07	23.75	**T**
Wt. of Tare (gm)	15.23	15.14	15.17	**I**
Wt. of Water (gm)	3.4	3.3	3.1	**P**
Wt. of DS (gm)	8.5	8.9	8.6	**O**
				I
Moisture Content (%)	**39.6**	**37.1**	**35.5**	**N**
Number of Blows	**15**	**25**	**34**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	S	T	
Wt. of Tare & WS (gm)	21.92	21.37	
Wt. of Tare & DS (gm)	20.79	20.34	
Wt. of Tare (gm)	15.22	15.19	
Wt. of Water (gm)	1.1	1.0	
Wt. of DS (gm)	5.6	5.2	
Moisture Content (%)	**20.3**	**20.0**	**0.3**

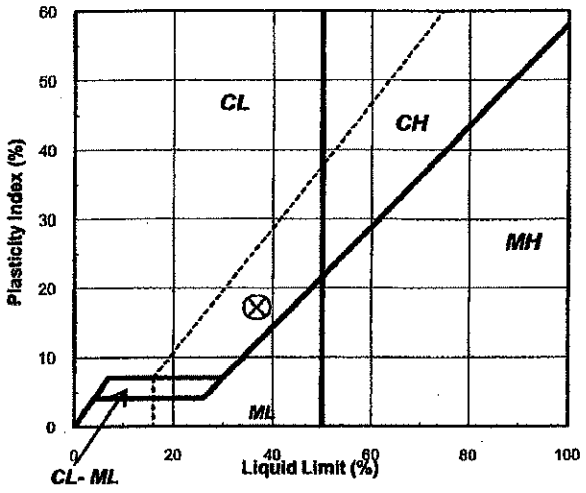
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**37**
Plastic Limit (%)	**20**
Plasticity Index (%)	**17**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By S.D. *Date* 8.27.08 *Checked By* JRB *Date* 8.28.08

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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-05	Sample No.	PC20K
Lab ID	2008-606-05-03	Soil Description	**RED 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	V	B	R
Wt. of Tare & WS (gm)	30.29	29.09	31.80
Wt. of Tare & DS (gm)	25.75	25.26	27.37
Wt. of Tare (gm)	15.25	15.20	15.15
Wt. of Water (gm)	4.5	3.8	4.4
Wt. of DS (gm)	10.5	10.1	12.2
Moisture Content (%)	**43.2**	**38.1**	**36.3**
Number of Blows	**15**	**25**	**35**

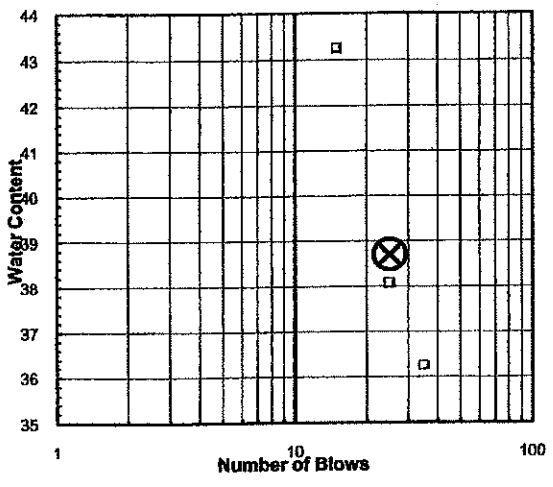
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	L	U	
Wt. of Tare & WS (gm)	21.97	23.91	
Wt. of Tare & DS (gm)	20.67	22.29	
Wt. of Tare (gm)	15.22	15.18	
Wt. of Water (gm)	1.3	1.6	
Wt. of DS (gm)	5.5	7.1	
Moisture Content (%)	**23.9**	**22.8**	**1.1**

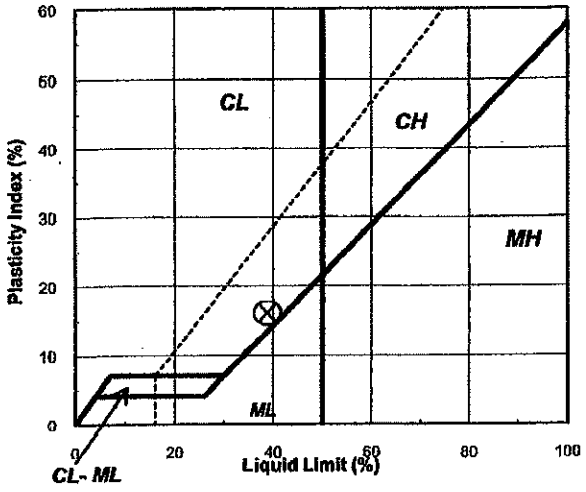
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**39**
Plastic Limit (%)	**23**
Plasticity Index (%)	**16**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By J.B.D. *Date* 8.27.08 *Checked By* JRB *Date* 8.28.08

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC24K
Lab ID	2008-606-07-01	Soil Description	**DARK 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	J	W	O
Wt. of Tare & WS (gm)	27.18	28.18	28.45
Wt. of Tare & DS (gm)	24.21	25.09	25.42
Wt. of Tare (gm)	15.15	15.14	15.24
Wt. of Water (gm)	3.0	3.1	3.0
Wt. of DS (gm)	9.1	10.0	10.2
Moisture Content (%)	**32.8**	**31.1**	**29.8**
Number of Blows	**15**	**25**	**34**

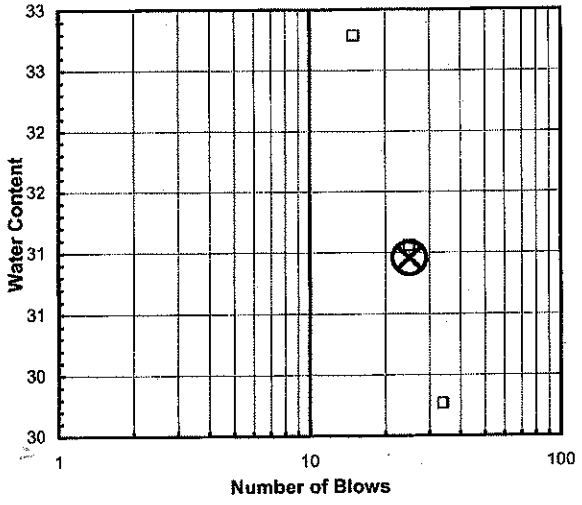
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	M	D	
Wt. of Tare & WS (gm)	22.23	22.45	
Wt. of Tare & DS (gm)	21.07	21.27	
Wt. of Tare (gm)	15.12	15.16	
Wt. of Water (gm)	1.2	1.2	
Wt. of DS (gm)	6.0	6.1	
Moisture Content (%)	**19.5**	**19.3**	**0.2**

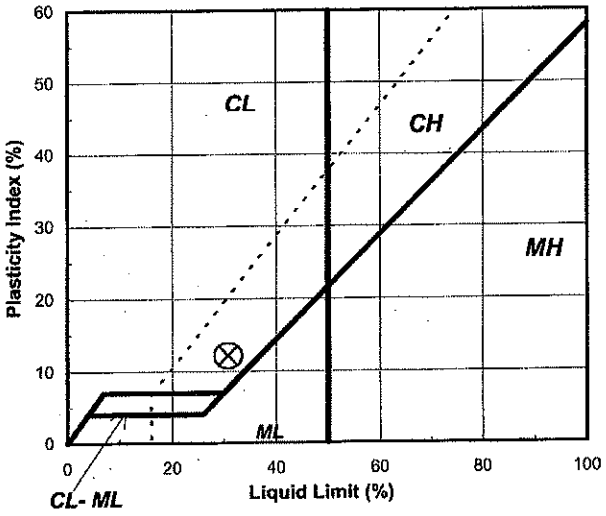
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**31**
Plastic Limit (%)	**19**
Plasticity Index (%)	**12**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO.MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-07	Sample No.	PC28K
Lab ID	2008-606-07-02	Soil Description	**DARK 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	A-I	A-K	A-N
Wt. of Tare & WS (gm)	30.92	31.10	31.53
Wt. of Tare & DS (gm)	27.10	27.51	27.95
Wt. of Tare (gm)	15.48	15.56	15.43
Wt. of Water (gm)	3.8	3.6	3.6
Wt. of DS (gm)	11.6	12.0	12.5
Moisture Content (%)	**32.9**	**30.0**	**28.6**
Number of Blows	**15**	**25**	**35**

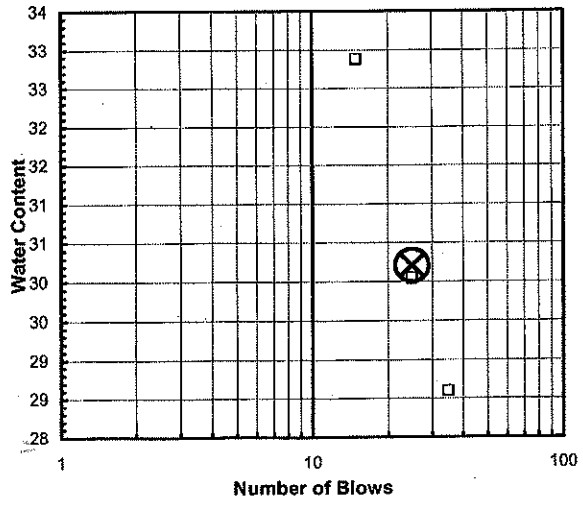
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-M	A-B	
Wt. of Tare & WS (gm)	22.90	21.13	
Wt. of Tare & DS (gm)	21.75	20.31	
Wt. of Tare (gm)	15.35	15.58	
Wt. of Water (gm)	1.2	0.8	
Wt. of DS (gm)	6.4	4.7	
Moisture Content (%)	**18.0**	**17.3**	**0.6**

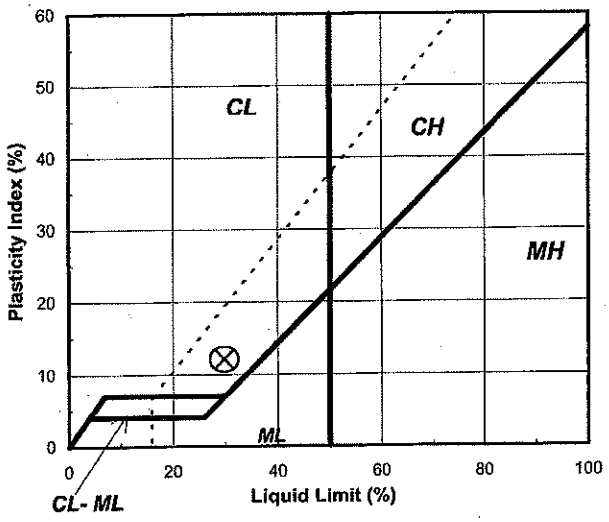
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**30**
Plastic Limit (%)	**18**
Plasticity Index (%)	**12**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By JBD *Date* 9/2/2008 *Checked By* GEM *Date* 9-3-08

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC32K
Lab ID	2008-606-08-01	Soil Description	**DARK 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)

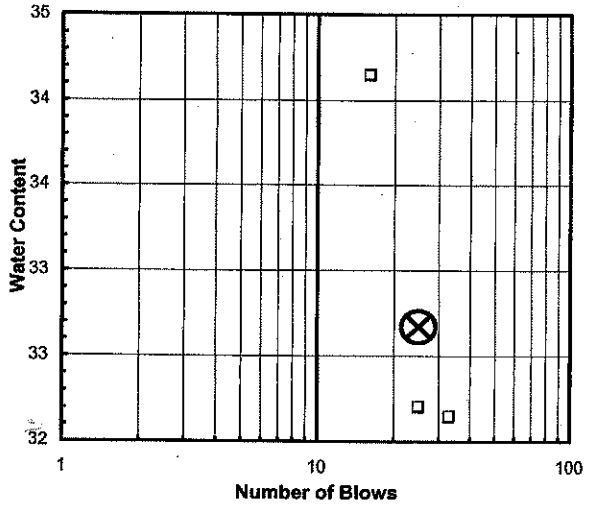
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	Q	Z-1	S	**U**
Wt. of Tare & WS (gm)	27.27	27.33	27.10	**L**
Wt. of Tare & DS (gm)	24.19	24.48	24.21	**T**
Wt. of Tare (gm)	15.17	15.63	15.22	**I**
Wt. of Water (gm)	3.1	2.9	2.9	**P**
Wt. of DS (gm)	9.0	8.9	9.0	**O**
				I
Moisture Content (%)	**34.1**	**32.2**	**32.1**	**N**
Number of Blows	**16**	**25**	**33**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	T	C	
Wt. of Tare & WS (gm)	22.94	22.44	
Wt. of Tare & DS (gm)	21.76	21.32	
Wt. of Tare (gm)	15.20	15.24	
Wt. of Water (gm)	1.2	1.1	
Wt. of DS (gm)	6.6	6.1	
Moisture Content (%)	**18.0**	**18.4**	**-0.4**

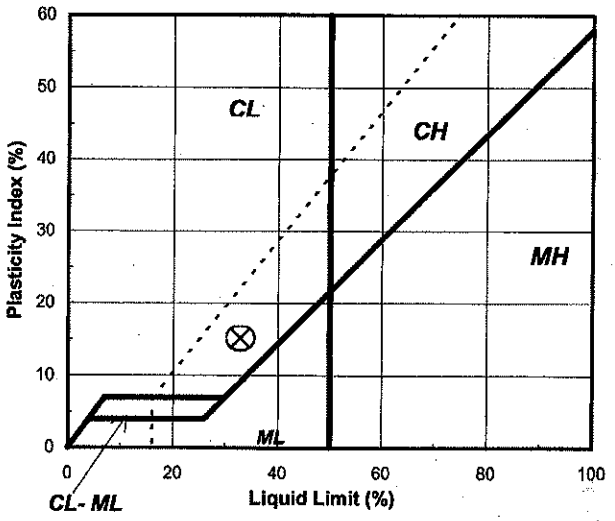
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**33**
Plastic Limit (%)	**18**
Plasticity Index (%)	**15**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	PC36K
Lab ID	2008-606-08-02	Soil Description	**DARK 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)

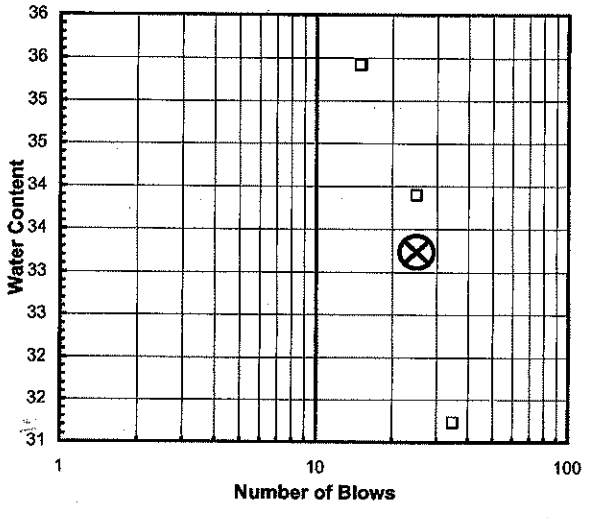
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	Y	N	E	M U L T I P O I N T
Wt. of Tare & WS (gm)	34.92	32.02	31.74	
Wt. of Tare & DS (gm)	29.87	27.79	27.83	
Wt. of Tare (gm)	15.61	15.31	15.31	
Wt. of Water (gm)	5.1	4.2	3.9	
Wt. of DS (gm)	14.3	12.5	12.5	
Moisture Content (%)	**35.4**	**33.9**	**31.2**	
Number of Blows	**15**	**25**	**35**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A	I	
Wt. of Tare & WS (gm)	22.46	22.21	
Wt. of Tare & DS (gm)	21.43	21.21	
Wt. of Tare (gm)	15.26	15.23	
Wt. of Water (gm)	1.0	1.0	
Wt. of DS (gm)	6.2	6.0	
Moisture Content (%)	**16.7**	**16.7**	**0.0**

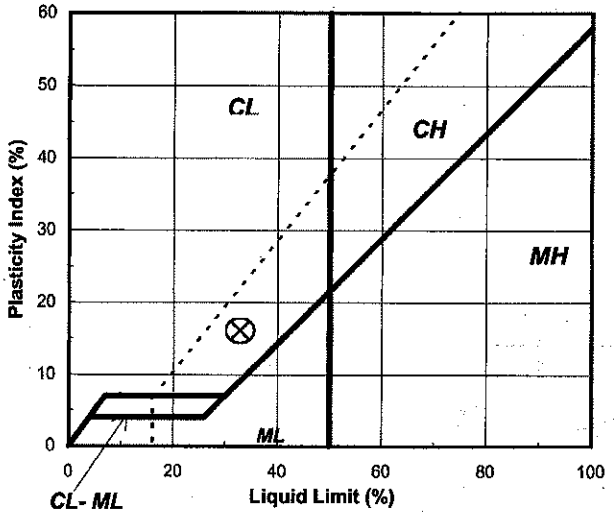
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**33**
Plastic Limit (%)	**17**
Plasticity Index (%)	**16**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By JBD *Date* 9/9/2008 *Checked By* GEM *Date* 9-10-08

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION. CO INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-09	Sample No.	PC-40K
Lab ID	2008-606-09-01	Soil Description	**DARK 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)

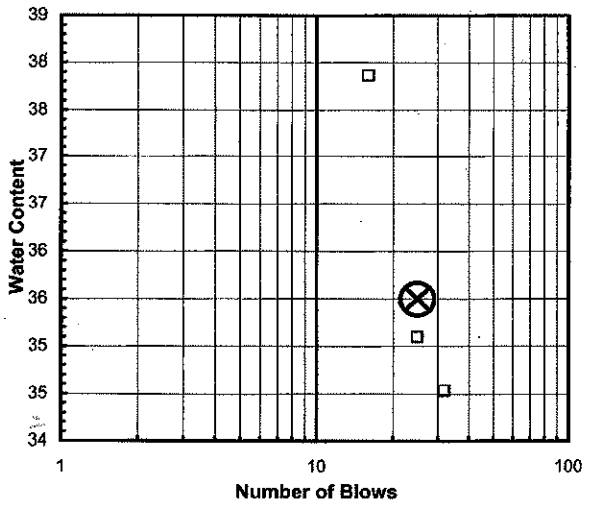
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	H	T	Q	**U**
Wt. of Tare & WS (gm)	28.03	27.48	28.66	**L**
Wt. of Tare & DS (gm)	24.49	24.29	25.20	**T**
Wt. of Tare (gm)	15.14	15.20	15.18	**I**
Wt. of Water (gm)	3.5	3.2	3.5	**P**
Wt. of DS (gm)	9.4	9.1	10.0	**O**
				I
Moisture Content (%)	**37.9**	**35.1**	**34.5**	**N**
Number of Blows	**16**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	S	C	
Wt. of Tare & WS (gm)	22.22	22.82	
Wt. of Tare & DS (gm)	21.13	21.61	
Wt. of Tare (gm)	15.22	15.24	
Wt. of Water (gm)	1.1	1.2	
Wt. of DS (gm)	5.9	6.4	
Moisture Content (%)	**18.4**	**19.0**	**-0.6**

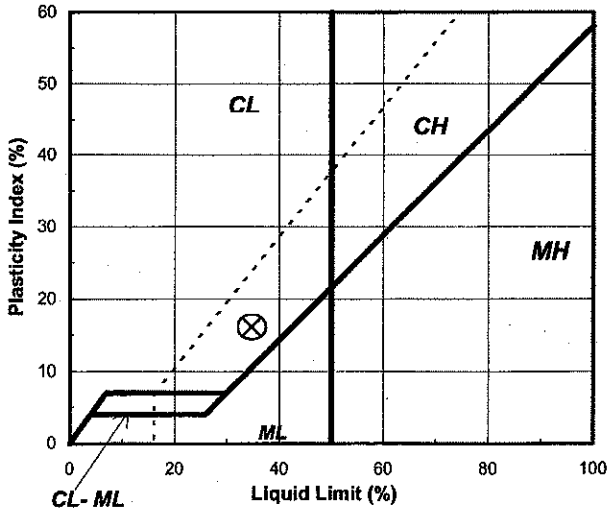
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**35**
Plastic Limit (%)	**19**
Plasticity Index (%)	**16**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 9/18/2008 *Checked By* Gem *Date* 9-22-08

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	2
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-02	Soil Description	**BROWN/RED 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)

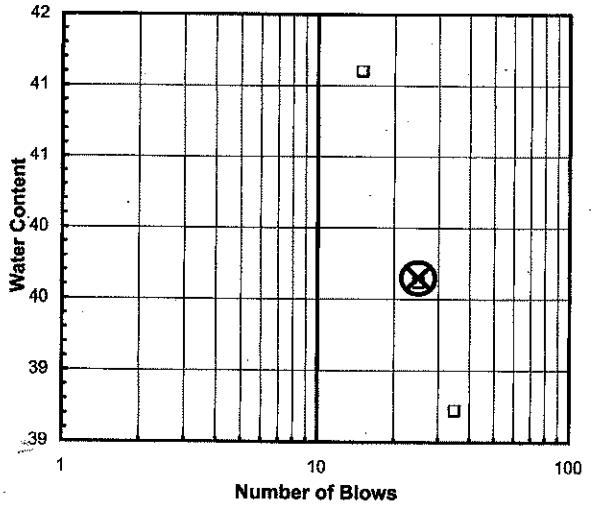
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	F-2	26	L-1	**U**
Wt. of Tare & WS (gm)	34.11	36.09	31.84	**L**
Wt. of Tare & DS (gm)	28.80	31.19	27.36	**T**
Wt. of Tare (gm)	15.88	18.82	15.79	**I**
Wt. of Water (gm)	5.3	4.9	4.5	**P**
Wt. of DS (gm)	12.9	12.4	11.6	**O**
				I
Moisture Content (%)	**41.1**	**39.6**	**38.7**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	G-1	V-1	
Wt. of Tare & WS (gm)	28.56	28.56	
Wt. of Tare & DS (gm)	27.54	27.47	
Wt. of Tare (gm)	22.12	21.94	
Wt. of Water (gm)	1.0	1.1	
Wt. of DS (gm)	5.4	5.5	
Moisture Content (%)	**18.8**	**19.7**	**-0.9**

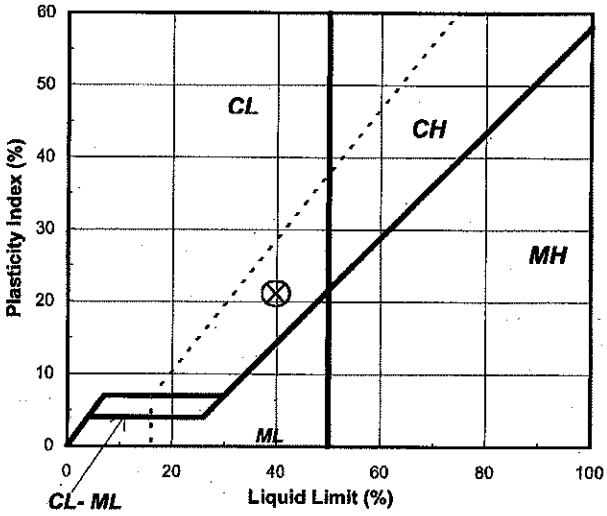
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**40**
Plastic Limit (%)	**19**
Plasticity Index (%)	**21**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	3
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-03	Soil Description	**TAN 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)

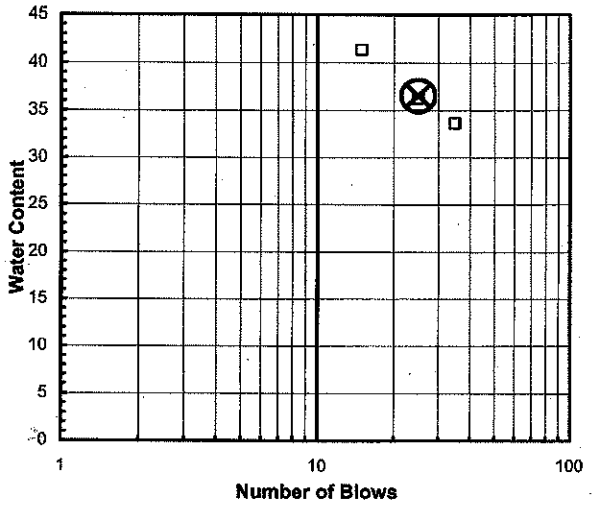
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	T	L	B	**U**
Wt. of Tare & WS (gm)	27.30	27.12	25.76	**L**
Wt. of Tare & DS (gm)	23.76	23.97	23.10	**T**
Wt. of Tare (gm)	15.19	15.27	15.19	**I**
Wt. of Water (gm)	3.5	3.2	2.7	**P**
Wt. of DS (gm)	8.6	8.7	7.9	**O**
				I
Moisture Content (%)	**41.3**	**36.2**	**33.6**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	R	V	
Wt. of Tare & WS (gm)	22.79	22.06	
Wt. of Tare & DS (gm)	20.91	20.36	
Wt. of Tare (gm)	15.16	15.25	
Wt. of Water (gm)	1.9	1.7	
Wt. of DS (gm)	5.8	5.1	
Moisture Content (%)	**32.7**	**33.3**	**-0.6**

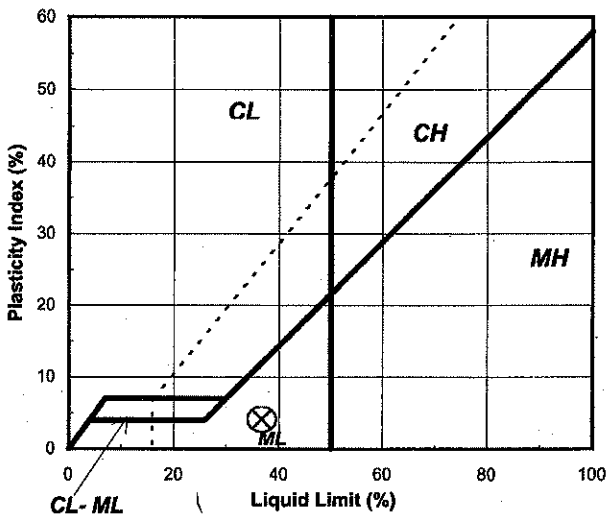
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**37**
Plastic Limit (%)	**33**
Plasticity Index (%)	**4**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	4
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-04	Soil Description	**DARK 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	C	W	K
Wt. of Tare & WS (gm)	30.31	30.26	32.00
Wt. of Tare & DS (gm)	25.92	25.94	27.24
Wt. of Tare (gm)	15.24	15.14	15.24
Wt. of Water (gm)	4.4	4.3	4.8
Wt. of DS (gm)	10.7	10.8	12.0
Moisture Content (%)	**41.1**	**40.0**	**39.7**
Number of Blows	**15**	**25**	**35**

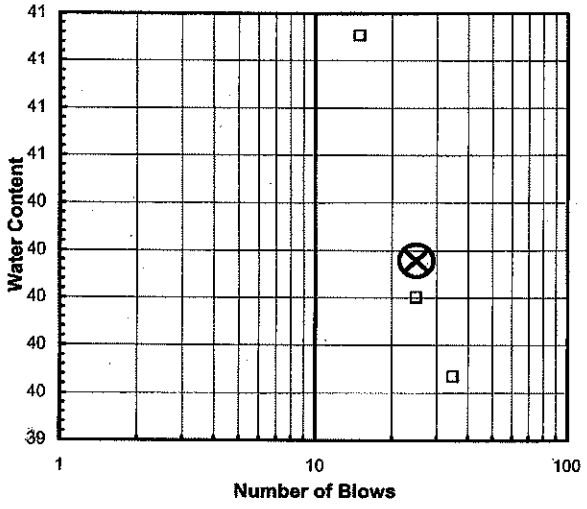
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	G	M	
Wt. of Tare & WS (gm)	22.36	22.46	
Wt. of Tare & DS (gm)	21.12	21.18	
Wt. of Tare (gm)	15.04	15.16	
Wt. of Water (gm)	1.2	1.3	
Wt. of DS (gm)	6.1	6.0	
Moisture Content (%)	**20.4**	**21.3**	**-0.9**

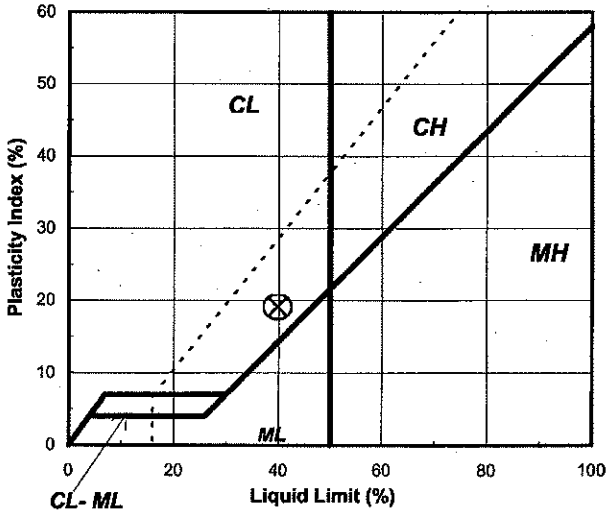
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**40**
Plastic Limit (%)	**21**
Plasticity Index (%)	**19**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	5
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-05	Soil Description	**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)

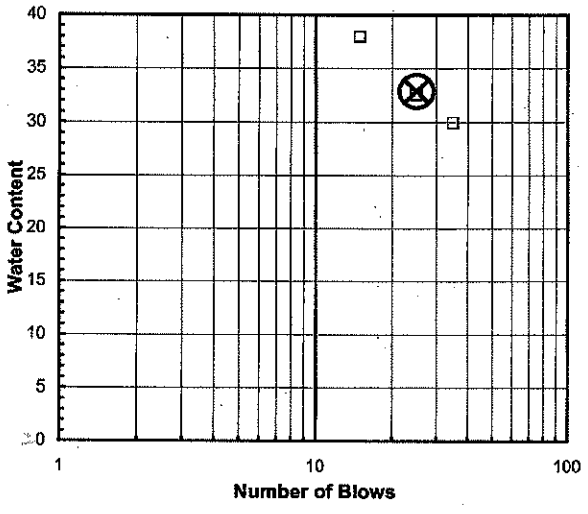
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	Q	D	F	**U**
Wt. of Tare & WS (gm)	30.92	28.61	28.72	**L**
Wt. of Tare & DS (gm)	26.59	25.32	25.59	**T**
Wt. of Tare (gm)	15.17	15.19	15.12	**I**
Wt. of Water (gm)	4.3	3.3	3.1	**P**
Wt. of DS (gm)	11.4	10.1	10.5	**O**
				I
Moisture Content (%)	**37.9**	**32.5**	**29.9**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	0	P	
Wt. of Tare & WS (gm)	21.31	21.42	
Wt. of Tare & DS (gm)	20.00	20.10	
Wt. of Tare (gm)	15.24	15.19	
Wt. of Water (gm)	1.3	1.3	
Wt. of DS (gm)	4.8	4.9	
Moisture Content (%)	**27.5**	**26.9**	**0.6**

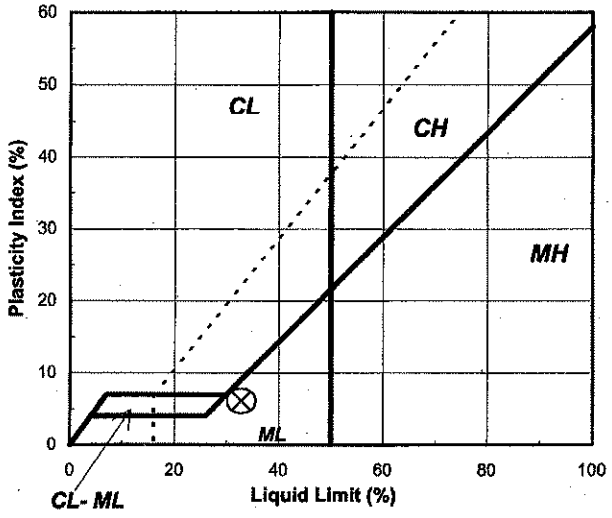
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**33**
Plastic Limit (%)	**27**
Plasticity Index (%)	**6**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	6
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-06	Soil Description	**ORANGE 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)

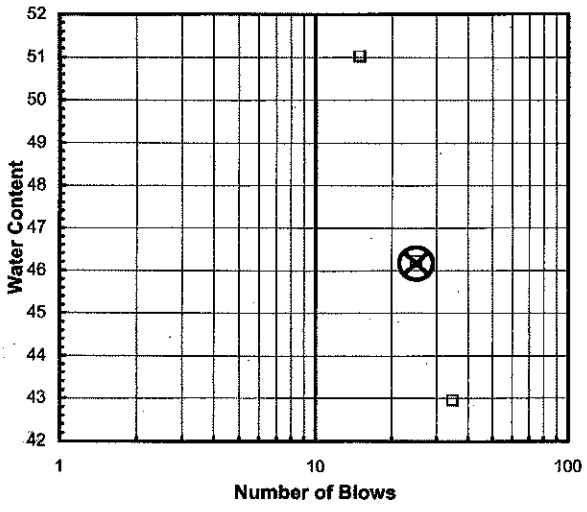
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	S	H	U	**U**
Wt. of Tare & WS (gm)	28.69	27.68	28.49	**L**
Wt. of Tare & DS (gm)	24.14	23.72	24.50	**T**
Wt. of Tare (gm)	15.22	15.15	15.21	**I**
Wt. of Water (gm)	4.6	4.0	4.0	**P**
Wt. of DS (gm)	8.9	8.6	9.3	**O**
				I
Moisture Content (%)	**51.0**	**46.2**	**42.9**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-D	A-O	
Wt. of Tare & WS (gm)	21.40	22.39	
Wt. of Tare & DS (gm)	19.69	20.44	
Wt. of Tare (gm)	15.40	15.45	
Wt. of Water (gm)	1.7	2.0	
Wt. of DS (gm)	4.3	5.0	
Moisture Content (%)	**39.9**	**39.1**	**0.8**

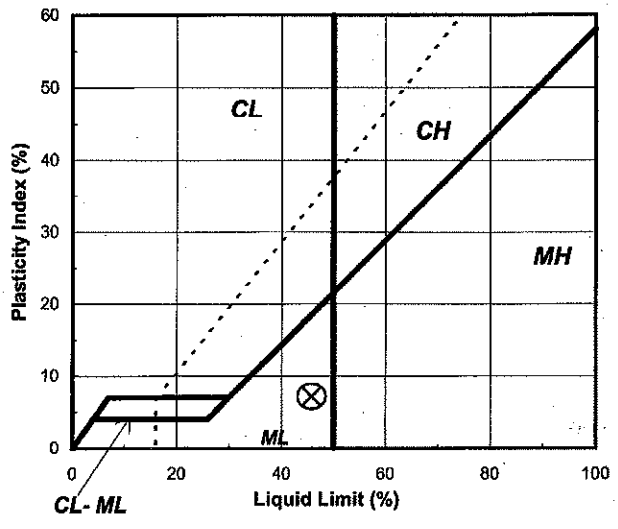
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**46**
Plastic Limit (%)	**39**
Plasticity Index (%)	**7**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	7
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-07	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)

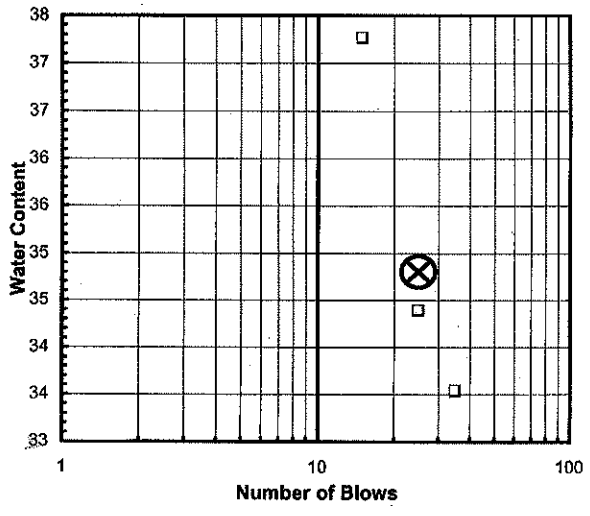
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	M	C	K	**U**
Wt. of Tare & WS (gm)	28.31	30.08	26.27	**L**
Wt. of Tare & DS (gm)	24.74	26.28	23.50	**T**
Wt. of Tare (gm)	15.16	15.23	15.24	**I**
Wt. of Water (gm)	3.6	3.8	2.8	**P**
Wt. of DS (gm)	9.6	11.1	8.3	**O**
				I
Moisture Content (%)	**37.3**	**34.4**	**33.5**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	G	W	
Wt. of Tare & WS (gm)	22.34	22.55	
Wt. of Tare & DS (gm)	20.51	20.68	
Wt. of Tare (gm)	15.04	15.13	
Wt. of Water (gm)	1.8	1.9	
Wt. of DS (gm)	5.5	5.6	
Moisture Content (%)	**33.5**	**33.7**	**-0.2**

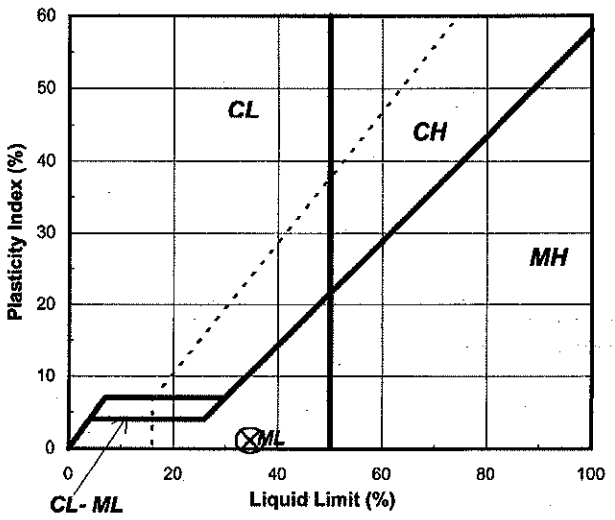
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**35**
Plastic Limit (%)	**34**
Plasticity Index (%)	**1**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	10
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-10	Soil Description	**TAN 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)

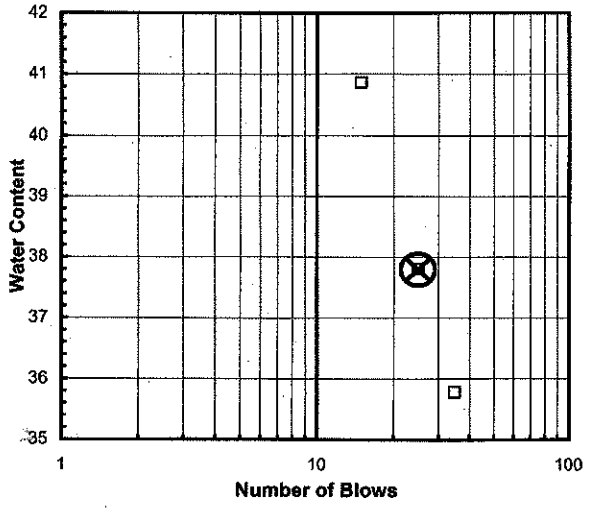
Liquid Limit Test	**1**	**2**	**3**	MULTIPOINT
Tare Number	U	H	S	
Wt. of Tare & WS (gm)	30.33	29.54	30.26	
Wt. of Tare & DS (gm)	25.95	25.59	26.30	
Wt. of Tare (gm)	15.23	15.14	15.23	
Wt. of Water (gm)	4.4	4.0	4.0	
Wt. of DS (gm)	10.7	10.5	11.1	
Moisture Content (%)	**40.9**	**37.8**	**35.8**	
Number of Blows	**15**	**25**	**35**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-D	A-O	
Wt. of Tare & WS (gm)	23.53	23.53	
Wt. of Tare & DS (gm)	21.47	21.51	
Wt. of Tare (gm)	15.40	15.45	
Wt. of Water (gm)	2.1	2.0	
Wt. of DS (gm)	6.1	6.1	
Moisture Content (%)	**33.9**	**33.3**	**0.6**

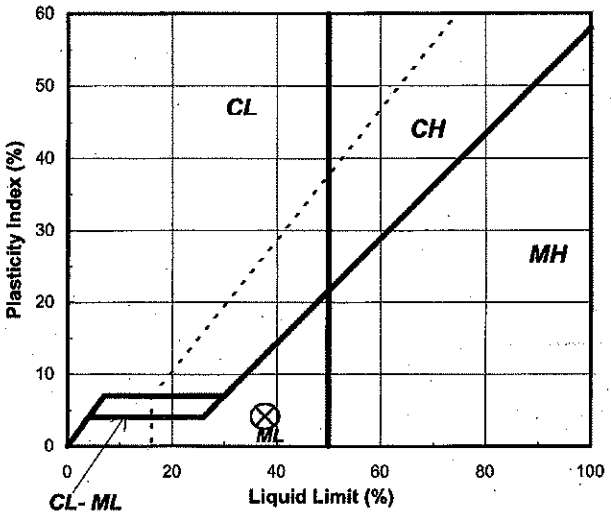
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**38**
Plastic Limit (%)	**34**
Plasticity Index (%)	**4**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMIT

ASTM D 4318-00 (SOP - S4)

Client	THALLE CONTRUCTION CO. INC.	Boring No.	11
Client Reference	N.WAKE CO. MSW LF CLOS.	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-11	Visual Description	**TAN SANDY SILT**
			(Minus No. 40 sieve material, Wet Method)

NON - PLASTIC MATERIAL

Tested By SD *Date* 10/1/08 *Checked By* MMS *Date* 10-1-08

DCN: CT-S4C DATE: 7-11-97 REVISION : 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-10-11 NP LIMIT.xls]Sheet1

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ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	12
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-12	Soil Description	**REDDISH 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)

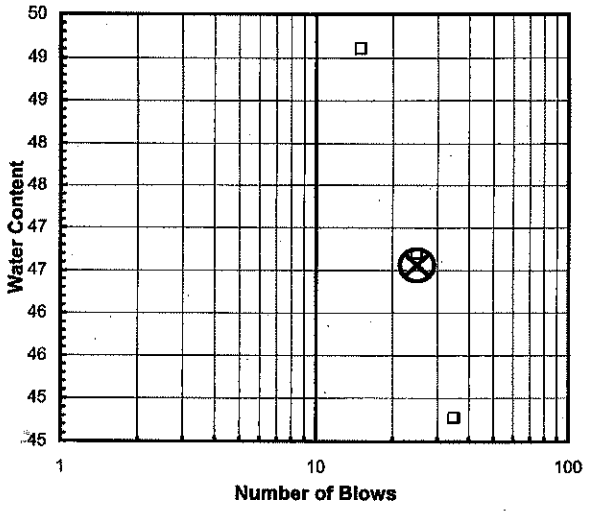
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-M	A-Q	A-F	**U**
Wt. of Tare & WS (gm)	31.95	27.51	30.74	**L**
Wt. of Tare & DS (gm)	26.49	23.70	26.03	**T**
Wt. of Tare (gm)	15.37	15.54	15.51	**I**
Wt. of Water (gm)	5.5	3.8	4.7	**P**
Wt. of DS (gm)	11.1	8.2	10.5	**O**
				I
Moisture Content (%)	**49.1**	**46.7**	**44.8**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	B-B	A-C	
Wt. of Tare & WS (gm)	23.32	22.63	
Wt. of Tare & DS (gm)	21.77	21.25	
Wt. of Tare (gm)	15.54	15.67	
Wt. of Water (gm)	1.6	1.4	
Wt. of DS (gm)	6.2	5.6	
Moisture Content (%)	**24.9**	**24.7**	**0.1**

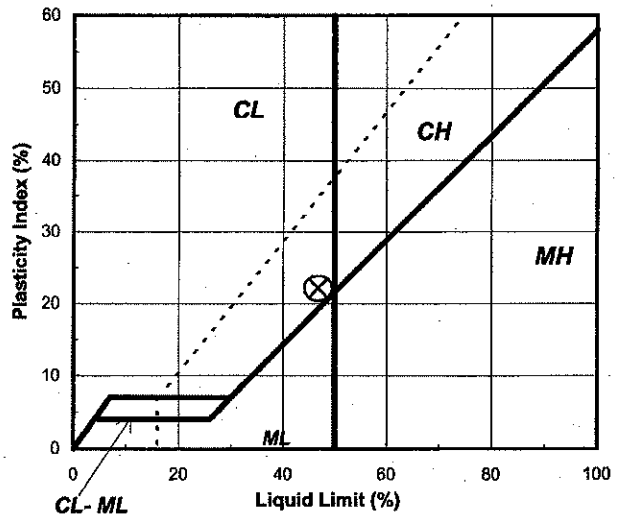
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**47**
Plastic Limit (%)	**25**
Plasticity Index (%)	**22**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	13
Client Reference	NORTH WAKE CO.MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-13	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)

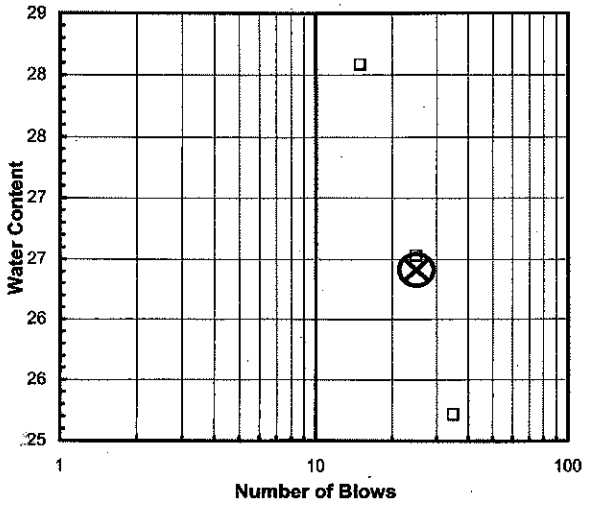
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	R	L	V	**U**
Wt. of Tare & WS (gm)	29.39	29.11	28.46	**L**
Wt. of Tare & DS (gm)	26.27	26.20	25.80	**T**
Wt. of Tare (gm)	15.16	15.23	15.25	**I**
Wt. of Water (gm)	3.1	2.9	2.7	**P**
Wt. of DS (gm)	11.1	11.0	10.6	**O**
				I
Moisture Content (%)	**28.1**	**26.5**	**25.2**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	B	T	
Wt. of Tare & WS (gm)	22.31	23.50	
Wt. of Tare & DS (gm)	21.02	22.02	
Wt. of Tare (gm)	15.19	15.20	
Wt. of Water (gm)	1.3	1.5	
Wt. of DS (gm)	5.8	6.8	
Moisture Content (%)	**22.1**	**21.7**	**0.4**

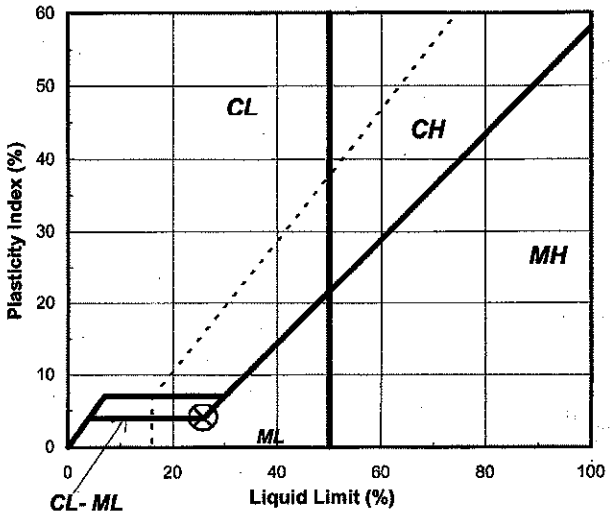
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**26**
Plastic Limit (%)	**22**
Plasticity Index (%)	**4**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	15
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-15	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)

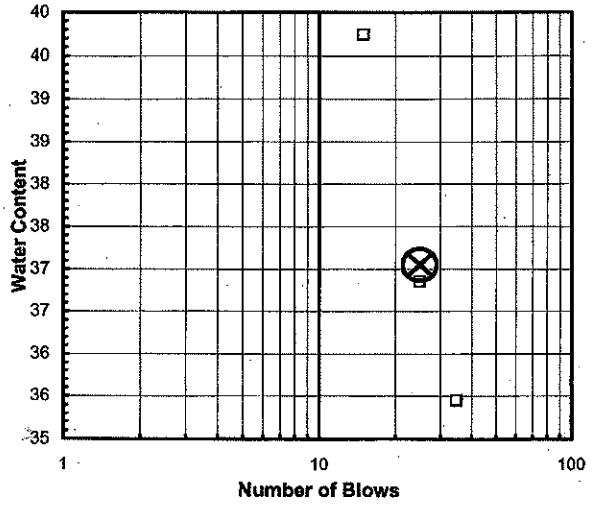
Liquid Limit Test	**1**	**2**	**3**	**MULTIPOINT**
Tare Number	K-A	A-T	A-I	
Wt. of Tare & WS (gm)	29.76	37.40	31.91	
Wt. of Tare & DS (gm)	25.83	31.53	27.61	
Wt. of Tare (gm)	15.94	15.60	15.48	
Wt. of Water (gm)	3.9	5.9	4.3	
Wt. of DS (gm)	9.9	15.9	12.1	
Moisture Content (%)	**39.7**	**36.8**	**35.4**	
Number of Blows	**15**	**25**	**35**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-N	J	
Wt. of Tare & WS (gm)	22.64	21.72	
Wt. of Tare & DS (gm)	21.53	20.69	
Wt. of Tare (gm)	15.47	15.16	
Wt. of Water (gm)	1.1	1.0	
Wt. of DS (gm)	6.1	5.5	
Moisture Content (%)	**18.3**	**18.6**	**-0.3**

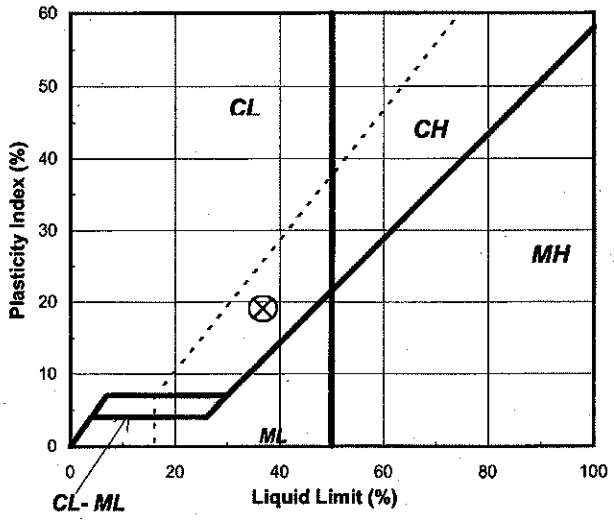
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**37**
Plastic Limit (%)	**18**
Plasticity Index (%)	**19**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
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ATTERBERG LIMIT

ASTM D 4318-00 (SOP - S4)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	16
Client Reference	NORTH WAKE CO. MSW LF CLOSER	Depth (ft)	NA
Project No.	2008-606-10	Sample No.	NA
Lab ID	2008-606-10-16	Soil Description	**TAN/ORANGE SANDY SILT**
			(Minus No. 40 sieve material, Wet Method)

NON - PLASTIC MATERIAL

Tested By JBD *Date* 10/2/2008 *Checked By* MMS *Date* 10-3-08

DCN: CT-S4C DATE: 7-11-97 REVISION : 2

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	N/A
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	P.C.92K
Lab ID	2008-606-11-01	Soil Description	**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)

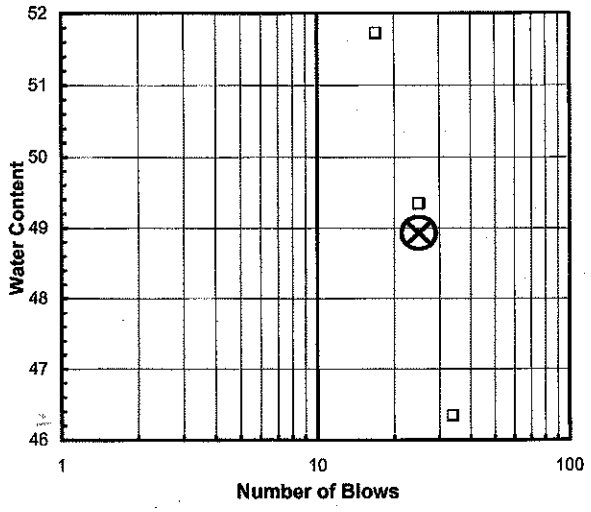
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-D	K-A	A-T	**U**
Wt. of Tare & WS (gm)	27.31	26.76	27.96	**L**
Wt. of Tare & DS (gm)	23.25	23.04	24.04	**T**
Wt. of Tare (gm)	15.40	15.50	15.58	**I**
Wt. of Water (gm)	4.1	3.7	3.9	**P**
Wt. of DS (gm)	7.9	7.5	8.5	**O**
				I
Moisture Content (%)	**51.7**	**49.3**	**46.3**	**N**
Number of Blows	**17**	**25**	**34**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-N	B-B	
Wt. of Tare & WS (gm)	21.72	21.80	
Wt. of Tare & DS (gm)	20.35	20.45	
Wt. of Tare (gm)	15.43	15.51	
Wt. of Water (gm)	1.4	1.4	
Wt. of DS (gm)	4.9	4.9	
Moisture Content (%)	**27.8**	**27.3**	**0.5**

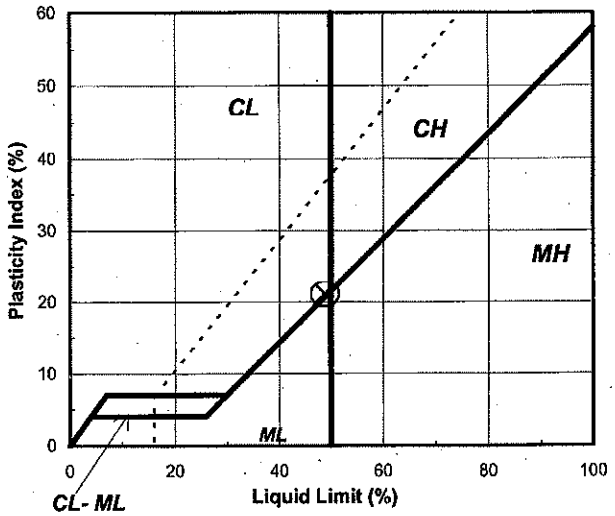
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**49**
Plastic Limit (%)	**28**
Plasticity Index (%)	**21**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO. INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C 96 K
Lab ID	2008-606-11-02	Soil Description	**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)

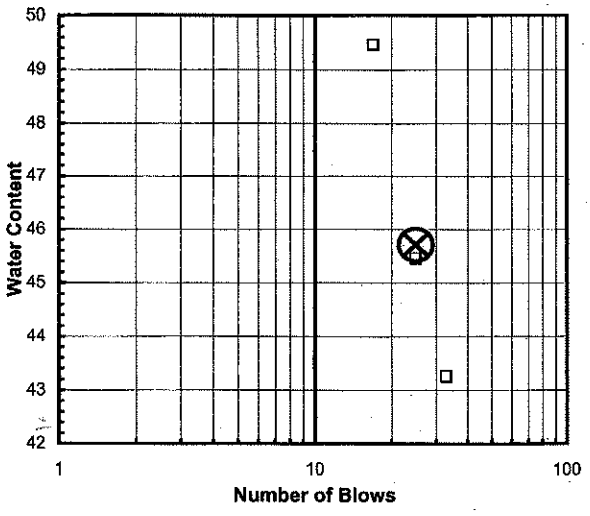
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	I	Y	J	**U**
Wt. of Tare & WS (gm)	28.85	27.66	27.13	**L**
Wt. of Tare & DS (gm)	24.34	23.91	23.51	**T**
Wt. of Tare (gm)	15.22	15.66	15.14	**I**
Wt. of Water (gm)	4.5	3.8	3.6	**P**
Wt. of DS (gm)	9.1	8.3	8.4	**O**
				I
Moisture Content (%)	**49.5**	**45.5**	**43.2**	**N**
Number of Blows	**17**	**25**	**33**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	N	U	
Wt. of Tare & WS (gm)	22.32	21.46	
Wt. of Tare & DS (gm)	20.74	20.05	
Wt. of Tare (gm)	15.29	15.18	
Wt. of Water (gm)	1.6	1.4	
Wt. of DS (gm)	5.5	4.9	
Moisture Content (%)	**29.0**	**29.0**	**0.0**

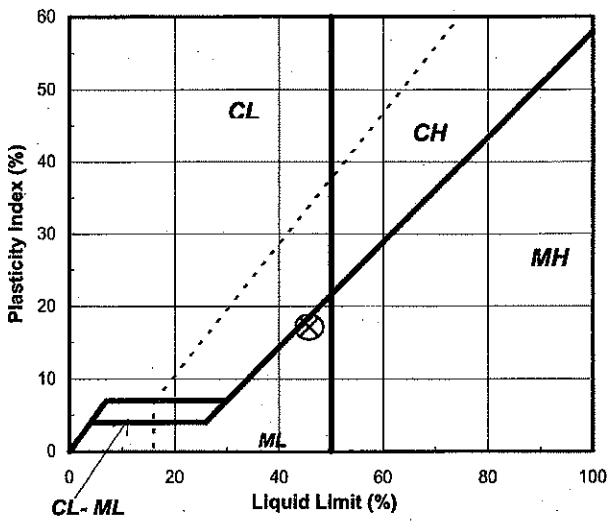
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**46**
Plastic Limit (%)	**29**
Plasticity Index (%)	**17**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-11	Sample No.	P.C. 100K
Lab ID	2008-606-11-03	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)

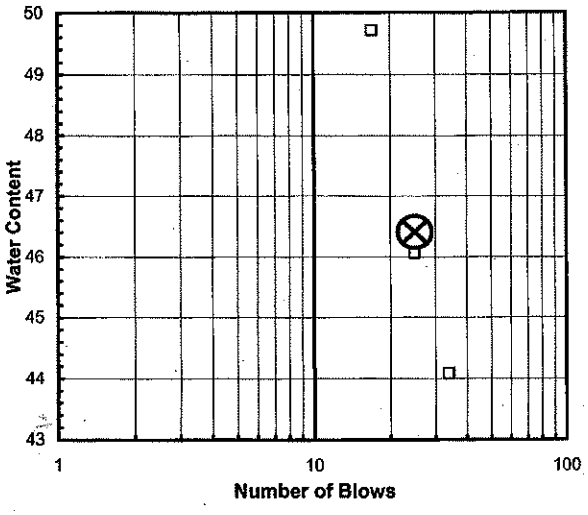
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-M	A-B	A-F	**U**
Wt. of Tare & WS (gm)	25.84	26.52	27.65	**L**
Wt. of Tare & DS (gm)	22.36	23.07	23.93	**T**
Wt. of Tare (gm)	15.36	15.58	15.49	**I**
Wt. of Water (gm)	3.5	3.5	3.7	**P**
Wt. of DS (gm)	7.0	7.5	8.4	**O**
				I
Moisture Content (%)	**49.7**	**46.1**	**44.1**	**N**
Number of Blows	**17**	**25**	**34**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	T	E	
Wt. of Tare & WS (gm)	22.00	22.52	
Wt. of Tare & DS (gm)	20.58	20.99	
Wt. of Tare (gm)	15.21	15.31	
Wt. of Water (gm)	1.4	1.5	
Wt. of DS (gm)	5.4	5.7	
Moisture Content (%)	**26.4**	**26.9**	**-0.5**

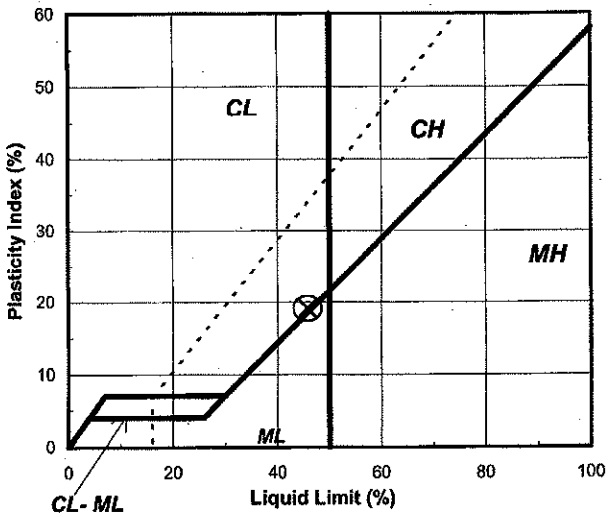
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**46**
Plastic Limit (%)	**27**
Plasticity Index (%)	**19**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	P.C. 104K
Lab ID	2008-606-11-04	Soil Description	**GRAY/BROWN 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)

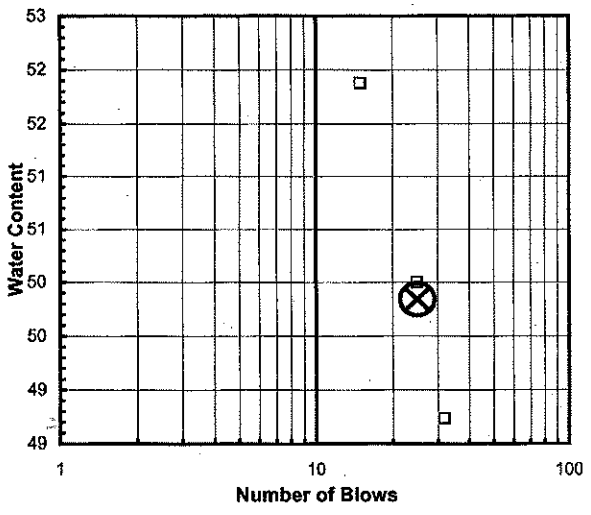
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-M	A-B	A-F	**U**
Wt. of Tare & WS (gm)	26.31	25.78	26.62	**L**
Wt. of Tare & DS (gm)	22.57	22.38	22.97	**T**
Wt. of Tare (gm)	15.36	15.58	15.48	**I**
Wt. of Water (gm)	3.7	3.4	3.7	**P**
Wt. of DS (gm)	7.2	6.8	7.5	**O**
				I
Moisture Content (%)	**51.9**	**50.0**	**48.7**	**N**
Number of Blows	**15**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	E	T	
Wt. of Tare & WS (gm)	21.89	21.53	
Wt. of Tare & DS (gm)	20.42	20.12	
Wt. of Tare (gm)	15.31	15.20	
Wt. of Water (gm)	1.5	1.4	
Wt. of DS (gm)	5.1	4.9	
Moisture Content (%)	**28.8**	**28.7**	**0.1**

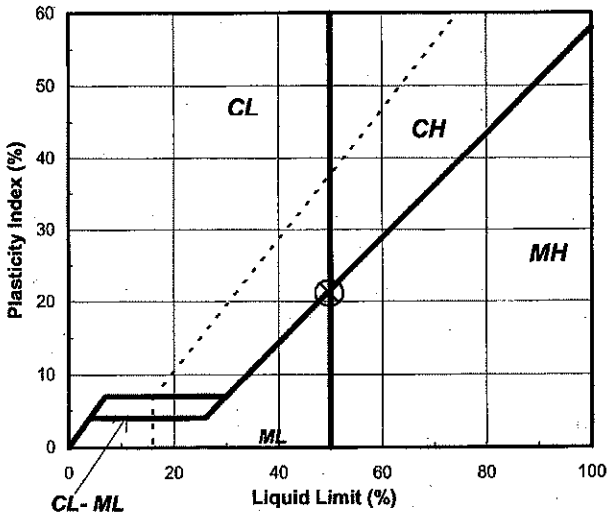
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**50**
Plastic Limit (%)	**29**
Plasticity Index (%)	**21**
USCS Symbol	**MH**

Flow Curve



Plasticity Chart



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ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	P.C. 108K
Lab ID	2008-606-11-05	Soil Description	**BROWN 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)

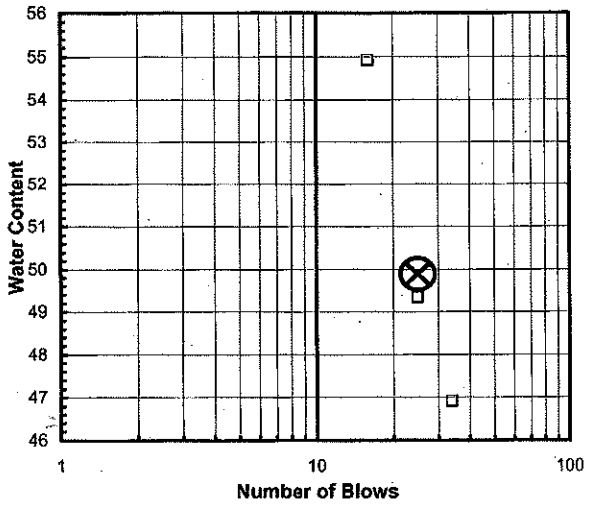
Liquid Limit Test	**1**	**2**	**3**	MULTIPOINT
Tare Number	A-D	K-A	A-T	
Wt. of Tare & WS (gm)	26.44	27.82	27.92	
Wt. of Tare & DS (gm)	22.53	23.75	23.98	
Wt. of Tare (gm)	15.41	15.50	15.58	
Wt. of Water (gm)	3.9	4.1	3.9	
Wt. of DS (gm)	7.1	8.3	8.4	
Moisture Content (%)	**54.9**	**49.3**	**46.9**	
Number of Blows	**16**	**25**	**34**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-N	B-B	
Wt. of Tare & WS (gm)	22.23	21.71	
Wt. of Tare & DS (gm)	20.53	20.16	
Wt. of Tare (gm)	15.43	15.52	
Wt. of Water (gm)	1.7	1.6	
Wt. of DS (gm)	5.1	4.6	
Moisture Content (%)	**33.3**	**33.4**	**-0.1**

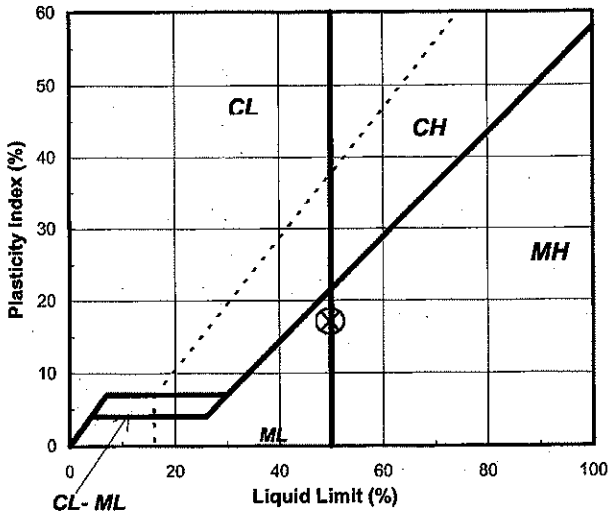
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**50**
Plastic Limit (%)	**33**
Plasticity Index (%)	**17**
USCS Symbol	**MH**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 112K
Lab ID	2009-633-01-06	Soil Description	**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)

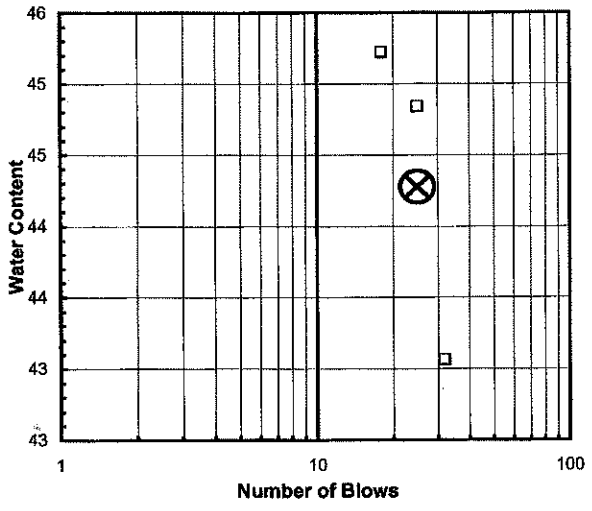
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	V	L	A-P	**U**
Wt. of Tare & WS (gm)	28.15	27.42	27.54	**L**
Wt. of Tare & DS (gm)	24.13	23.64	23.94	**T**
Wt. of Tare (gm)	15.24	15.21	15.58	**I**
Wt. of Water (gm)	4.0	3.8	3.6	**P**
Wt. of DS (gm)	8.9	8.4	8.4	**O**
				I
Moisture Content (%)	**45.2**	**44.8**	**43.1**	**N**
Number of Blows	**18**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-K	A-L	
Wt. of Tare & WS (gm)	22.29	22.18	
Wt. of Tare & DS (gm)	20.44	20.25	
Wt. of Tare (gm)	15.55	15.52	
Wt. of Water (gm)	1.9	1.9	
Wt. of DS (gm)	4.9	4.7	
Moisture Content (%)	**37.8**	**40.8**	**-3.0**

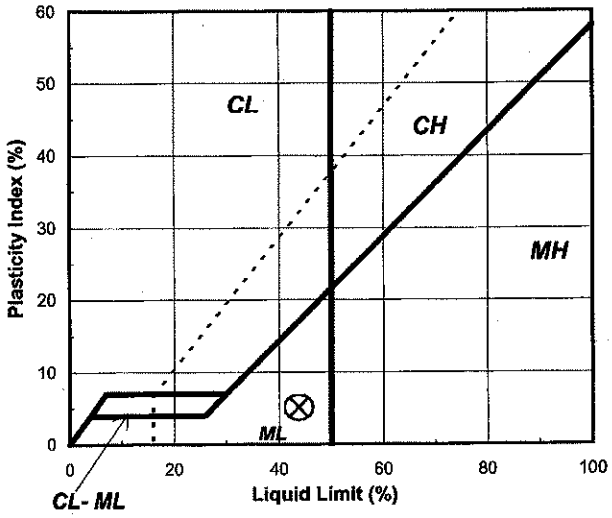
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**44**
Plastic Limit (%)	**39**
Plasticity Index (%)	**5**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 116K
Lab ID	2009-633-01-07	Soil Description	**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)

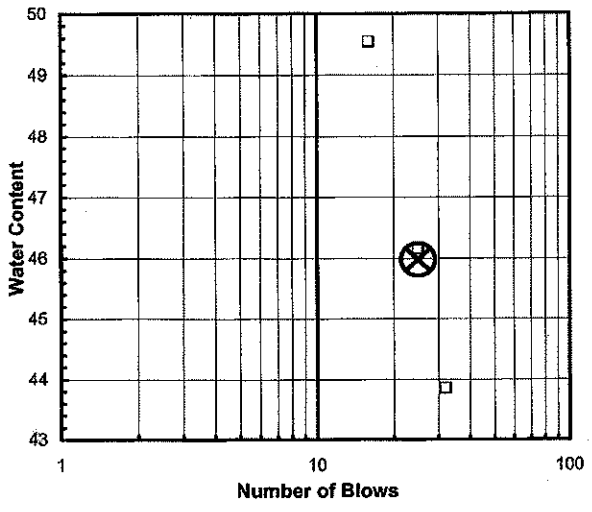
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-P	L	A-L	**U**
Wt. of Tare & WS (gm)	25.38	26.43	28.04	**L**
Wt. of Tare & DS (gm)	22.13	22.89	24.22	**T**
Wt. of Tare (gm)	15.57	15.22	15.51	**I**
Wt. of Water (gm)	3.3	3.5	3.8	**P**
Wt. of DS (gm)	6.6	7.7	8.7	**O**
				I
Moisture Content (%)	**49.5**	**46.2**	**43.9**	**N**
Number of Blows	**16**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	V	A-K	
Wt. of Tare & WS (gm)	22.22	22.26	
Wt. of Tare & DS (gm)	20.70	20.79	
Wt. of Tare (gm)	15.24	15.54	
Wt. of Water (gm)	1.5	1.5	
Wt. of DS (gm)	5.5	5.3	
Moisture Content (%)	**27.8**	**28.0**	**-0.2**

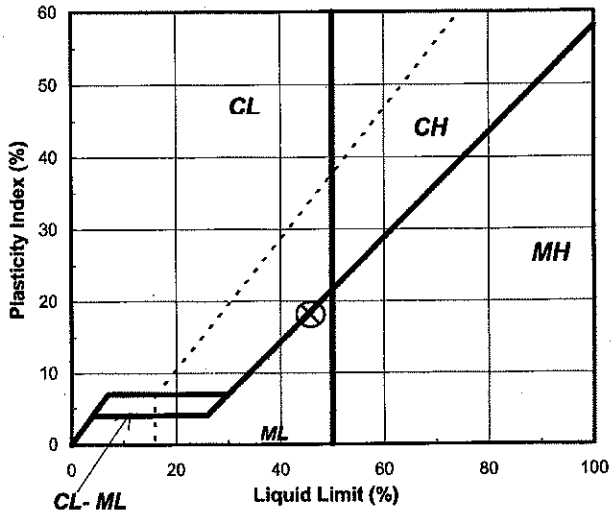
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**46**
Plastic Limit (%)	**28**
Plasticity Index (%)	**18**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 120K
Lab ID	2009-633-01-08	Soil Description	**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)

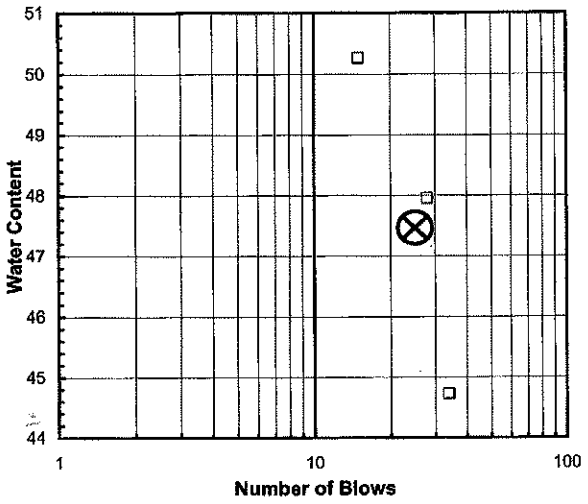
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	S	O	K	MULTIPOINT
Wt. of Tare & WS (gm)	26.72	27.47	26.76	
Wt. of Tare & DS (gm)	22.87	23.50	23.20	
Wt. of Tare (gm)	15.21	15.22	15.24	
Wt. of Water (gm)	3.9	4.0	3.6	
Wt. of DS (gm)	7.7	8.3	8.0	
Moisture Content (%)	**50.3**	**47.9**	**44.7**	
Number of Blows	**15**	**28**	**34**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	C	Q	
Wt. of Tare & WS (gm)	21.74	21.70	
Wt. of Tare & DS (gm)	19.82	19.70	
Wt. of Tare (gm)	15.24	15.16	
Wt. of Water (gm)	1.9	2.0	
Wt. of DS (gm)	4.6	4.5	
Moisture Content (%)	**41.9**	**44.1**	**-2.1**

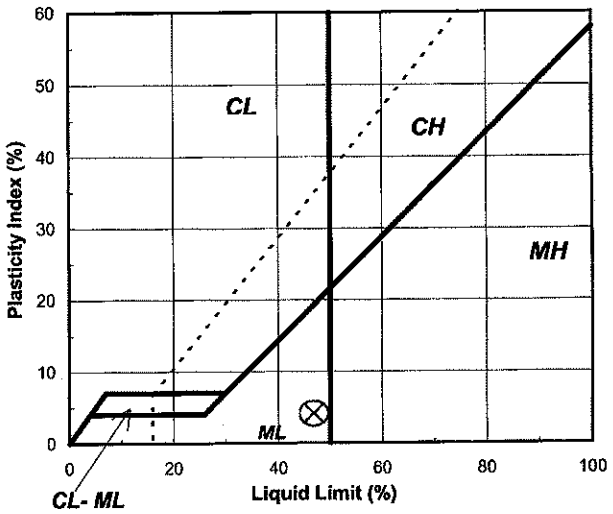
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**47**
Plastic Limit (%)	**43**
Plasticity Index (%)	**4**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 124K
Lab ID	2009-633-01-09	Soil Description	**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-H	M	B
Wt. of Tare & WS (gm)	28.91	26.86	28.60
Wt. of Tare & DS (gm)	24.48	23.23	24.60
Wt. of Tare (gm)	15.54	15.13	15.18
Wt. of Water (gm)	4.4	3.6	4.0
Wt. of DS (gm)	8.9	8.1	9.4
Moisture Content (%)	**49.6**	**44.9**	**42.5**
Number of Blows	**16**	**25**	**33**

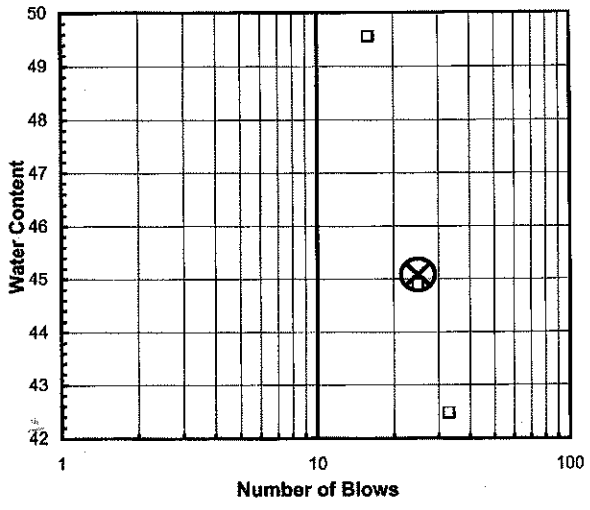
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	P	F	
Wt. of Tare & WS (gm)	22.03	22.84	
Wt. of Tare & DS (gm)	20.49	21.09	
Wt. of Tare (gm)	15.20	15.11	
Wt. of Water (gm)	1.5	1.8	
Wt. of DS (gm)	5.3	6.0	
Moisture Content (%)	**29.1**	**29.3**	**-0.2**

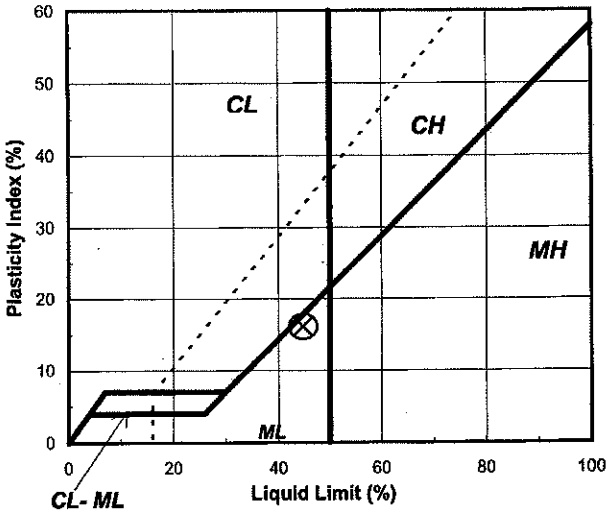
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**45**
Plastic Limit (%)	**29**
Plasticity Index (%)	**16**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 128K
Lab ID	2009-633-01-10	Soil Description	**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)

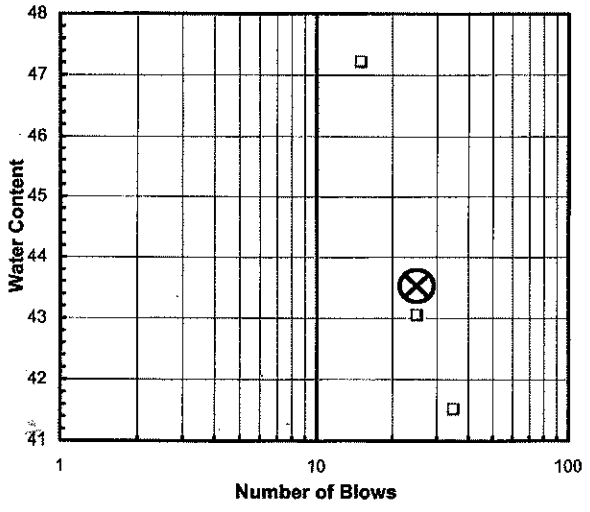
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	Q	C	K	**U**
Wt. of Tare & WS (gm)	28.38	28.20	25.93	**L**
Wt. of Tare & DS (gm)	24.14	24.30	22.80	**T**
Wt. of Tare (gm)	15.16	15.24	15.26	**I**
Wt. of Water (gm)	4.2	3.9	3.1	**P**
Wt. of DS (gm)	9.0	9.1	7.5	**O**
				I
Moisture Content (%)	**47.2**	**43.0**	**41.5**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	O	S	
Wt. of Tare & WS (gm)	21.84	22.55	
Wt. of Tare & DS (gm)	20.22	20.74	
Wt. of Tare (gm)	15.28	15.21	
Wt. of Water (gm)	1.6	1.8	
Wt. of DS (gm)	4.9	5.5	
Moisture Content (%)	**32.8**	**32.7**	**0.1**

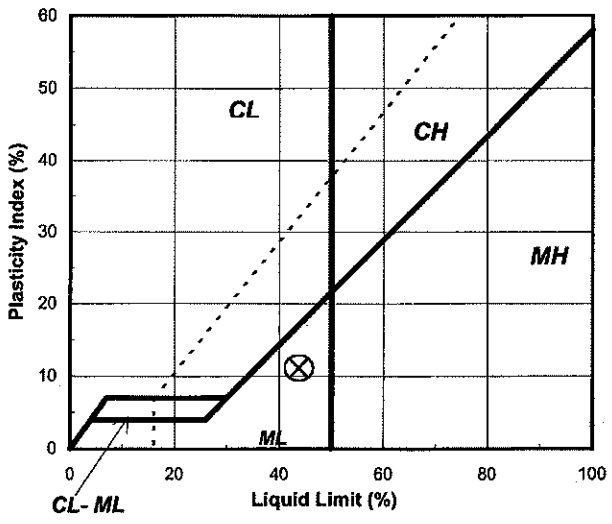
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**44**
Plastic Limit (%)	**33**
Plasticity Index (%)	**11**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 132K
Lab ID	2009-633-01-11	Soil Description	**ORANGE 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)

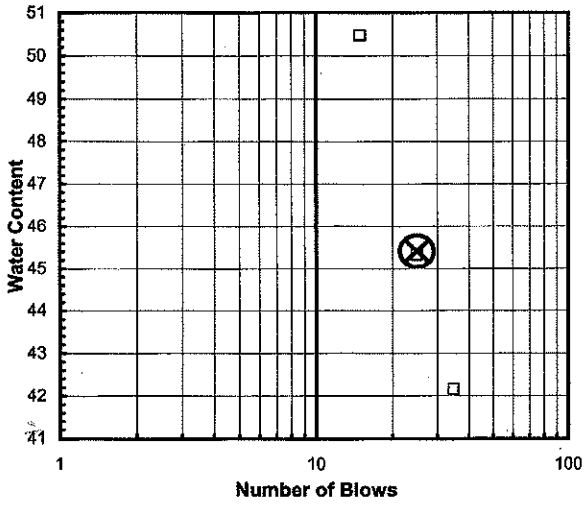
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	I	N	J	**U**
Wt. of Tare & WS (gm)	26.74	29.72	27.29	**L**
Wt. of Tare & DS (gm)	22.88	25.22	23.69	**T**
Wt. of Tare (gm)	15.23	15.29	15.15	**I**
Wt. of Water (gm)	3.9	4.5	3.6	**P**
Wt. of DS (gm)	7.7	9.9	8.5	**O**
				I
Moisture Content (%)	**50.5**	**45.3**	**42.2**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	U	Y	
Wt. of Tare & WS (gm)	21.40	21.89	
Wt. of Tare & DS (gm)	19.64	20.15	
Wt. of Tare (gm)	15.16	15.62	
Wt. of Water (gm)	1.8	1.7	
Wt. of DS (gm)	4.5	4.5	
Moisture Content (%)	**39.3**	**38.4**	**0.9**

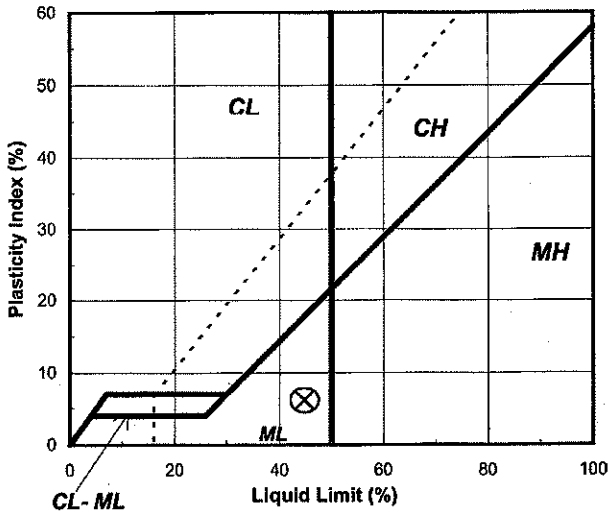
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**45**
Plastic Limit (%)	**39**
Plasticity Index (%)	**6**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 136K
Lab ID	2009-633-01-12	Soil Description	**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)

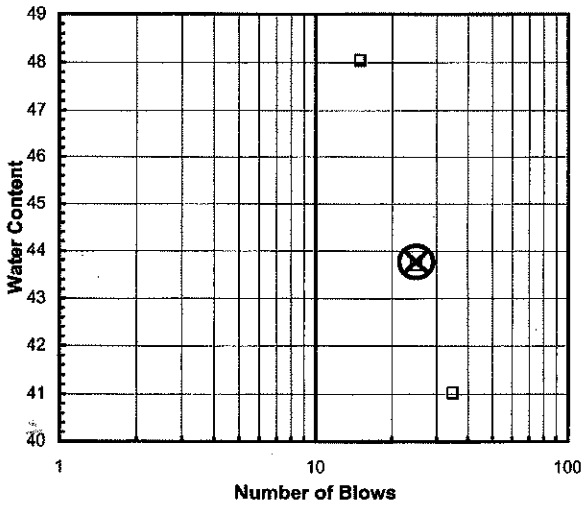
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-K	A-L	A-P	**U**
Wt. of Tare & WS (gm)	26.49	26.80	25.31	**L**
Wt. of Tare & DS (gm)	22.94	23.37	22.48	**T**
Wt. of Tare (gm)	15.55	15.52	15.58	**I**
Wt. of Water (gm)	3.6	3.4	2.8	**P**
Wt. of DS (gm)	7.4	7.9	6.9	**O**
				I
Moisture Content (%)	**48.0**	**43.7**	**41.0**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	L	V	
Wt. of Tare & WS (gm)	21.51	21.20	
Wt. of Tare & DS (gm)	20.01	19.81	
Wt. of Tare (gm)	15.27	15.30	
Wt. of Water (gm)	1.5	1.4	
Wt. of DS (gm)	4.7	4.5	
Moisture Content (%)	**31.6**	**30.8**	**0.8**

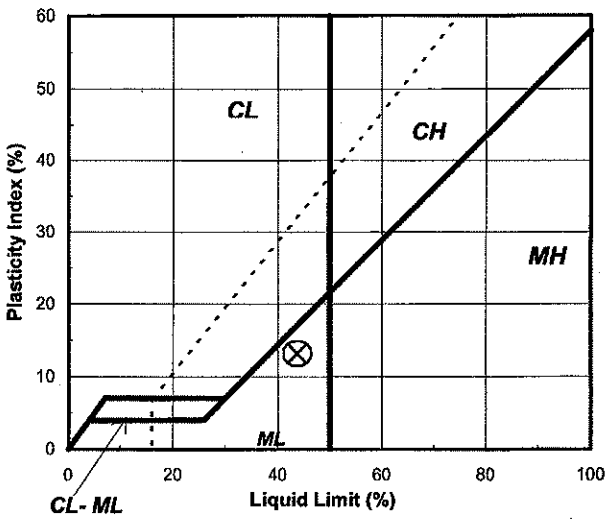
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**44**
Plastic Limit (%)	**31**
Plasticity Index (%)	**13**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 140K
Lab ID	2009-633-01-13	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)

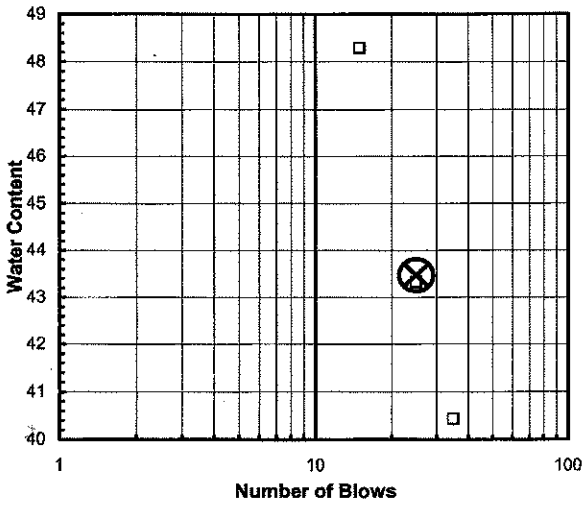
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	B	F	P	**U**
Wt. of Tare & WS (gm)	29.40	26.59	24.50	**L**
Wt. of Tare & DS (gm)	24.77	23.12	21.82	**T**
Wt. of Tare (gm)	15.18	15.11	15.19	**I**
Wt. of Water (gm)	4.6	3.5	2.7	**P**
Wt. of DS (gm)	9.6	8.0	6.6	**O**
				I
Moisture Content (%)	**48.3**	**43.3**	**40.4**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	M	A-H	
Wt. of Tare & WS (gm)	22.39	22.72	
Wt. of Tare & DS (gm)	20.33	20.67	
Wt. of Tare (gm)	15.12	15.53	
Wt. of Water (gm)	2.1	2.1	
Wt. of DS (gm)	5.2	5.1	
Moisture Content (%)	**39.5**	**39.9**	**-0.3**

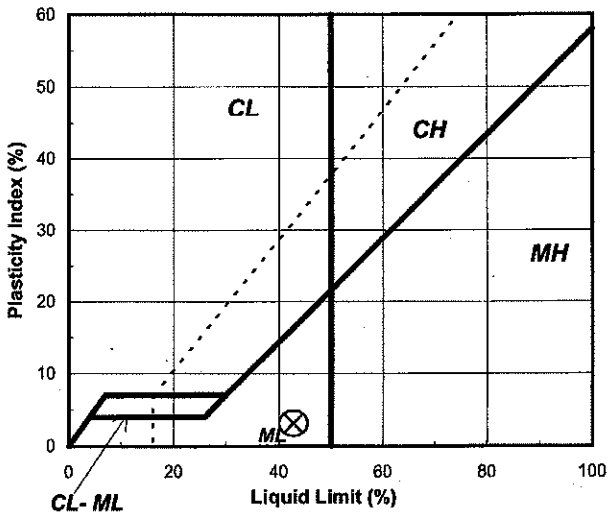
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**43**
Plastic Limit (%)	**40**
Plasticity Index (%)	**3**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	SP UNSCREENED
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 144K
Lab ID	2009-633-01-14	Soil Description	**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)

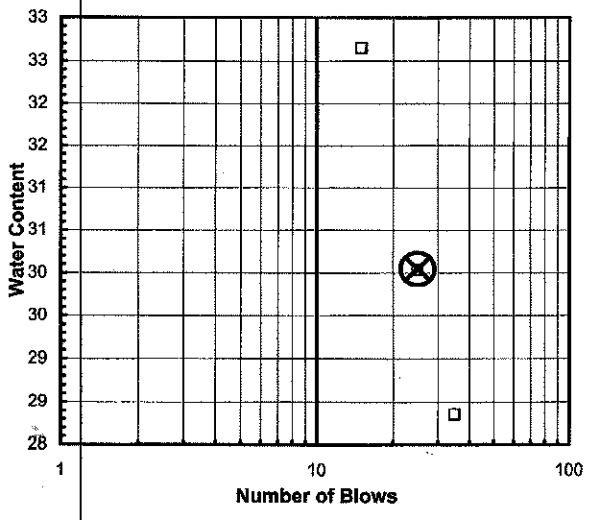
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	J	I	N	**U**
Wt. of Tare & WS (gm)	27.34	28.22	27.66	**L**
Wt. of Tare & DS (gm)	24.34	25.22	24.93	**T**
Wt. of Tare (gm)	15.15	15.23	15.30	**I**
Wt. of Water (gm)	3.0	3.0	2.7	**P**
Wt. of DS (gm)	9.2	10.0	9.6	**O**
				I
Moisture Content (%)	**32.6**	**30.0**	**28.3**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	Y	U	
Wt. of Tare & WS (gm)	23.75	21.73	
Wt. of Tare & DS (gm)	22.03	20.34	
Wt. of Tare (gm)	15.62	15.18	
Wt. of Water (gm)	1.7	1.4	
Wt. of DS (gm)	6.4	5.2	
Moisture Content (%)	**26.8**	**26.9**	**-0.1**

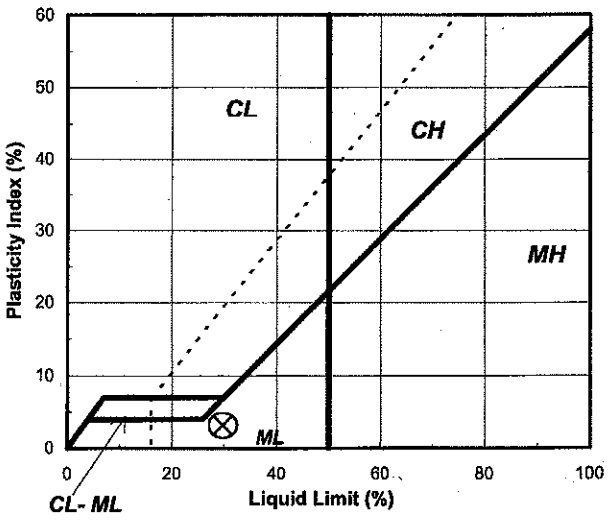
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**30**
Plastic Limit (%)	**27**
Plasticity Index (%)	**3**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	SP UNSCREENED
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	P.C. 148K
Lab ID	2009-633-01-15	Soil Description	**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)

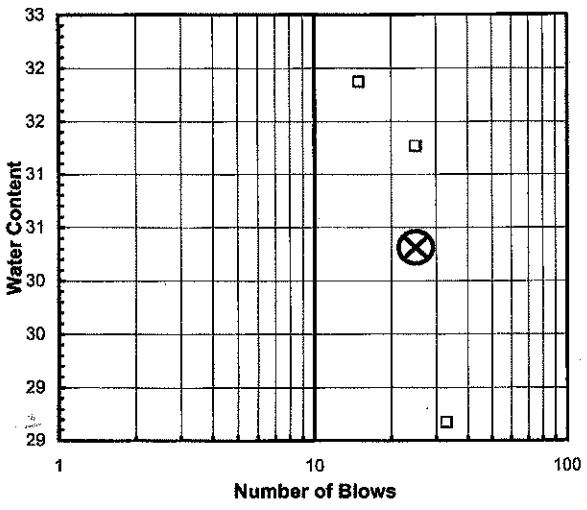
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	C	Q	K	**U**
Wt. of Tare & WS (gm)	29.02	29.30	30.59	**L**
Wt. of Tare & DS (gm)	25.69	25.93	27.17	**T**
Wt. of Tare (gm)	15.24	15.15	15.24	**I**
Wt. of Water (gm)	3.3	3.4	3.4	**P**
Wt. of DS (gm)	10.5	10.8	11.9	**O**
				I
Moisture Content (%)	**31.9**	**31.3**	**28.7**	**N**
Number of Blows	**15**	**25**	**33**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	O	S	
Wt. of Tare & WS (gm)	22.28	21.67	
Wt. of Tare & DS (gm)	20.75	20.29	
Wt. of Tare (gm)	15.20	15.21	
Wt. of Water (gm)	1.5	1.4	
Wt. of DS (gm)	5.6	5.1	
Moisture Content (%)	**27.6**	**27.2**	**0.4**

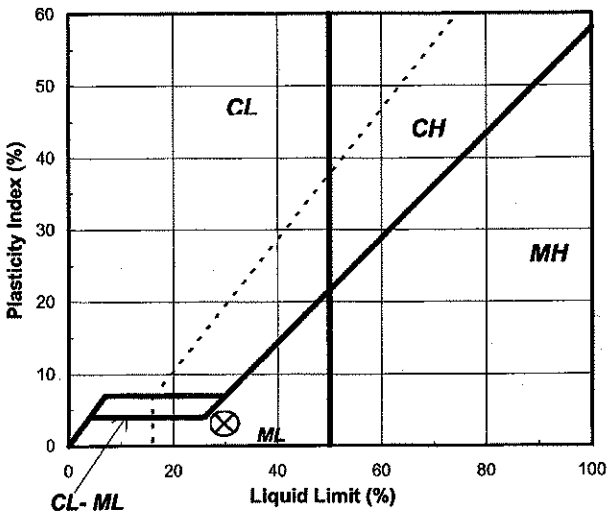
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**30**
Plastic Limit (%)	**27**
Plasticity Index (%)	**3**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By SD *Date* 3/6/2009 *Checked By* GEM *Date* 3-9-09

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2008-606-05

Lab ID	606-05-01	606-05-02	606-05-03
Boring No.	NA	NA	NA
Depth (ft)	NA	NA	NA
Sample No.	PC12K	PC16K	PC20K
Tare Number	212	201	209
Wt. of Tare & WS (gm)	836.62	843.57	931.16
Wt. of Tare & DS (gm)	755.54	763.92	809.45
Wt. of Tare (gm)	171.53	170.73	171.7
Wt. of Water (gm)	81.08	79.65	121.71
Wt. of DS (gm)	584.01	593.19	637.75
Water Content (%)	**13.9**	**13.4**	**19.1**

Notes : *NA*

Tested By JRB *Date* 8.28.08 *Checked By* JRB *Date* 8.28.08

DCN: GT-S1 DATE 6-30-98 REVISION: 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-05 WATCONT.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2008-606-07

Lab ID	606-07-01	606-07-02
Boring No.	NA	NA
Depth (ft)	NA	NA
Sample No.	PC24K	PC28K
Tare Number	202	397
Wt. of Tare & WS (gm)	670.58	809.58
Wt. of Tare & DS (gm)	606.17	729.31
Wt. of Tare (gm)	197.39	208.35
Wt. of Water (gm)	64.41	80.27
Wt. of DS (gm)	408.78	520.96
Water Content (%)	**15.8**	**15.4**

Notes : *NA*

Tested By JRB *Date* 8.29.08 *Checked By* JRB *Date* 8.29.08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO.MSW LF CLOSURE
Project No.	2008-606-08

Lab ID	.001	.002
Boring No.	NA	NA
Depth (ft)	NA	NA
Sample No.	PC32K	PC36K
Tare Number	317	319
Wt. of Tare & WS (gm)	716.1	790.66
Wt. of Tare & DS (gm)	692.25	760.05
Wt. of Tare (gm)	84.1	209.09
Wt. of Water (gm)	23.85	30.61
Wt. of DS (gm)	608.15	550.96
Water Content (%)	**3.9**	**5.6**

Notes : *NA*

Tested By SD *Date* 9/5/2008 *Checked By* GEM *Date* 9-11-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2 \\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08 WATCONT.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO. INC.
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2008-606-09

Lab ID	.001
Boring No.	NA
Depth (ft)	NA
Sample No.	PC-40K
Tare Number	215
Wt. of Tare & WS (gm)	805.49
Wt. of Tare & DS (gm)	712.81
Wt. of Tare (gm)	172.32
Wt. of Water (gm)	92.68
Wt. of DS (gm)	540.49
Water Content (%)	**17.1**

Notes : *NA*

Tested By SD *Date* 9/18/2008 *Checked By* GAM *Date* 9-22-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

\\Server\c\Data Sheets\[WATCONT.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO MSW LF CLOSURE
Project No.	2008-606-10

Lab ID	.001	.002	.003	.004	.005
Boring No.	1	2	3	4	5
Depth (ft)	NA	NA	NA	NA	NA
Sample No.	NA	NA	NA	NA	NA
Tare Number	214	820	211	215	208
Wt. of Tare & WS (gm)	761.87	816.8	748.34	802.8	842.5
Wt. of Tare & DS (gm)	584.73	690.53	699.4	681.23	726.98
Wt. of Tare (gm)	171.4	208.2	171.21	172.2	169.2
Wt. of Water (gm)	177.14	126.27	48.94	121.57	115.52
Wt. of DS (gm)	413.33	482.33	528.19	509.03	557.78
Water Content (%)	**42.9**	**26.2**	**9.3**	**23.9**	**20.7**

Lab ID	.006	.007	.008	.009	.010
Boring No.	6	7	8	9	10
Depth (ft)	NA	NA	NA	NA	NA
Sample No.	NA	NA	NA	NA	NA
Tare Number	201	210	213	217	397
Wt. of Tare & WS (gm)	754.01	885.72	821.24	768.18	824.82
Wt. of Tare & DS (gm)	647.93	772.58	634.88	628.5	732.57
Wt. of Tare (gm)	170.71	172.83	173.25	171.1	208.49
Wt. of Water (gm)	106.08	113.14	186.36	139.68	92.25
Wt. of DS (gm)	477.22	599.75	461.63	457.4	524.08
Water Content (%)	**22.2**	**18.9**	**40.4**	**30.5**	**17.6**

Notes : *NA*

Tested By JP *Date* 9/26/2008 *Checked By* GEM *Date* 10-6-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

\\Server\c\2008 INVOICES\OCT 2008\[TOTAL OCT 08 INVOICES.xls]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO MSW LF CLOSURE
Project No.	2008-606-10
	PG.2

Lab ID	.011	.012	.013	.014	.015
Boring No.	11	12	13	14	15
Depth (ft)	NA	NA	NA	NA	NA
Sample No.	NA	NA	NA	NA	NA
Tare Number	312	304	315	309	398
Wt. of Tare & WS (gm)	548.76	773.35	613.55	464.61	558.1
Wt. of Tare & DS (gm)	471.52	625.99	537.56	394.48	457.89
Wt. of Tare (gm)	84.2	110.71	110.41	109.54	84.27
Wt. of Water (gm)	77.24	147.36	75.99	70.13	100.21
Wt. of DS (gm)	387.32	515.28	427.15	284.94	373.62
Water Content (%)	**19.9**	**28.6**	**17.8**	**24.6**	**26.8**

Lab ID	.016	.017	.018
Boring No.	16	17	18
Depth (ft)	NA	NA	NA
Sample No.	NA	NA	NA
Tare Number	311	300	310
Wt. of Tare & WS (gm)	653.25	514.29	585.96
Wt. of Tare & DS (gm)	597.06	438.07	497.03
Wt. of Tare (gm)	84.22	110.87	110.26
Wt. of Water (gm)	56.19	76.22	88.93
Wt. of DS (gm)	512.84	327.2	386.77
Water Content (%)	**11.0**	**23.3**	**23.0**

Notes : *NA*

Tested By JP *Date* 9/26/2008 *Checked By* GEM *Date* 10-6-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

\\Server\c\2008 INVOICES\OCT 2008\[TOTAL OCT 08 INVOICES.xls]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	THALLE CONSTRUCTION CO., INC.
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2008-606-11

Lab ID	01	02	03	04	05
Boring No.	NA	NA	NA	NA	NA
Depth (ft)					
Sample No.	P.C. 92K	P.C. 96K	P.C. 100K	P.C. 104K	P.C. 108K
Tare Number	316	318	397	319	816
Wt. of Tare & WS (gm)	895.26	1025.8	1039.25	694.04	343.61
Wt. of Tare & DS (gm)	759.95	871.41	879.35	595.26	305.58
Wt. of Tare (gm)	208.21	207.68	208.38	209	136.11
Wt. of Water (gm)	135.31	154.39	159.9	98.78	38.03
Wt. of DS (gm)	551.74	663.73	670.97	386.26	169.47
Water Content (%)	**24.5**	**23.3**	**23.8**	**25.6**	**22.4**

Lab ID	06
Boring No.	NA
Depth (ft)	
Sample No.	V.C. 12K
Tare Number	817
Wt. of Tare & WS (gm)	330.78
Wt. of Tare & DS (gm)	300.43
Wt. of Tare (gm)	135.68
Wt. of Water (gm)	30.35
Wt. of DS (gm)	164.75
Water Content (%)	**18.4**

Notes : *NA*

Tested By SD *Date* 12/1/2008 *Checked By* TMS *Date* 12-2-08

DCN: CT-S1 DATE 6-30-98 REVISION: 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-11 WATCONT.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client GLOVER CONSTRUCTION
Client Reference
Project No.

Lab ID	.006	.007	.008	.009	.010
Boring No.	NA	NA	NA	NA	NA
Depth (ft)	NA	NA	NA	NA	NA
Sample No.	P.C. 112K	P.C. 116K	P.C. 120K	P.C. 124K	P.C. 128K
Tare Number	397	837	215	840	843
Wt. of Tare & WS (gm)	709.96	760.25	735.86	815.99	667.39
Wt. of Tare & DS (gm)	607.65	683.14	609.53	724.48	601.66
Wt. of Tare (gm)	208.45	260.66	172.39	262.61	262.22
Wt. of Water (gm)	102.31	77.11	126.33	91.51	65.73
Wt. of DS (gm)	399.2	422.48	437.14	461.87	339.44
Water Content (%)	**25.6**	**18.3**	**28.9**	**19.8**	**19.4**

Notes : *NA*

Tested By *SD* *Date* *10/24/2008* *Checked By* GBM *Date* 3-9-09

DCN: CT-S1 DATE 6-30-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\2009-633-01 WATCONT.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	GLOVER CONSTRUCTION
Client Reference	CAMP LEJEUNE LANDFILL
Project No.	2008-650-02

PG.2

Lab ID	.011	.012	.013	.014	.015
Boring No.	NA	NA	NA	NA	SP UNSCREENED
Depth (ft)	NA	NA	NA	NA	NA
Sample No.	P.C. 132K	P.C. 136K	P.C. 140K	P.C. 144K	P.C. 148K
Tare Number	210	213	214	G-15	820
Wt. of Tare & WS (gm)	650.40	902.26	649.41	1083.49	755.20
Wt. of Tare & DS (gm)	553.10	778.40	554.15	962.66	687.19
Wt. of Tare (gm)	172.85	173.16	171.21	151.29	209.30
Wt. of Water (gm)	97.3	123.86	95.26	120.83	68.01
Wt. of DS (gm)	380.25	605.24	382.94	811.37	477.89
Water Content (%)	**25.6**	**20.5**	**24.9**	**14.9**	**14.2**

Notes : *NA*

Tested By SD *Date* 3/6/2009 *Checked By* GBM *Date* 3-9-09

DCN: CT-S1 DATE 6-30-98 REVISION: 2

\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01 PG 2 WATCONT.XLS]Sheet1

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APPENDIX A-4

Field Compaction Reports

FIELD DENSITY TEST REPORT

Report Number: 70081052.0023
Service Date: 01/21/09
Report Date: 01/23/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0016	Red Micaceous Silty Sand	ASTM D698	18.5	102.1		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
1	20' North of South end, center fill	-15'	1	8"	118.9	20.6	21.0	98.3	96
2	30' North of South end, center area	-15'	1	8"	119.1	21.1	21.5	98.0	96

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: David M. Duffy
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0024
Service Date: 01/23/09
Report Date: 01/23/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0029	Strong Brown Silty Sand	ASTM D698	21.8	94.8		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
1	58' South of the northern most corner	-15'	1	6"	111.6	19.3	20.9	92.3	97
2	80' West of entrance driveway	-15'	1	6"	110.1	18.9	20.7	91.2	96

Datum: **Gauge ID:**
Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Patrick A. Sprague
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0027
Service Date: 01/26/09
Report Date: 01/26/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0016	One-Point	ASTM D698	23.5	90.3		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	Leachate basin backfill								
1	NE corner of site	-6'	1		110.6	22.8	26.0	87.8	97

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Thomas C. Sanders
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

LABORATORY COMPACTION CHARACTERISTICS OF SOIL

Report Number: 70081052.0029
Service Date: 01/26/09
Report Date: 01/29/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number 70081052

Material Information

Source of Material: On Site
Proposed Use: Backfill

Sample Information

Sample Date: 01/26/09
Sampled By: Thomas C. Sanders
Sample Location: Leachate Basin

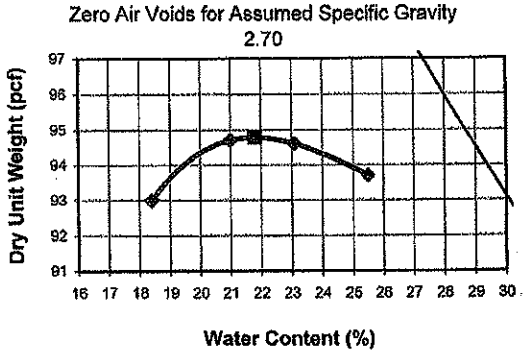
Sample Description: Strong Brown Silty Sand

Laboratory Test Data

Test Procedure: ASTM D698
Test Method: Method A
Sample Preparation: Dry
Rammer Type: Manual
Maximum Dry Unit Weight (pcf): 94.8
Optimum Water Content (%): 21.8

	Result	Specifications
Liquid Limit:	50	
Plastic Limit:	42	
Plasticity Index:	8	
In-Place Moisture (%):		
Passing #200 (%):	39.7	

USCS: SM



Comments:

Services:

Terracon Rep: Stephanie H. Cooley
Reported To:
Contractor:

Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods:

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SITE OBSERVATIONS REPORT

Report Number: 70081052.0033
Service Date: 01/29/09
Report Date: 01/29/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client
Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project
North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Weather: Sunny

Services Requested: Density testing

Location(s)/Elevation(s): Leachate Pond

Material Classification: Strong Brown Silty Sand

Equipment Used: Nuclear gauge

Lift Thickness: 1'

Project Specifications: 95% compaction

Results: Does not meet project specifications

Comments/Recommendations: It was recommended that the material be scarified, allowed to dry, and recompacted.

Terracon Rep.: David M. Duffy
Reported To:

Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0032
Service Date: 01/29/09
Report Date: 01/29/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0029	Strong Brown Silty Sand	ASTM D698	21.8	94.8		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
	Leachate pond									
1	10' East of west side, 40' north of south side	-13	1	8"	106.8	23.0	27.5	83.8	88	*
2	20' West of east side, 30' north of south side	-13	1	8"	108.8	24.4	28.9	84.4	89	*
3	30' East of west side, 40' south of north side	-14	1	8"	96.5	18.1	23.1	78.4	83	*
4	30' West of esat side, 40' south of north side	-14	1	8"	103.2	19.8	23.8	83.4	88	*
5	15' West of east side, 40' south of north side	-14	1	8"	102.3	24.1	30.8	78.2	82	*

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: David M. Duffy
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0034
Service Date: 01/30/09
Report Date: 02/03/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0029	Strong Brown Silty Sand	ASTM D698	21.8	94.8		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	Leachate pond								
1	10' East of west side, 40' north of south side	-13'	1	6"	117.5	20.8	21.5	96.7	100+
2	20' West of east side, 30' north of south side	-13'	1	6"	115.8	21.3	22.5	94.5	100
3	30' East of west side, 40' south of north side	-14'	1	6"	116.4	22.8	24.4	93.6	99
4	30' West of east side, 40' south of north side	-14'	1	6"	115.7	20.4	21.4	95.3	100+
5	15' West of east side, 40' south of north side	-14'	1	6"	109.3	17.3	18.8	92.0	97

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Anjon S. De
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0036
Service Date: 02/05/09
Report Date: 02/06/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0022	Strong Brown Micaceous Sandy Silt	ASTM D698	18.5	102.1		Min 95
2	70081052.0029	Strong Brown Silty Sand	ASTM D698	13.0	117.8		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
	Leachate pond									
1	150' east 50' north of SWcorner	-1'	1	6"	109.0	26.7	32.5	82.3	81	*
2	50' west 75' south of NE corner	-1'	1	6"	117.6	26.7	29.4	90.9	89	*
3	50' south 100' east of NW corner	SG	2	6"	116.0	23.0	24.7	93.0	79	*
4	50' north 100' east of SW corner	SG	2	6"	109.5	17.9	19.5	91.6	78	*

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Anjon S. De
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0039
Service Date: 02/13/09
Report Date: 02/13/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0009	Brown Silty Sand	ASTM D698	13.0	117.8		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	Leachate pond								
1	150' east 50' north of SW corner	-1'	1	6"	130.7	17.5	15.5	113.2	96
2	50' west 75' south of NE corner	-1'	1	6"	130.5	16.7	14.7	113.8	97
3	50' south 100' east of NW corner	SG	1	6"	128.7	16.7	14.9	112.0	95
4	50' south 100' east of NW corner	SG	1	6"	129.0	15.8	14.0	113.2	96
5	150' west 100' south of NE corner	SG	1	6"	132.4	17.5	15.2	114.9	98

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Anjon S. De
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0049
Service Date: 04/10/09
Report Date: 04/13/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92
2	70081052.0040	Strong Brown Micaceous Silty Sand	ASTM D698	18.0	105.6		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
	SW slope									
1	North end	SG	1	6"	118.0	30.1	34.3	87.9	96	
2	North end	SG	1	6"	118.2	26.3	28.6	91.9	100	
3	Middle	SG	1	6"	126.0	33.5	36.2	92.5	100+	
4	South end	SG	1	6"	105.3	19.4	22.6	85.9	93	
5	South end	SG	1	6"	109.5	20.9	23.6	88.6	96	
6	Middle	SG	1	6"	107.9	23.9	28.5	84.0	91	*
	Crown									
7	NW corner	SG	1	6"	110.5	22.7	25.9	87.8	96	
8	SW corner	SG	1	6"	123.7	23.9	23.9	99.8	100+	
9	East corner	SG	1	6"	109.2	20.7	23.4	88.5	96	
10	SE corner	SG	1	6"	90.8	17.6	24.1	73.2	80	*
	Leachate pond									
11	West	SG	2	6"	120.1	21.6	21.9	98.5	93	*
12	West	SG	2	6"	126.2	14.1	12.6	112.1	100+	
13	West	SG	2	6"	124.9	15.2	13.9	109.7	100+	
14	West	SG	2	6"	121.8	22.1	22.2	99.7	94	*

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Patrick A. Sprague
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0052
Service Date: 04/17/09
Report Date: 04/17/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92
2	70081052.0040	Strong Brown Micaceous Silty Sand	ASTM D698	18.0	105.6		Min 92
3	70081052.0054	Strong Brown Sandy Silt	ASTM D698	18.5	98.7		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
1	Retest of #6 from 4-10-09	SG	1	6"	108.8	20.7	23.5	88.1	96	
2	SE corner	SG	3	6"	95.7	14.9	18.4	80.8	82	*
3	Middle	SG	2	6"	125.1	19.9	18.9	105.2	100	
4	NW corner	SG	1	6"	112.3	17.6	18.6	94.7	100+	
5	Retest of #11 from 4-10-09	SG	2	6"	117.2	21.8	22.9	95.4	90	*
6	Retest of #14 from 4-10-09	SG	2	6"	125.3	19.7	18.7	105.6	100	

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Scott M. Rist
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0055
Service Date: 04/23/09
Report Date: 04/23/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0054	Strong Brown Silty Sand	ASTM D698	18.5	98.7		Min 92
2	70081052.0040	Strong Brown Micaceous Silty Sand	ASTM D698	18.0	105.6		Min 92
3	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
1	SE corner	SG	1	6"	97.8	13.5	16.0	84.3	85	*
2	Retest #11 from 4-10-09	SG	2	6"	132.0	19.2	17.0	112.8	100+	
3	100' south of Sampling Street	SG	3	6"	110.9	21.5	24.1	89.4	97	
4	10' north of Sampling Street	-5'	2	6"	125.0	22.1	21.5	102.9	97	
5	60' north of Sampling Street	-5'	2	6"	126.6	21.2	20.1	105.4	100	
6	120' north of Sampling Street	-5'	2	6"	126.5	23.1	22.3	103.4	98	
7	Retest of #1	SG	1	6"	103.5	15.1	17.1	88.4	90	*

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Lowell D. Fletcher
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0001
Service Date: 08/08/08
Report Date: 08/13/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0004	Reddish Brown Micaceous Silty Sand	ASTM D698	15.5	110.3		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
1	10' N, 12' E of Survey Point # 1178	S/G	1	6	121.2	13.2	12.2	108.0	98	
2	10' N, 30 E of Survey Point # 1178	S/G	1	6	109.2	14.9	15.8	94.3	85	*

Datum: **Gauge ID:** 18563 **Std. Cnt. M:** 710 **Std. Cnt. D:** 2261

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services: Perform in-place density and moisture content tests to determine degree of compaction and material moisture condition.
Terracon Rep.: Scott M. Rist
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods:

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SITE OBSERVATIONS REPORT

Report Number: 70081052.0006
Service Date: 08/12/08
Report Date: 08/13/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client
Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project
North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Weather: Sunny

Services Requested: Density testing

Services Requested By: Wake County Facilities Design Construction

Location(s)/Elevation(s): East side of landfill

Material Classification: Brown/red brown silty sand

Equipment Used: Nuclear gauge

Lift Thickness: 1'

Project Specifications: 95% compaction

Results: Meets project specifications

Comments/Recommendations: Recommended adding moisture and re-compacting drier surface areas prior to liner application.

Terracon Rep.: Anjon S. De
Reported To: Frank with CDM

Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0005
Service Date: 08/12/08
Report Date: 08/13/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0004	Reddish Brown Micaceous Silty Sand	ASTM D698	15.5	110.3		Min 95
2	70081052.0003	Brown Micaceous Silty Sand	ASTM D698	12.4	121.4		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	NE corner of Phase 2								
1	200' South and 200' West	SG	1	6"	119.5	14.7	14.0	104.8	95
2	300' South and 200' West	SG	1	6"	119.1	13.7	13.0	105.4	96
3	200' South and 250' West	SG	1	6"	127.9	15.7	14.0	112.2	100+
4	300' South and 250' West	SG	2	6"	136.3	14.6	12.0	121.7	100

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Anjon S. De
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0014
Service Date: 09/24/08
Report Date: 09/25/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0011	Reddish Brown Micaceous Silty Sand	ASTM D698	15.5	110.3		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	West slope								
1	Roadway 100' from top	SG	1	6"	129.7	19.6	17.8	110.1	100
2	Roadway 150' from top	SG	1	6"	128.8	19.7	18.1	109.1	99
3	Slope 125' from top 40' north of road	SG	1	6"	126.9	19.5	18.2	107.4	97

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Anjon S. De
Reported To: Farouk Banna
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SITE OBSERVATIONS REPORT

Report Number: 70081052.0018
Service Date: 10/04/08
Report Date: 10/06/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client
Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project
North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Weather: Clear

Services Requested: Density testing

Location(s)/Elevation(s): West side of access road

Equipment Used: Nuclear gauge

Lift Thickness: 6"

Project Specifications: 95% compaction

Results: Meets project specifications

Comments/Recommendations: None

Terracon Rep.: David M. Duffy
Reported To:

Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0017
Service Date: 10/04/08
Report Date: 10/06/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0016	Red Micaceous Silty Sand	ASTM D698	18.5	102.1		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	Access Road								
1	450' top of road	FG	1	6"	121.9	19.8	19.4	102.1	100
2	550' top of road	FG	1	6"	123.2	20.3	19.7	102.9	100+

Datum: **Gauge ID:**

Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: David M. Duffy
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SITE OBSERVATIONS REPORT

Report Number: 70081052.0008
Service Date: 08/21/08
Report Date: 08/26/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client
Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project
North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Weather: Clear

Services Requested: Density testing

Services Requested By: Farouk with CDM

Location(s)/Elevation(s): Test Pad, East slope

Material Classification: Brown silty sand

Equipment Used: Nuclear gauge

Lift Thickness: 18" bridge lift

Project Specifications: 92% compaction with D6 Dozer tracking in only

Results: Meets project specifications

Comments/Recommendations: None

Terracon Rep.: Trevor M. Buck
Reported To:

Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: James A. Ezzell
Project Manager

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SITE OBSERVATIONS REPORT

Report Number: 70081052.0008
Service Date: 08/21/08
Report Date: 08/26/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client
Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project
North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Weather: Clear

Services Requested: Density testing

Services Requested By: Farouk with CDM

Location(s)/Elevation(s): Test Pad, East slope

Material Classification: Brown silty sand

Equipment Used: Nuclear gauge

Lift Thickness: 18" bridge lift

Project Specifications: 92% compaction with D6 Dozer tracking in only

Results: Meets project specifications

Comments/Recommendations: None

Terracon Rep.: Trevor M. Buck
Reported To:

Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0007
Service Date: 08/21/08
Report Date: 08/26/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0009	Brown Silty Sand	ASTM D698	13.0	117.8		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	Test Pad								
1	60' up East slope	SG	1	6"	129.4	18.4	16.6	111.0	94
2	75' up East slope	SG	1	6"	132.7	19.2	16.9	113.5	96
3	125' up East slope	SG	1	6"	130.1	20.4	18.6	109.7	93

Datum: **Gauge ID:**
Comments:

Services:
Terracon Rep.: Trevor M. Buck
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0007
Service Date: 08/21/08
Report Date: 08/26/08

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0009	Brown Silty Sand	ASTM D698	13.0	117.8		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
	Test Pad								
1	60' up East slope	SG	1	6"	129.4	18.4	16.6	111.0	94
2	75' up East slope	SG	1	6"	132.7	19.2	16.9	113.5	96
3	125' up East slope	SG	1	6"	130.1	20.4	18.6	109.7	93

Datum: **Gauge ID:**

Comments:

Services:
Terracon Rep.: Trevor M. Buck
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
James A. Ezzell
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0043
Service Date: 03/25/09
Report Date: 03/26/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
	Top of hill									
1	North side	SG	1	6"	104.9	15.2	16.9	89.7	98	
2	North side	SG	1	6"	108.6	14.4	15.3	94.2	100+	
3	Middle	SG	1	6"	105.3	14.9	16.5	90.4	98	
4	Middle	SG	1	6"	94.1	11.6	14.0	82.5	90	*
5	South side	SG	1	6"	95.2	11.8	14.2	83.4	91	*
6	South side	SG	1	6"	110.4	17.0	18.2	93.4	100+	

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Patrick A. Sprague
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0049
Service Date: 04/10/09
Report Date: 04/13/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92
~~2~~	~~70081052.0040~~	~~Strong Brown Micaceous Silty Sand~~	~~ASTM D698~~	~~18.0~~	~~105.6~~		~~Min 95~~

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
	SW slope									
1	North end	SG	1	6"	118.0	30.1	34.3	87.9	96	
2	North end	SG	1	6"	118.2	26.3	28.6	91.9	100	
3	Middle	SG	1	6"	126.0	33.5	36.2	92.5	100+	
4	South end	SG	1	6"	105.3	19.4	22.6	85.9	93	
5	South end	SG	1	6"	109.5	20.9	23.6	88.6	96	
6	Middle	SG	1	6"	107.9	23.9	28.5	84.0	91	*
	Crown									
7	NW corner	SG	1	6"	110.5	22.7	25.9	87.8	96	
8	SW corner	SG	1	6"	123.7	23.9	23.9	99.8	100+	
9	East corner	SG	1	6"	109.2	20.7	23.4	88.5	96	
10	SE corner	SG	1	6"	90.8	17.6	24.1	73.2	80	*
	~~Leachate pond~~									
11	West	SG	2	6"	120.1	21.6	21.9	98.5	~~93~~	*
12	West	SG	2	6"	~~126.2~~	~~14.1~~	12.6	112.1	100+	
13	West	SG	2	6"	124.9	15.2	13.9	109.7	100+	
~~14~~	West	SG	2	6"	121.8	22.1	22.2	~~99.7~~	94	*

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Patrick A. Sprague
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0052
Service Date: 04/17/09
Report Date: 04/17/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92
2	70081052.0040	Strong Brown Micaceous Silty Sand	ASTM D698	18.0	105.6		Min 92
3	70081052.0054	Strong Brown Sandy Silt	ASTM D698	18.5	98.7		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
1	Retest of #6 from 4-10-09	SG	1	6"	108.8	20.7	23.5	88.1	96	
2	SE corner	SG	3	6"	95.7	14.9	18.4	80.8	82	*
3	Middle	SG	2	6"	125.1	19.9	18.9	105.2	100	
4	NW corner	SG	1	6"	112.3	17.6	18.6	94.7	100+	
5	Retest of #11 from 4-10-09	SG	2	6"	117.2	21.8	22.9	95.4	90	*
6	Retest of #14 from 4-10-09	SG	2	6"	125.3	19.7	18.7	105.6	100	

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Scott M. Rist
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0055
Service Date: 04/23/09
Report Date: 04/23/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0054	Strong Brown Silty Sand	ASTM D698	18.5	98.7		Min 92
2	70081052.0040	Strong Brown Micaceous Silty Sand	ASTM D698	18.0	105.6		Min 92
3	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 92

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)	
1	SE corner	SG	1	6"	97.8	13.5	16.0	84.3	85	*
2	Retest #11 from 4-10-09	SG	2	6"	132.0	19.2	17.0	112.8	100+	
3	100' south of Sampling Street	SG	3	6"	110.9	21.5	24.1	89.4	97	
4	10' north of Sampling Street	-5'	2	6"	125.0	22.1	21.5	102.9	97	
5	60' north of Sampling Street	-5'	2	6"	126.6	21.2	20.1	105.4	100	
6	120' north of Sampling Street	-5'	2	6"	126.5	23.1	22.3	103.4	98	
7	Retest of #1	SG	1	6"	103.5	15.1	17.1	88.4	90	*

Datum: **Gauge ID:**

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Lowell D. Fletcher
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By: J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

FIELD DENSITY TEST REPORT

Report Number: 70081052.0057
Service Date: 05/14/09
Report Date: 05/15/09

Terracon
5240 Green's Dairy Road
Raleigh, NC 27616
919-873-2211

Client

Wake County Facilities Design & Construction
Attn: John Roberson
P.O. Box 550
Raleigh, NC 27602

Project

North Wake Landfill Closure
Durant Road
Raleigh, NC

Project Number: 70081052

Material Information

Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Lab Test Data: Optimum Water Content (%)	Lab Test Data: Max. Lab Dry Unit Weight (pcf)	Project Requirements: Water Content (%)	Project Requirements: Minimum Compaction (%)
1	70081052.0047	Yellowish Brown Silty Sand	ASTM D698	24.3	91.9		Min 95
2	70081052.0054	Strong Brown Silty Sand	ASTM D698	18.5	98.7		Min 95
3	70081052.0011	Reddish Brown Micaceous Silty Sand	ASTM D698	15.5	110.3		Min 95
4	70081052.0009	Brown Silty Sand	ASTM D698	13.0	117.8		Min 95
5	70081052.0003	Brown Micaceous Silty Sand	ASTM D698	12.4	121.4		Min 95

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Compaction (%)
1	Cul-de-sac	SG	1	6"	112.0	21.2	23.3	90.8	99
2	Cul-de-sac	SG	1	6"	116.0	20.5	21.5	95.5	100+
3	Cul-de-sac	SG	2	6"	118.2	21.1	21.7	97.1	98
4	5' in from top of road	SG	2	6"	116.6	18.1	18.4	98.5	100
5	105' in from top of road	SG	2	6"	125.7	16.3	14.9	109.4	100+
6	205' in from top of road	SG	3	6"	132.0	18.2	16.0	113.8	100+
7	305' in from top of road	SG	4	6"	134.5	15.4	12.9	119.1	100+
8	405' in from top of road	SG	5	6"	135.7	17.6	14.9	118.1	97
9	505' in from top of road	SG	5	6"	136.3	17.8	15.0	118.5	98
10	605' in from top of road	SG	5	6"	136.4	17.5	14.7	118.9	98
11	705' in from top of road	SG	5	6"	136.1	17.4	14.7	118.7	98

Datum: **Gauge ID:**
Comments: **Test results on this report meet project requirements as noted above.**

Services:
Terracon Rep.: Lowell D. Fletcher
Reported To:
Contractor:
Report Distribution:
(1) Wake County Facilities Design & Construction

Reviewed By:
J. Aaron Ezzell, PG
Project Manager

Test Methods: ASTM D6938

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

APPENDIX A-5

Vegetative Cover Conformance Testing

Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO.,INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	VC4K
Lab ID	2008-606-08-03	Soil Color	**DARK BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**

USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By SD Date 9/5/2008 Checked By GEM Date 9-11-08

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-03 J-SIEVEON.xls]Sheet1*

2200 Westinghouse Boulevard • Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460

Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO.,INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	VC4K
Lab ID	2008-606-08-03	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	397	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	791.62	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	740.59	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	208.27	Weight of Tare (gm)	22.03
Weight of Water (gm)	51.03	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	532.32	Weight of Dry Soil (gm)	22.47
Moisture Content (%)	**9.6**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	17952.6	Weight of the Dry Specimen (gm)	532.32
Dry Weight - 3/4" Sample (gm)	16382.2	Weight of minus #200 material (gm)	234.67
Wet Weight +3/4" Sample (gm)	1138.10	Weight of plus #200 material (gm)	297.65
Dry Weight + 3/4" Sample (gm)	1138.10		
Total Dry Weight Sample (gm)	17520.3	**J - Factor (Percent Finer than 3/4")**	**0.9350**

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	325.10		1.9	1.9	98.1	**98.1**
1"	25	532.40		3.0	4.9	95.1	**95.1**
3/4"	19	280.60		1.6	6.5	93.5	**93.5**
1/2"	12.5	0.00		0.0	0.0	100.0	**93.5**
3/8"	9.5	2.14		0.4	0.4	99.6	**93.1**
#4	4.75	13.97		2.6	3.0	97.0	**90.7**
#10	2	22.91		4.3	7.3	92.7	**86.7**
#20	0.85	41.68	(**)	7.8	15.2	84.8	**79.3**
#40	0.425	54.66		10.3	25.4	74.6	**69.7**
#60	0.25	54.55		10.2	35.7	64.3	**60.1**
#140	0.106	85.04		16.0	51.7	48.3	**45.2**
#200	0.075	22.70		4.3	55.9	44.1	**41.2**
Pan	-	234.67		44.1	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By SD Date 9/5/2008 Checked By GEN Date 9-11-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-03 J-SIEVEON.xls]Sheet1

2200 Westinghouse Boulevard • Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460

Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO.,INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	VC8K
Lab ID	2008-606-08-04	Soil Color	**DARK BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By SD Date 9/5/2008 Checked By GEM Date 9-11-08

DCN: CT-S3A DATE 6-25-98 REVISION 2

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-04 J-SIEVEON.xls]Sheet1

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO.,INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	VC8K
Lab ID	2008-606-08-04	Soil Color	**DARK BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	316	Tare No.	K-1
Wgt.Tare + Wet Specimen (gm)	837.15	Wgt.Tare + Wet Specimen (gm)	44.50
Wgt.Tare + Dry Specimen (gm)	736.58	Wgt.Tare + Dry Specimen (gm)	44.50
Weight of Tare (gm)	208.10	Weight of Tare (gm)	22.03
Weight of Water (gm)	100.57	Weight of Water (gm)	0.00
Weight of Dry Soil (gm)	528.48	Weight of Dry Soil (gm)	22.47
Moisture Content (%)	**19.0**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	18809.1	Weight of the Dry Specimen (gm)	528.48
Dry Weight - 3/4" Sample (gm)	15802.0	Weight of minus #200 material (gm)	203.85
Wet Weight +3/4" Sample (gm)	262.00	Weight of plus #200 material (gm)	324.63
Dry Weight + 3/4" Sample (gm)	262.00		
Total Dry Weight Sample (gm)	16064.0	**J - Factor (Percent Finer than 3/4")**	**0.9837**

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	114.90		0.7	0.7	99.3	**99.3**
3/4"	19	147.10		0.9	1.6	98.4	**98.4**
1/2"	12.5	20.71		3.9	3.9	96.1	**94.5**
3/8"	9.5	3.65		0.7	4.6	95.4	**93.8**
#4	4.75	14.31		2.7	7.3	92.7	**91.2**
#10	2	25.36		4.8	12.1	87.9	**86.5**
#20	0.85	48.28	(**)	9.1	21.3	78.7	**77.5**
#40	0.425	58.77		11.1	32.4	67.6	**66.5**
#60	0.25	52.96		10.0	42.4	57.6	**56.7**
#140	0.106	78.26		14.8	57.2	42.8	**42.1**
#200	0.075	22.33		4.2	61.4	38.6	**37.9**
Pan	-	203.85		38.6	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By SD Date 9/5/2008 Checked By GEM Date 9-11-08

DCN: CT-S3A DATE 5-17-00 REVISION 3

\\Server\c\2008 PROJECTS\2008-606 THALLE\[2008-606-08-04 J-SIEVEON.xls]Sheet1

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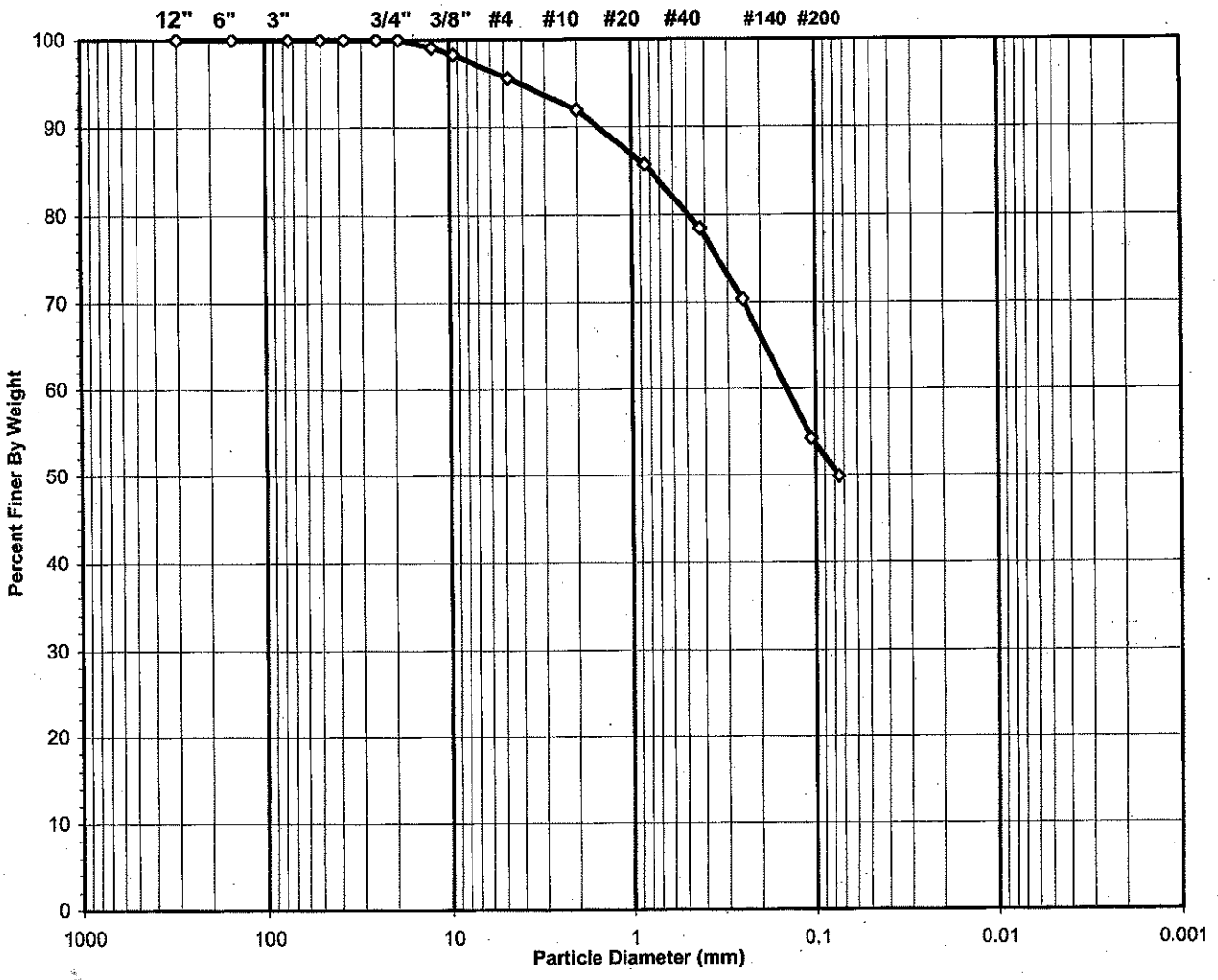
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRCUTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	V.C. 12K
Lab ID	2008-606-11-06	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By JP Date 12/2/2008 Checked By TMS Date 12-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRCUTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	V.C. 12K
Lab ID	2008-606-11-06	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	217	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	1088.22	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	927.61	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.10	Weight of Tare (gm)	NA
Weight of Water (gm)	160.61	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	756.51	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**21.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	756.51
Dry Weight - 3/4" Sample (gm)	379.7	Weight of minus #200 material (gm)	376.85
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	379.66
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	7.11	0.9	0.9	99.1	**99.1**
3/8"	9.50	6.08	0.8	1.7	98.3	**98.3**
#4	4.75	20.66	2.7	4.5	95.5	**95.5**
#10	2.00	27.49	3.6	8.1	91.9	**91.9**
#20	0.850	47.10	6.2	14.3	85.7	**85.7**
#40	0.425	54.40	7.2	21.5	78.5	**78.5**
#60	0.250	61.75	8.2	29.7	70.3	**70.3**
#140	0.106	121.39	16.0	45.7	54.3	**54.3**
#200	0.075	33.68	4.5	50.2	49.8	**49.8**
Pan	-	376.85	49.8	100.0	-	-

Tested By JP Date 12/2/2008 Checked By TMS Date 12-3-08

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	V.C. 20K
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-13	Sample No.	NA
Lab ID	2008-606-13-01	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By SD Date 12/31/2009 Checked By GEM Date 1-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	V.C. 20K
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-13	Sample No.	NA
Lab ID	2008-606-13-01	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	835	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	708.94	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	634.84	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	254.01	Weight of Tare (gm)	NA
Weight of Water (gm)	74.10	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	380.83	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.5**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	380.83
Dry Weight - 3/4" Sample (gm)	242.4	Weight of minus #200 material (gm)	138.45
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	242.38
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	5.68	1.5	1.5	98.5	**98.5**
#4	4.75	9.41	2.5	4.0	96.0	**96.0**
#10	2.00	19.08	5.0	9.0	91.0	**91.0**
#20	0.850	37.02	9.7	18.7	81.3	**81.3**
#40	0.425	51.31	13.5	32.2	67.8	**67.8**
#60	0.250	52.18	13.7	45.9	54.1	**54.1**
#140	0.106	58.62	15.4	61.3	38.7	**38.7**
#200	0.075	9.08	2.4	63.6	36.4	**36.4**
Pan	-	138.45	36.4	100.0	-	-

Tested By SD Date 12/31/2009 Checked By Gem Date 1-5-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2

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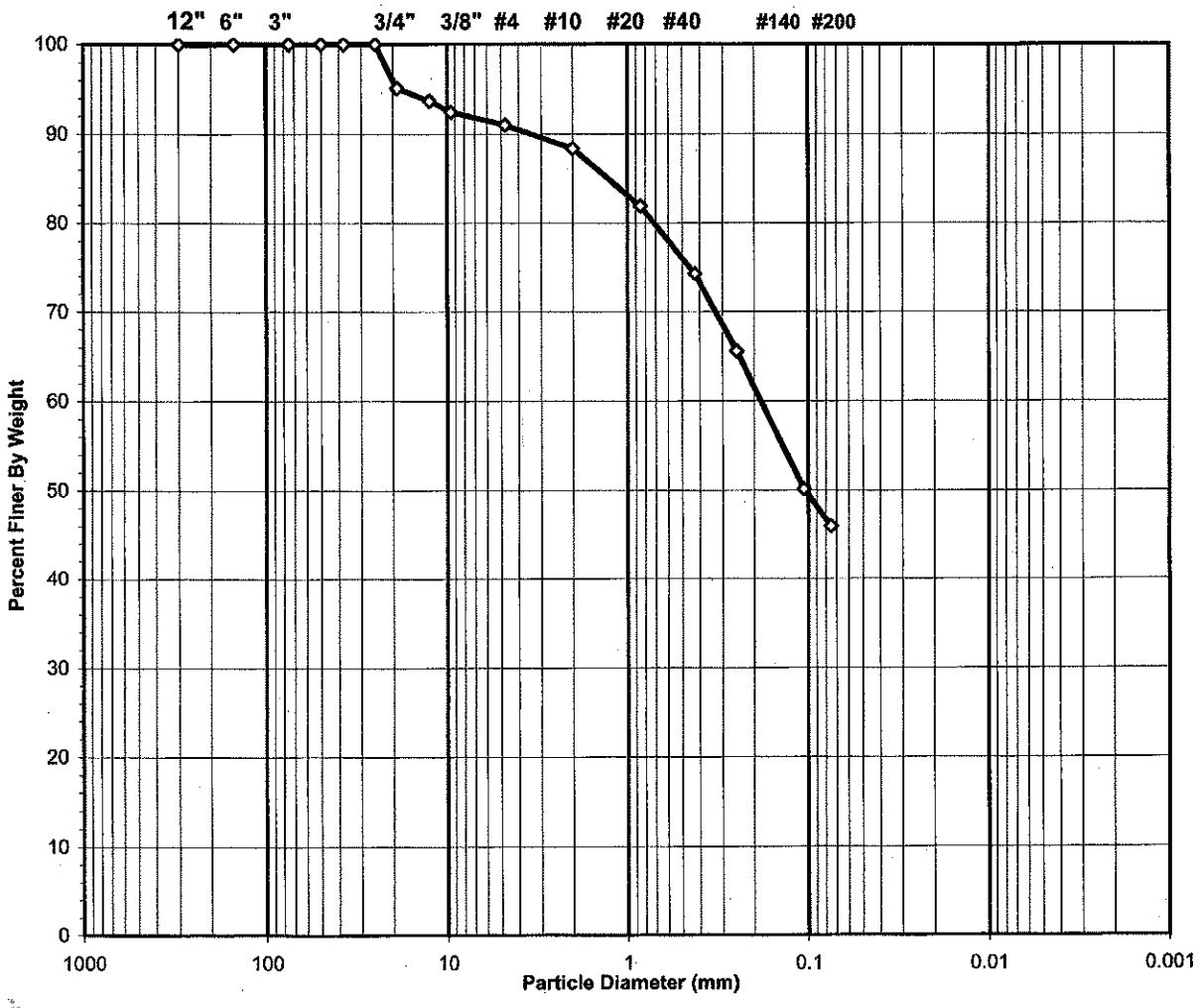
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 24K
Lab ID	2009-633-01-01	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By SD Date 2/27/2009 Checked By GEM Date 3-5-09

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-01 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 24K
Lab ID	2009-633-01-01	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	209	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	758.06	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	626.40	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.77	Weight of Tare (gm)	NA
Weight of Water (gm)	131.66	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	454.63	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**29.0**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	16220.3	Weight of the Dry Specimen (gm)	454.63
Dry Weight - 3/4" Sample (gm)	12577.8	Weight of minus #200 material (gm)	219.46
Wet Weight +3/4" Sample (gm)	643.90	Weight of plus #200 material (gm)	235.17
Dry Weight + 3/4" Sample (gm)	643.90		
Total Dry Weight Sample (gm)	13221.7	**J - Factor (Percent Finer than 3/4")**	**0.9513**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	643.90		4.9	4.9	95.1	**95.1**
1/2"	12.5	6.84		1.5	1.5	98.5	**93.7**
3/8"	9.5	5.87		1.3	2.8	97.2	**92.5**
#4	4.75	7.04		1.5	4.3	95.7	**91.0**
#10	2	12.73		2.8	7.1	92.9	**88.3**
#20	0.85	30.84	(**)	6.8	13.9	86.1	**81.9**
#40	0.425	36.37		8.0	21.9	78.1	**74.3**
#60	0.25	41.64		9.2	31.1	68.9	**65.6**
#140	0.106	73.84		16.2	47.3	52.7	**50.1**
#200	0.075	20.00		4.4	51.7	48.3	**45.9**
Pan	-	219.46		48.3	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By SD Date 2/27/2009 Checked By GEM Date 3-5-09

DCN: CT-S3A DATE 5-17-00 REVISION 3 \\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-01 SIEVON REV 4.XLS]Sheet1

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 28K
Lab ID	2009-633-01-02	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay

USCS Symbol ***CH, TESTED***

USCS Classification ***SANDY FAT CLAY***

Tested By JP Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-02 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 28K
Lab ID	2009-633-01-02	Soil Color	**BROWN**

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)	781.14	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	652.92	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	197.39	Weight of Tare (gm)	NA
Weight of Water (gm)	128.22	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	455.53	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**28.1**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	16878.9	Weight of the Dry Specimen (gm)	455.53
Dry Weight - 3/4" Sample (gm)	13171.5	Weight of minus #200 material (gm)	235.37
Wet Weight +3/4" Sample (gm)	361.07	Weight of plus #200 material (gm)	220.16
Dry Weight + 3/4" Sample (gm)	361.07		
Total Dry Weight Sample (gm)	13532.5	**J - Factor (Percent Finer than 3/4")**	**0.9733**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	361.07		2.7	2.7	97.3	**97.3**
1/2"	12.5	3.33		0.7	0.7	99.3	**96.6**
3/8"	9.5	2.84		0.6	1.4	98.6	**96.0**
#4	4.75	7.56		1.7	3.0	97.0	**94.4**
#10	2	14.64		3.2	6.2	93.8	**91.3**
#20	0.85	26.14	(**)	5.7	12.0	88.0	**85.7**
#40	0.425	32.44		7.1	19.1	80.9	**78.8**
#60	0.25	38.86		8.5	27.6	72.4	**70.5**
#140	0.106	73.41		16.1	43.7	56.3	**54.8**
#200	0.075	20.94		4.6	48.3	51.7	**50.3**
Pan	-	235.37		51.7	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3A DATE 5-17-00 REVISION 3

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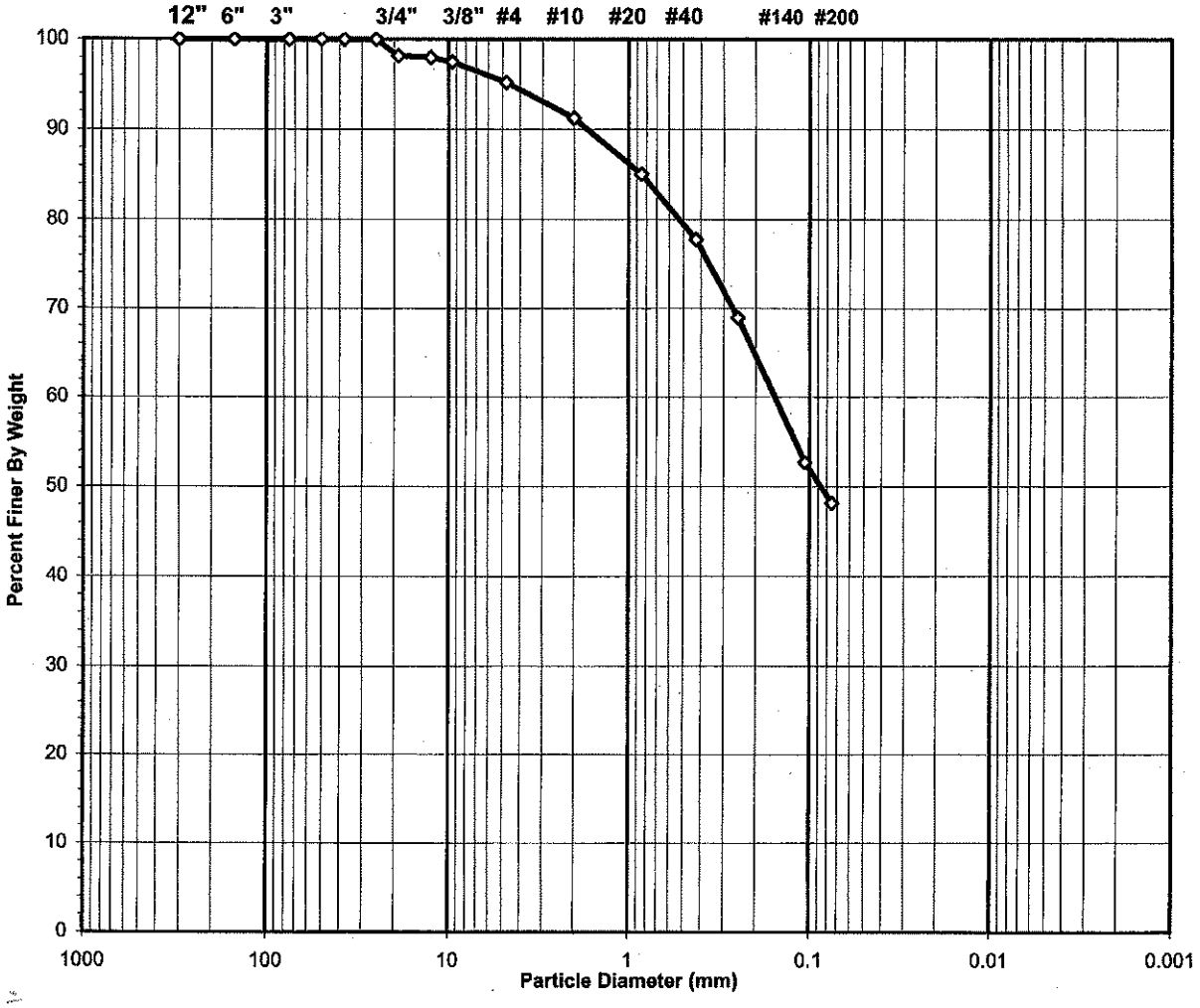
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 32K
Lab ID	2009-633-01-03	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By SD Date 2/27/2009 Checked By GBM Date 3-9-09

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-03 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 32K
Lab ID	2009-633-01-03	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	250	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	594.15	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	497.40	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	169.31	Weight of Tare (gm)	NA
Weight of Water (gm)	96.75	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	328.09	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**29.5**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	17309.9	Weight of the Dry Specimen (gm)	328.09
Dry Weight - 3/4" Sample (gm)	13367.9	Weight of minus #200 material (gm)	160.93
Wet Weight +3/4" Sample (gm)	250.50	Weight of plus #200 material (gm)	167.16
Dry Weight + 3/4" Sample (gm)	250.50		
Total Dry Weight Sample (gm)	13618.4	**J - Factor (Percent Finer than 3/4")**	**0.9816**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	250.50		1.8	1.8	98.2	**98.2**
1/2"	12.5	0.57		0.2	0.2	99.8	**98.0**
3/8"	9.5	1.74		0.5	0.7	99.3	**97.5**
#4	4.75	7.57		2.3	3.0	97.0	**95.2**
#10	2	13.44		4.1	7.1	92.9	**91.2**
#20	0.85	20.52	(**)	6.3	13.4	86.6	**85.0**
#40	0.425	24.23		7.4	20.7	79.3	**77.8**
#60	0.25	29.65		9.0	29.8	70.2	**68.9**
#140	0.106	54.35		16.6	46.4	53.6	**52.7**
#200	0.075	15.09		4.6	50.9	49.1	**48.1**
Pan	-	160.93		49.1	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By SD Date 2/27/2009 Checked By GBM Date 3-9-09

DCN: CT-S3A DATE 5-17-00 REVISION 3 \\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-03 SIEVON REV 4.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 36K
Lab ID	2009-633-01-04	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**

USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By JP Date 2/27/2009 Checked By Gen Date 3-9-09

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-04 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 36K
Lab ID	2009-633-01-04	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	318	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	758.06	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	663.95	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	207.64	Weight of Tare (gm)	NA
Weight of Water (gm)	94.11	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	456.31	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**20.6**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	18627.2	Weight of the Dry Specimen (gm)	456.31
Dry Weight - 3/4" Sample (gm)	15442.3	Weight of minus #200 material (gm)	193.10
Wet Weight +3/4" Sample (gm)	644.20	Weight of plus #200 material (gm)	263.21
Dry Weight + 3/4" Sample (gm)	644.20		
Total Dry Weight Sample (gm)	16086.5	**J - Factor (Percent Finer than 3/4")**	**0.9600**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	644.20		4.0	4.0	96.0	**96.0**
1/2"	12.5	5.30		1.2	1.2	98.8	**94.9**
3/8"	9.5	0.43		0.1	1.3	98.7	**94.8**
#4	4.75	7.95		1.7	3.0	97.0	**93.1**
#10	2	14.47		3.2	6.2	93.8	**90.1**
#20	0.85	30.94	(**)	6.8	12.9	87.1	**83.6**
#40	0.425	50.09		11.0	23.9	76.1	**73.0**
#60	0.25	56.50		12.4	36.3	63.7	**61.1**
#140	0.106	78.36		17.2	53.5	46.5	**44.7**
#200	0.075	19.17		4.2	57.7	42.3	**40.6**
Pan	-	193.10		42.3	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By JP Date 2/27/2009 Checked By CAM Date 3-9-09

DCN: CT-S3A DATE 5-17-00 REVISION 3 *\\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-04 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 40K
Lab ID	2009-633-01-05	Soil Color	**BROWN**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay

USCS Symbol ***SM, TESTED***

USCS Classification ***SILTY SAND***

Tested By SD Date 2/27/2009 Checked By GBM Date 3-4-09

DCN: CT-S3A DATE 6-25-98 REVISION 2 *\\Server\c\2009 PROJECTS\2009-633 THALLE\2009-633-01-05 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 40K
Lab ID	2009-633-01-05	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	839	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	735.98	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	643.39	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	257.94	Weight of Tare (gm)	NA
Weight of Water (gm)	92.59	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	385.45	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**24.0**	**Moisture Content (%)**	**0.0**

Wet Weight -3/4" Sample (gm)	19413.5	Weight of the Dry Specimen (gm)	385.45
Dry Weight - 3/4" Sample (gm)	15653.4	Weight of minus #200 material (gm)	186.62
Wet Weight +3/4" Sample (gm)	163.80	Weight of plus #200 material (gm)	198.83
Dry Weight + 3/4" Sample (gm)	163.80		
Total Dry Weight Sample (gm)	15817.2	**J - Factor (Percent Finer than 3/4")**	**0.9896**

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	0.00		0.0	0.0	100.0	**100.0**
3/4"	19	163.80		1.0	1.0	99.0	**99.0**
1/2"	12.5	7.76		2.0	2.0	98.0	**97.0**
3/8"	9.5	2.04		0.5	2.5	97.5	**96.4**
#4	4.75	7.54		2.0	4.5	95.5	**94.5**
#10	2	11.28		2.9	7.4	92.6	**91.6**
#20	0.85	22.90	(**)	5.9	13.4	86.6	**85.7**
#40	0.425	28.29		7.3	20.7	79.3	**78.5**
#60	0.25	36.17		9.4	30.1	69.9	**69.2**
#140	0.106	65.24		16.9	47.0	53.0	**52.4**
#200	0.075	17.61		4.6	51.6	48.4	**47.9**
Pan	-	186.62		48.4	100.0	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen*

Tested By SD Date 2/27/2009 Checked By GEM Date 3-4-09

DCN: CT-S3A DATE 5-17-00 REVISION 3 \\Server\c\2009 PROJECTS\2009-633 THALLE\[2009-633-01-05 SIEVON REV 4.XLS]Sheet1

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO.MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	VC4K
Lab ID	2008-606-08-03	Soil Description	**DARK 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)

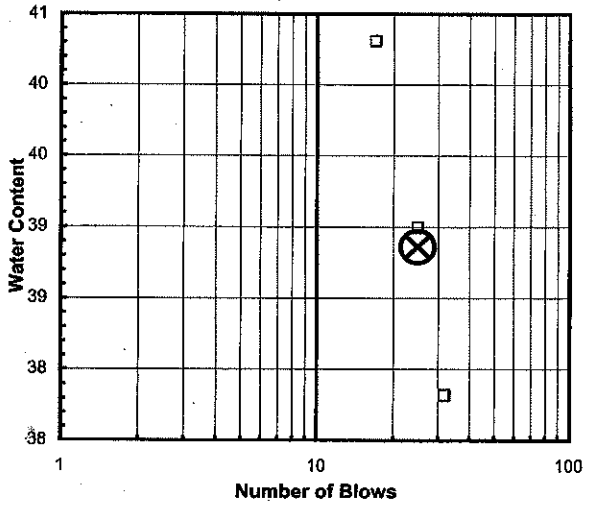
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-I	A-C	A-Q	**U**
Wt. of Tare & WS (gm)	25.54	28.89	29.66	**L**
Wt. of Tare & DS (gm)	22.65	25.17	25.78	**T**
Wt. of Tare (gm)	15.48	15.63	15.52	**I**
Wt. of Water (gm)	2.9	3.7	3.9	**P**
Wt. of DS (gm)	7.2	9.5	10.3	**O**
				I
Moisture Content (%)	**40.3**	**39.0**	**37.8**	**N**
Number of Blows	**17**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-L	A-K	
Wt. of Tare & WS (gm)	22.00	22.12	
Wt. of Tare & DS (gm)	20.75	20.85	
Wt. of Tare (gm)	15.54	15.55	
Wt. of Water (gm)	1.3	1.3	
Wt. of DS (gm)	5.2	5.3	
Moisture Content (%)	**24.0**	**24.0**	**0.0**

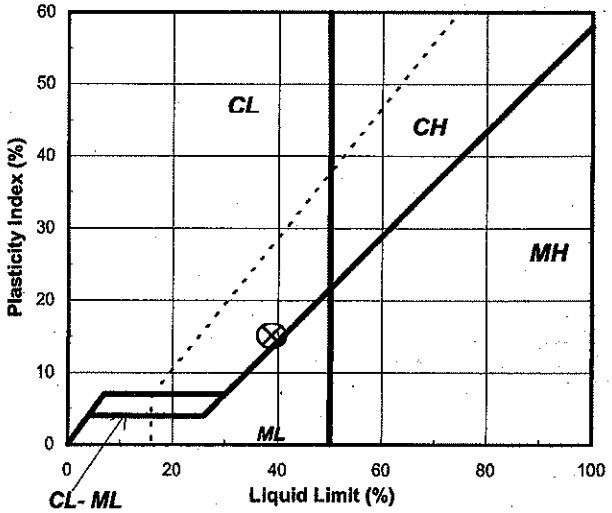
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**39**
Plastic Limit (%)	**24**
Plasticity Index (%)	**15**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 9/9/2008 *Checked By* GEM *Date* 9-10-08

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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-08	Sample No.	VC8K
Lab ID	2008-606-08-04	Soil Description	**DARK BROWN 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)

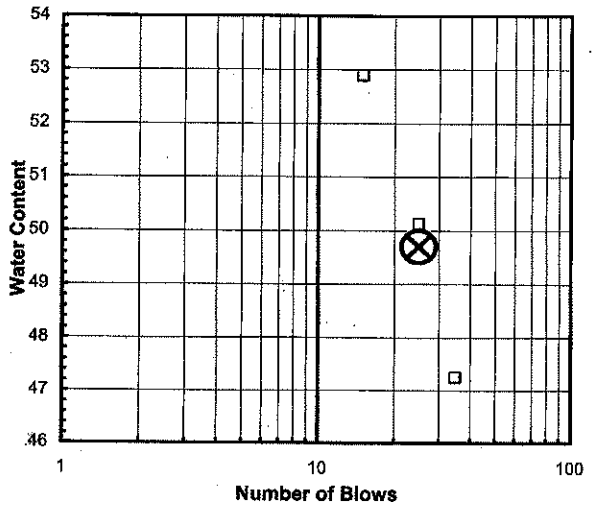
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	L	R	U	**U**
Wt. of Tare & WS (gm)	28.75	27.40	29.86	**L**
Wt. of Tare & DS (gm)	24.07	23.31	25.15	**T**
Wt. of Tare (gm)	15.22	15.15	15.18	**I**
Wt. of Water (gm)	4.7	4.1	4.7	**P**
Wt. of DS (gm)	8.9	8.2	10.0	**O**
				I
Moisture Content (%)	**52.9**	**50.1**	**47.2**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	V	B	
Wt. of Tare & WS (gm)	23.15	23.89	
Wt. of Tare & DS (gm)	20.99	21.56	
Wt. of Tare (gm)	15.26	15.21	
Wt. of Water (gm)	2.2	2.3	
Wt. of DS (gm)	5.7	6.4	
Moisture Content (%)	**37.7**	**36.7**	**1.0**

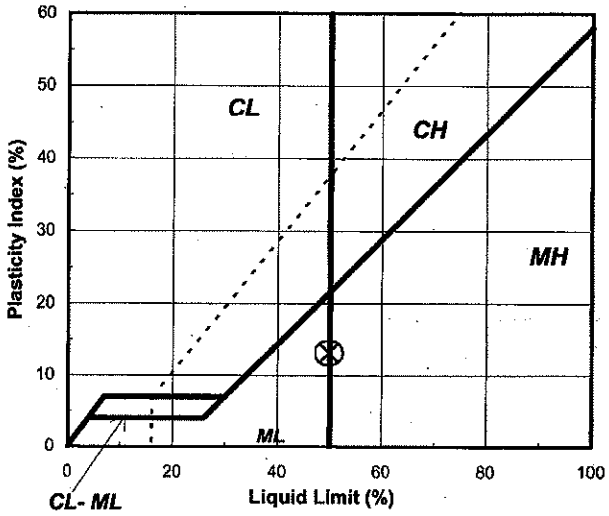
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**50**
Plastic Limit (%)	**37**
Plasticity Index (%)	**13**
USCS Symbol	**MH**

Flow Curve



Plasticity Chart



Tested By JBD *Date* 9/9/2008 *Checked By* CEM *Date* 9-10-08

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	
Project No.	2008-606-11	Sample No.	V.C. 12K
Lab ID	2008-606-11-06	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)

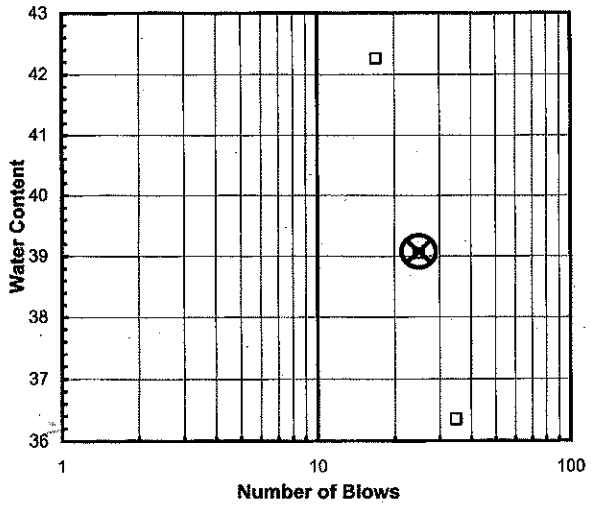
Liquid Limit Test	**1**	**2**	**3**	
Tare Number	U	N	I	MULTIPOINT
Wt. of Tare & WS (gm)	25.92	24.62	28.10	
Wt. of Tare & DS (gm)	22.73	22.00	24.67	
Wt. of Tare (gm)	15.18	15.29	15.23	
Wt. of Water (gm)	3.2	2.6	3.4	
Wt. of DS (gm)	7.6	6.7	9.4	
Moisture Content (%)	**42.3**	**39.0**	**36.3**	
Number of Blows	**17**	**25**	**35**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	J	Y	
Wt. of Tare & WS (gm)	21.59	22.87	
Wt. of Tare & DS (gm)	20.36	21.49	
Wt. of Tare (gm)	15.14	15.66	
Wt. of Water (gm)	1.2	1.4	
Wt. of DS (gm)	5.2	5.8	
Moisture Content (%)	**23.6**	**23.7**	**-0.1**

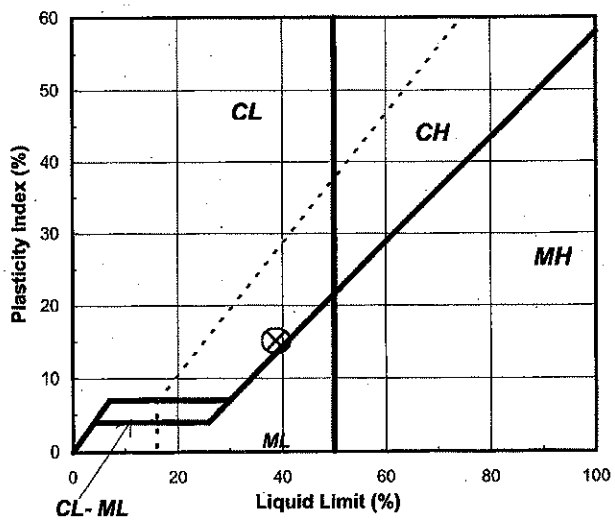
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**39**
Plastic Limit (%)	**24**
Plasticity Index (%)	**15**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 12/2/2008 *Checked By* TMS *Date* 12308

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Geotechnics
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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	V.C. 20K
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2008-606-13	Sample No.	NA
Lab ID	2008-606-13-01	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)

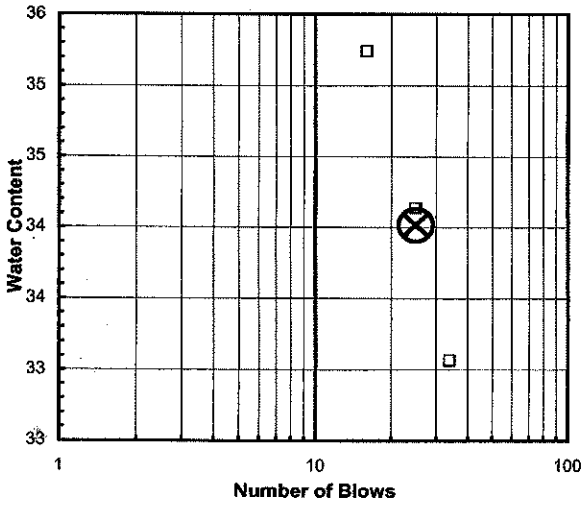
Liquid Limit Test	**1**	**2**	**3**	**MULTIPOINT**
Tare Number	A-F	A-B	T	
Wt. of Tare & WS (gm)	25.63	27.88	26.82	
Wt. of Tare & DS (gm)	22.98	24.75	23.93	
Wt. of Tare (gm)	15.46	15.58	15.19	
Wt. of Water (gm)	2.7	3.1	2.9	
Wt. of DS (gm)	7.5	9.2	8.7	
Moisture Content (%)	**35.2**	**34.1**	**33.1**	
Number of Blows	**16**	**25**	**34**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	E	A-M	
Wt. of Tare & WS (gm)	21.62	23.14	
Wt. of Tare & DS (gm)	20.44	21.71	
Wt. of Tare (gm)	15.30	15.36	
Wt. of Water (gm)	1.2	1.4	
Wt. of DS (gm)	5.1	6.4	
Moisture Content (%)	**23.0**	**22.5**	**0.4**

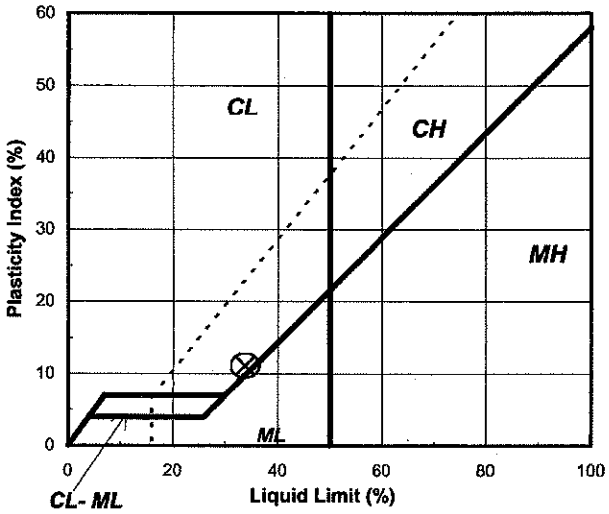
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**34**
Plastic Limit (%)	**23**
Plasticity Index (%)	**11**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 12/31/2009 *Checked By* GBM *Date* 1-5-09

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO., INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 24K
Lab ID	2009-633-01-01	Soil Description	**BROWN 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)

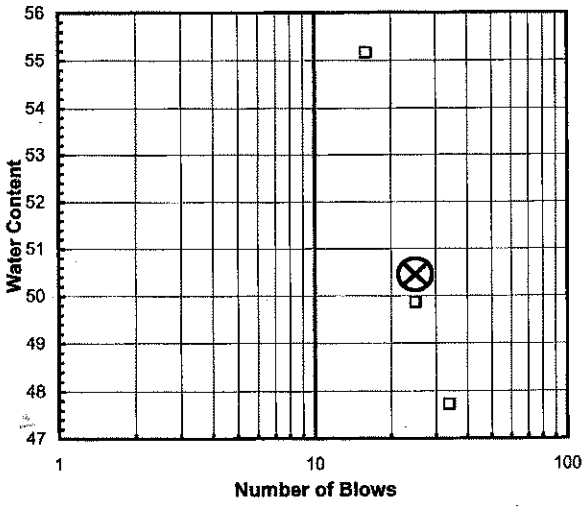
Liquid Limit Test	**1**	**2**	**3**	MULTIPOINT
Tare Number	B-B	A-T	K-A	
Wt. of Tare & WS (gm)	25.90	26.04	25.53	
Wt. of Tare & DS (gm)	22.21	22.56	22.29	
Wt. of Tare (gm)	15.52	15.58	15.50	
Wt. of Water (gm)	3.7	3.5	3.2	
Wt. of DS (gm)	6.7	7.0	6.8	
Moisture Content (%)	**55.2**	**49.9**	**47.7**	
Number of Blows	**16**	**25**	**34**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-N	A-D	
Wt. of Tare & WS (gm)	22.05	21.94	
Wt. of Tare & DS (gm)	20.56	20.48	
Wt. of Tare (gm)	15.44	15.41	
Wt. of Water (gm)	1.5	1.5	
Wt. of DS (gm)	5.1	5.1	
Moisture Content (%)	**29.1**	**28.8**	**0.3**

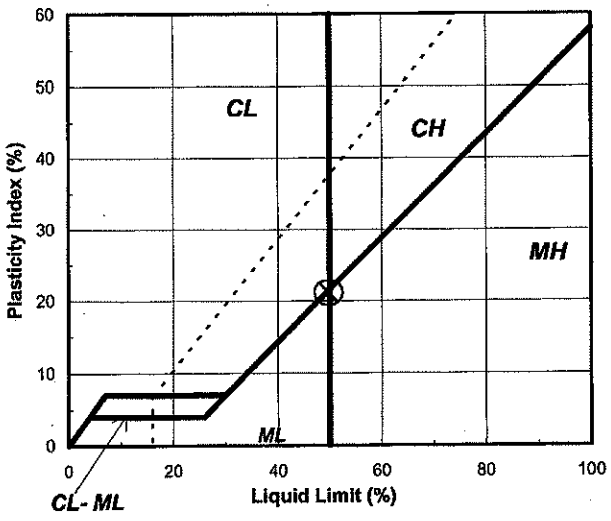
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**50**
Plastic Limit (%)	**29**
Plasticity Index (%)	**21**
USCS Symbol	**MH**

Flow Curve



Plasticity Chart



Tested By SD *Date* 3/4/2009 *Checked By* GEM *Date* 3-5-09

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 28K
Lab ID	2009-633-01-02	Soil Description	**BROWN FAT 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	N	J
Wt. of Tare & WS (gm)	24.90	27.21	26.48
Wt. of Tare & DS (gm)	21.56	23.20	22.82
Wt. of Tare (gm)	15.23	15.29	15.15
Wt. of Water (gm)	3.3	4.0	3.7
Wt. of DS (gm)	6.3	7.9	7.7
Moisture Content (%)	**52.8**	**50.7**	**47.7**
Number of Blows	**17**	**25**	**32**

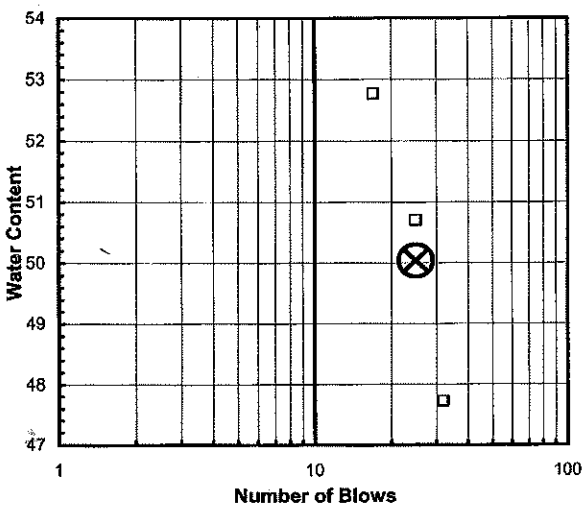
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	Y	U	
Wt. of Tare & WS (gm)	22.19	21.58	
Wt. of Tare & DS (gm)	20.76	20.20	
Wt. of Tare (gm)	15.64	15.18	
Wt. of Water (gm)	1.4	1.4	
Wt. of DS (gm)	5.1	5.0	
Moisture Content (%)	**27.9**	**27.5**	**0.4**

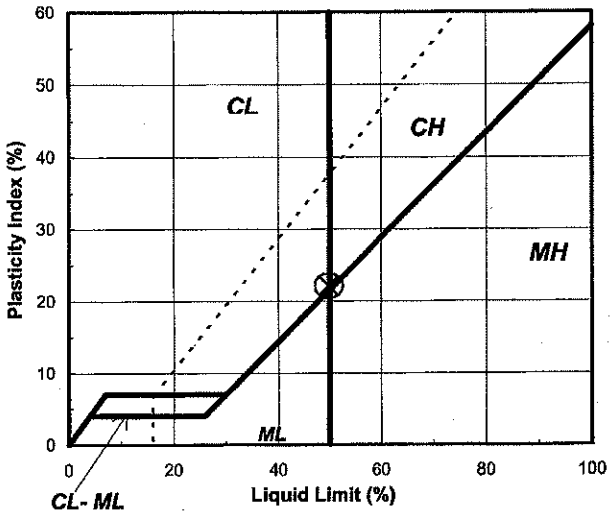
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**50**
Plastic Limit (%)	**28**
Plasticity Index (%)	**22**
USCS Symbol	**CH**

Flow Curve



Plasticity Chart



Tested By SD *Date* 3/2/2009 *Checked By* CEM *Date* 3-4-09

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 32K
Lab ID	2009-633-01-03	Soil Description	**BROWN FAT 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)

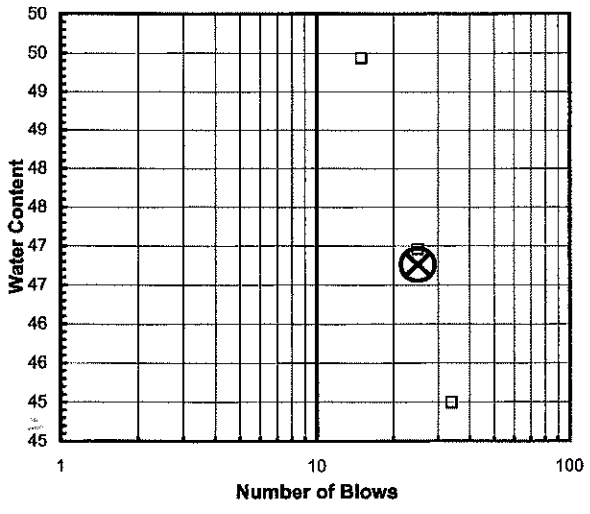
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	I	J	Y	**U**
Wt. of Tare & WS (gm)	29.63	30.84	27.34	**L**
Wt. of Tare & DS (gm)	24.87	25.83	23.70	**T**
Wt. of Tare (gm)	15.24	15.16	15.61	**I**
Wt. of Water (gm)	4.8	5.0	3.6	**P**
Wt. of DS (gm)	9.6	10.7	8.1	**O**
				I
Moisture Content (%)	**49.4**	**47.0**	**45.0**	**N**
Number of Blows	**15**	**25**	**34**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	U	N	
Wt. of Tare & WS (gm)	21.67	22.44	
Wt. of Tare & DS (gm)	20.30	20.93	
Wt. of Tare (gm)	15.16	15.29	
Wt. of Water (gm)	1.4	1.5	
Wt. of DS (gm)	5.1	5.6	
Moisture Content (%)	**26.7**	**26.8**	**-0.1**

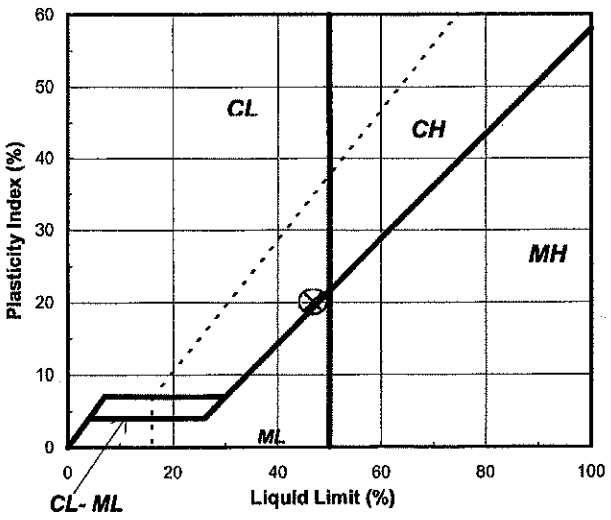
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**47**
Plastic Limit (%)	**27**
Plasticity Index (%)	**20**
USCS Symbol	**CH**

Flow Curve



Plasticity Chart



Tested By JBD *Date* 03/06/09 *Checked By* CEM *Date* 3-9-09

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION CO, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 36K
Lab ID	2009-633-01-04	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)

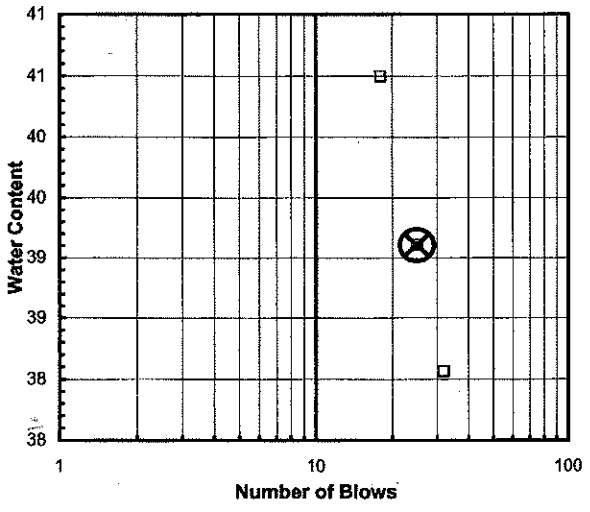
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-D	A-N	B-B	**U**
Wt. of Tare & WS (gm)	26.19	27.24	28.19	**L**
Wt. of Tare & DS (gm)	23.08	23.92	24.70	**T**
Wt. of Tare (gm)	15.40	15.43	15.53	**I**
Wt. of Water (gm)	3.1	3.3	3.5	**P**
Wt. of DS (gm)	7.7	8.5	9.2	**O**
				I
Moisture Content (%)	**40.5**	**39.1**	**38.1**	**N**
Number of Blows	**18**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	K-A	A-T	
Wt. of Tare & WS (gm)	22.32	21.78	
Wt. of Tare & DS (gm)	20.96	20.56	
Wt. of Tare (gm)	15.50	15.58	
Wt. of Water (gm)	1.4	1.2	
Wt. of DS (gm)	5.5	5.0	
Moisture Content (%)	**24.9**	**24.5**	**0.4**

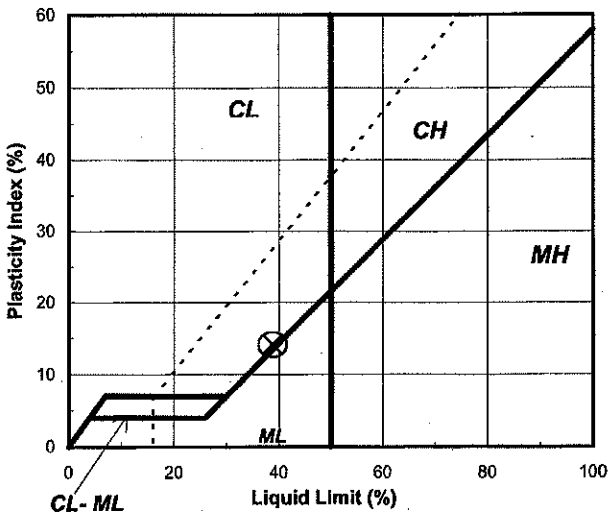
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**39**
Plastic Limit (%)	**25**
Plasticity Index (%)	**14**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	THALLE CONSTRUCTION, INC.	Boring No.	NA
Client Reference	NORTH WAKE CO. MSW LF CLOSURE	Depth (ft)	NA
Project No.	2009-633-01	Sample No.	V.C. 40K
Lab ID	2009-633-01-05	Soil Description	**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)

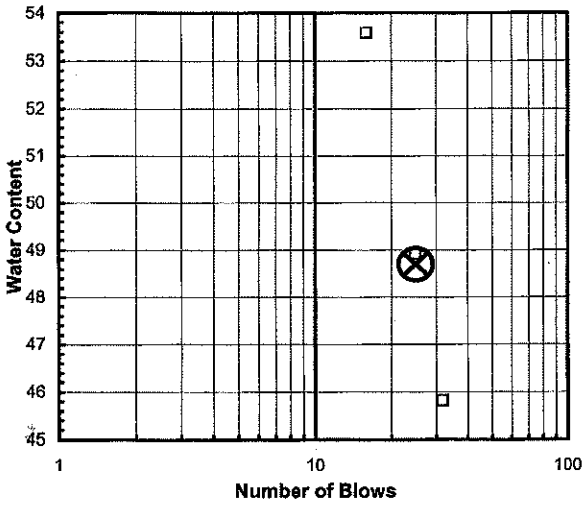
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	U	I	J	**U**
Wt. of Tare & WS (gm)	25.95	28.26	27.51	**L**
Wt. of Tare & DS (gm)	22.20	23.98	23.63	**T**
Wt. of Tare (gm)	15.20	15.23	15.16	**I**
Wt. of Water (gm)	3.8	4.3	3.9	**P**
Wt. of DS (gm)	7.0	8.8	8.5	**O**
				I
Moisture Content (%)	**53.6**	**48.9**	**45.8**	**N**
Number of Blows	**16**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	Y	N	
Wt. of Tare & WS (gm)	23.01	21.73	
Wt. of Tare & DS (gm)	21.29	20.23	
Wt. of Tare (gm)	15.62	15.30	
Wt. of Water (gm)	1.7	1.5	
Wt. of DS (gm)	5.7	4.9	
Moisture Content (%)	**30.3**	**30.4**	**-0.1**

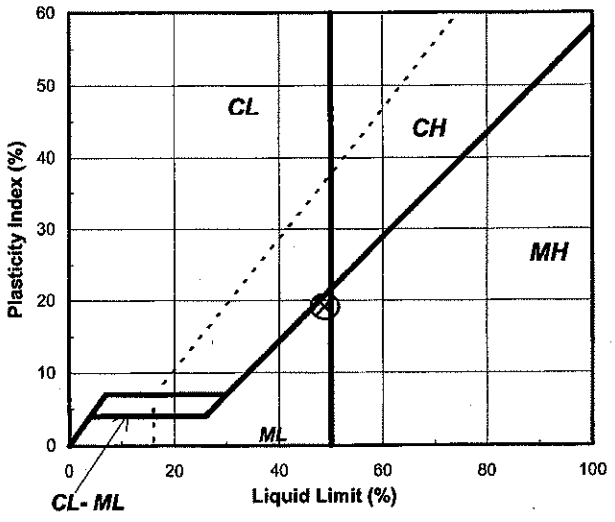
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**49**
Plastic Limit (%)	**30**
Plasticity Index (%)	**19**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By SD *Date* 3/3/2009 *Checked By* afm *Date* 3-4-09

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INTEGRITY IN TESTING

Moisture, Ash, and Organic Matter (Loss on Ignition)

ASTM D 2974-00, AASHTO T-267 (SOP - S8)

Client	THALLE CONSTRUCTION
Client Reference	North Wake Co. MSW LF Closure
Project No.	2008-606-13

Moisture Content (Oven Dried, minus #10 Sieve Material)

Lab ID	01
Boring No.	V.C. 20K
Depth(ft).	NA
Sample No.	NA
Tare Number	14+16
Wt. Tare & WS (gm)	122.17
Wt. Tare & DS (gm)	108.23
Wt. Tare (gm)	37.35
Wt. Water (gm)	13.94
Wt. DS (gm)	70.88
Moisture Content	**19.7%**

Ash Content, Organic Matter

Furnace Temperature ° C	440
Wt. Tare & Ash (gm)	105.06
Wt. Volatiles (gm)	3.17
Wt. Ash (gm)	67.71
Ash Content	**95.5%**
Organic Matter	**4.5%**

Tested By DB *Date* 12/31/08 *Checked By* MB *Date* 1-2-09

DCN: CT-S8 DATE: 04/02/08 REVISION:3

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Geotechnics
INTEGRITY IN TESTING

Moisture, Ash, and Organic Matter (Loss on Ignition)

ASTM D 2974-00, AASHTO T-267 (SOP - S8)

Client	THALLE CONSTRUCTION
Client Reference	NORTH WAKE CO. MSW LF CLOSURE
Project No.	2009-633-01

Moisture Content (Oven Dried, minus #10 Sieve Material)

Lab ID	01	02	03	04	05
Boring No.	NA	NA	NA	NA	NA
Depth(ft).	NA	NA	NA	NA	NA
Sample No.	V.C. 24K	V.C. 28K	V.C. 32K	V.C. 36K	V.C. 40K
Tare Number	L+11	16+14	27+H	X+M	A+I
Wt. Tare & WS (gm)	94.67	92.13	90.79	105.94	102.98
Wt. Tare & DS (gm)	83.04	80.52	79.76	96.16	91.40
Wt. Tare (gm)	37.75	37.36	38.33	37.61	38.26
Wt. Water (gm)	11.63	11.61	11.03	9.78	11.58
Wt. DS (gm)	45.29	43.16	41.43	58.55	53.14
Moisture Content	**25.7%**	**26.9%**	**26.6%**	**16.7%**	**21.8%**

Ash Content, Organic Matter

Furnace Temperature ° C	440	440	440	440	440
Wt. Tare & Ash (gm)	79.93	77.41	76.64	93.78	88.87
Wt. Volatiles (gm)	3.11	3.11	3.12	2.38	2.53
Wt. Ash (gm)	42.18	40.05	38.31	56.17	50.61
Ash Content	**93.1%**	**92.8%**	**92.5%**	**95.9%**	**95.2%**
Organic Matter	**6.9%**	**7.2%**	**7.5%**	**4.1%**	**4.8%**

Tested By PC *Date* 3/3/09 *Checked By* KB *Date* 3-5-09

DCN: CT-S8 DATE: 04/02/08 REVISION:3

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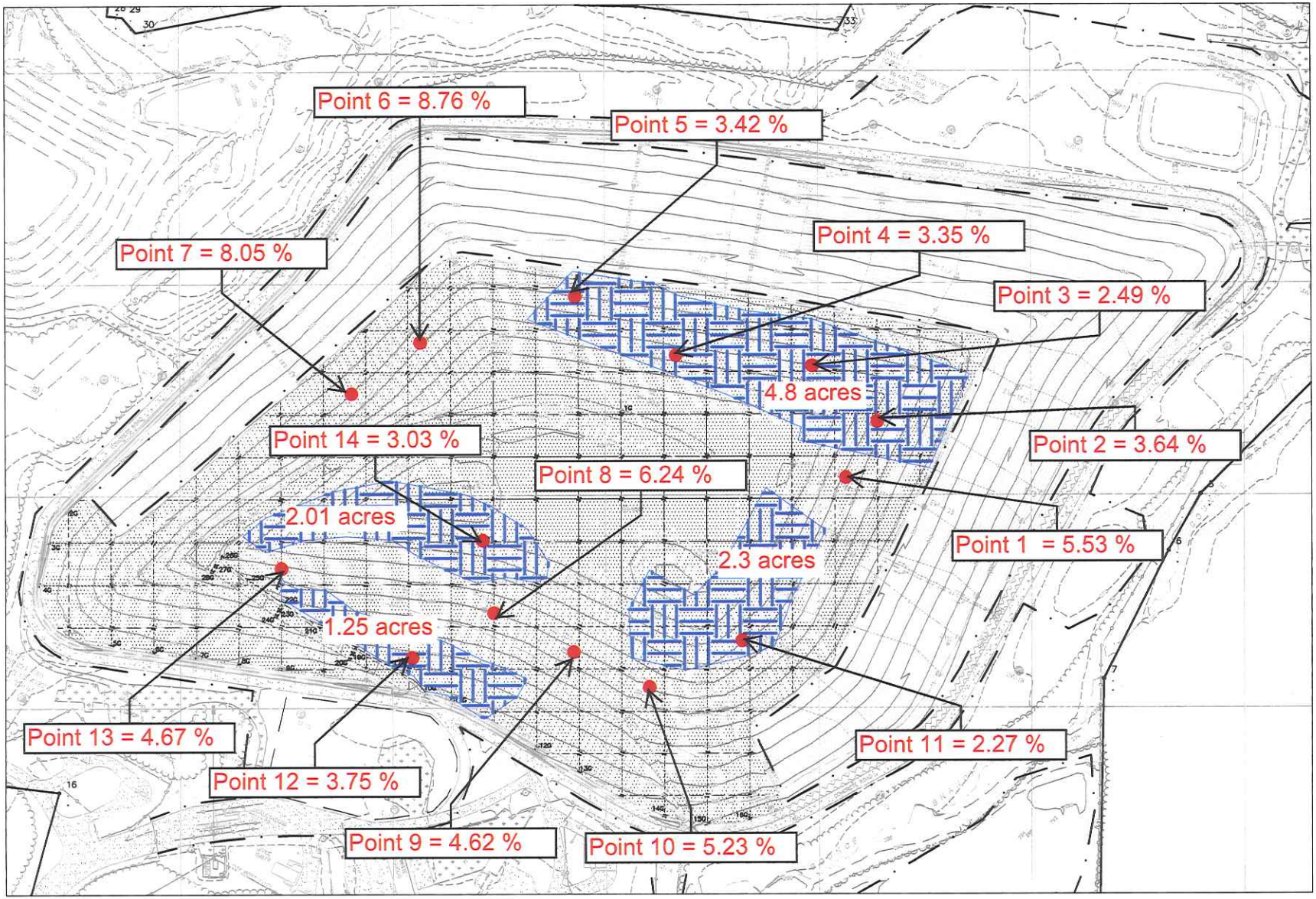
APPENDIX A-6

Vegetative Cover Organic Content Testing and Improvement


Point 6 = 8.76 %
Point 5 = 3.42 %
Point 4 = 3.35 %
Point 7 = 8.05 %
Point 3 = 2.49 %
4.8 acres
Point 14 = 3.03 %
Point 2 = 3.64 %
Point 8 = 6.24 %
2.01 acres
Point 1 = 5.53 %
2.3 acres
1.25 acres
Point 13 = 4.67 %
Point 11 = 2.27 %
Point 12 = 3.75 %
Point 9 = 4.62 %
Point 10 = 5.23 %
Sampling Location
Area where additive is needed
CDM

Terracon

ORGANIC CONTENT

(ASTM D2974-07a)

Project No. 70081052 **Project Name** North Wake Landfill
Tested By D Jensen **Reviewed By**
Test Date 3/17/2009 **Review Date**
Sample Date 3/12/2009

Lab ID#	11570	11571	11572	
Boring No.	S-1	S-2	S-3	
Sample No.	1	2	3	
Sample Depth	Bulk	Bulk	Bulk	
A) Tare No.	D-13	D-25	D-18	
B) Tare Weight, grams	105.63	114.07	106.83	
C) Wet Soil + Tare, grams	272.42	262.47	267.26	
D) Dry Soil + Tare, grams	253.12	248.59	240.54	
E) Weight of Dry Soil, grams [D - B]	147.49	134.52	133.71	
F) Weight of Moisture, grams [C - D]	19.32	13.88	26.72	
G) Moisture Content, % [F * 100 / E]	13.1	10.3	20.0	
(based on oven-dried weight)				
H) Tare No.	L	B	F	
I) Weight of Tare, grams	52.52	54.60	52.52	
J) Weight of Oven-Dried Soil + Tare, grams	138.32	132.16	133.58	
K) Weight of Oven- Dried Soil, grams [J - I]	85.80	77.56	81.06	
L) Weight of Ignited Soil + Tare, grams	135.10	128.54	131.12	
M) Ash, grams [L - I]	82.58	73.94	78.60	
N) Ash Content, % [M *100 / K]	96.25	95.33	96.97	
O) Organic Matter, % [100 - N]	3.75	4.67	3.03	

Comments:

Terracon

ORGANIC CONTENT

(ASTM D2974-07a)

Project No. 70081052 **Project Name** North Wake Landfill
Tested By D Jensen **Reviewed By** _____
Test Date 2/2/2009 **Review Date** _____
Sampled On 1/29/2009

Lab ID#	11489	11490	11491	11492
Boring No.	NWLF	NWLF	NWLF	NWLF
Sample No.	1	2	3	4
Sample Depth	Bulk	Bulk	Bulk	Bulk
A) Tare No.	D-26	D-16	D-21	D-6
B) Tare Weight, grams	113.87	106.72	115.13	104.01
C) Wet Soil + Tare, grams	310.50	345.92	316.97	305.03
D) Dry Soil + Tare, grams	254.03	291.12	265.3	247.12
E) Weight of Dry Soil, grams [D - B]	140.16	184.40	150.17	143.11
F) Weight of Moisture, grams [C - D]	56.47	54.80	51.67	57.91
G) Moisture Content, % [F * 100 / E]	40.3	29.7	34.4	40.5
(based on oven-dried weight)				
H) Tare No.	F	B	B	F
I) Weight of Tare, grams	52.52	54.60	54.60	52.52
J) Weight of Over-Dried Soil + Tare, grams	133.75	137.77	137.63	130.2
K) Weight of Oven- Dried Soil, grams [J - I]	81.23	83.17	83.03	77.68
L) Weight of Ignited Soil + Tare, grams	128.68	133.93	133.29	128.44
M) Ash, grams [L - I]	76.16	79.33	78.69	75.92
N) Ash Content, % [M *100 / K]	93.76	95.38	94.77	97.73
O) Organic Matter, % [100 - N]	6.24	4.62	5.23	2.27

Comments:

Terracon

ORGANIC CONTENT

(ASTM D2974-07a)

Project No.	**70081052**	**Project Name**	**NWLF**
Tested By	**D Jensen**	**Reviewed By**	
Test Date	**10/10/2008**	**Review Date**	

Lab ID#	11428	11429	11430	11431
Boring No.	NE Slope Top of Hill	NE Slope Top of Hill	NE Slope Midway Down	East Slope Top of Hill
Sample No.	1	2	3	4
Sample Depth	Subgrade	Subgrade	Subgrade	Subgrade
A) Tare No.	D-3	D-1	D-22	D-15
B) Tare Weight, grams	111.74	111.45	115.07	106.87
C) Wet Soil + Tare, grams	321.95	310.05	336.4	321.49
D) Dry Soil + Tare, grams	286.88	276.09	311.92	278.53
E) Weight of Dry Soil, grams [D - B]	175.14	164.64	196.85	171.66
F) Weight of Moisture, grams [C - D]	35.07	33.96	24.48	42.96
G) Moisture Content, % [F * 100 / E]	20.0	20.6	12.4	25.0
(based on oven-dried weight)				
H) Tare No.	B	F	B	F
I) Weight of Tare, grams	54.59	52.52	54.59	52.52
J) Weight of Oven-Dried Soil + Tare, grams	125.01	133.14	119.9	117.45
K) Weight of Oven- Dried Soil, grams [J - I]	70.42	80.62	65.31	64.93
L) Weight of Ignited Soil + Tare, grams	122.45	131.13	114.18	112.22
M) Ash, grams [L - I]	67.86	78.61	59.59	59.70
N) Ash Content, % [M *100 / K]	96.36	97.51	91.24	91.95
O) Organic Matter, % [100 - N]	3.64	2.49	8.76	8.05

Comments:

N:\Projects\2008\70081052\Organic Content (Samples 1-4_70081052).xls

Terracon

ORGANIC CONTENT

(ASTM D2974-07a)

Project No.	70081052	**Project Name**	NWLF
Tested By	D Jensen	**Reviewed By**	
Test Date	10/10/2008	**Review Date**	

Lab ID#	11432	11433	11434	
Boring No.	East Slope Top of Hill	NW Slope Midway Down	NW Slope Bottom Half	
Sample No.	5	6	7	
Sample Depth	Subgrade	Subgrade	Subgrade	
A) Tare No.	D-12	D-29	D-11	
B) Tare Weight, grams	109.94	113.68	104.69	
C) Wet Soil + Tare, grams	379.65	334.33	346.47	
D) Dry Soil + Tare, grams	333.44	296.85	313.23	
E) Weight of Dry Soil, grams [D - B]	223.50	183.17	208.54	
F) Weight of Moisture, grams [C - D]	46.21	37.48	33.24	
G) Moisture Content, % [F * 100 / E]	20.7	20.5	15.9	
(based on oven-dried weight)				
H) Tare No.	B	F	B	
I) Weight of Tare, grams	54.59	52.52	54.59	
J) Weight of Oven-Dried Soil + Tare, grams	134.33	134.28	139.97	
K) Weight of Oven- Dried Soil, grams [J - I]	79.74	81.76	85.38	
L) Weight of Ignited Soil + Tare, grams	129.92	131.54	137.05	
M) Ash, grams [L - I]	75.33	79.02	82.46	
N) Ash Content, % [M *100 / K]	94.47	96.65	96.58	
O) Organic Matter, % [100 - N]	5.53	3.35	3.42	

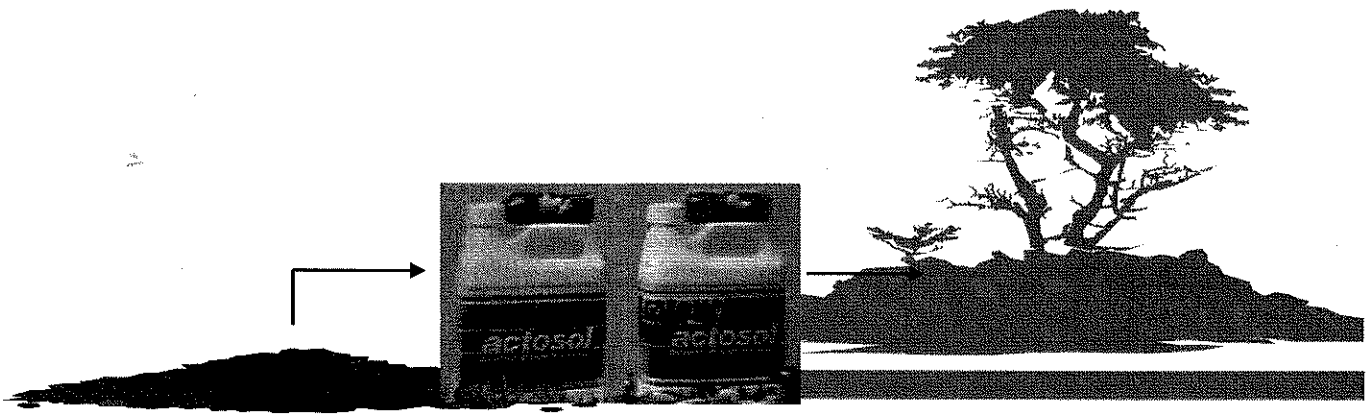
Comments:

N:\Projects\2008\70081052\Organic Content (Samples 5-7_70081052).xls

actosol®

Humic Acid Fertilizer

- **Increases yields of crops, vegetables and fruits**
- **Produces superior turf and deep roots**
- **Enhances uptake of fertilizers**
- **Replenishes depleted soils**
- **Promotes ecological balance**



HUMIC ACIDS

Derivatives of naturally occurring humus matter in soil, humic acids are the key ingredient in all actosol® products. Humic acids are active elements in organic soils and are important for the conversion of fertilizer into available plant nutrients.

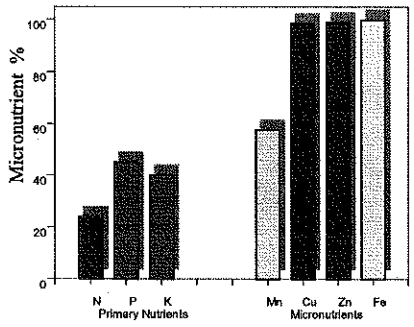
HOW DOES actosol® CREATE BENEFITS?

- By enhancing soil structure and fertility through the addition of vital organic matter in the soil;
- By efficient transfer of fertilizer nutrients and micronutrients because of the high chelation and cation exchange proportion of the active humic acid components of actosol®;
- By increasing moisture holding capacity of soil;
- By increasing microbial activity in the soil; and
- By enhancing plant cell biomass.

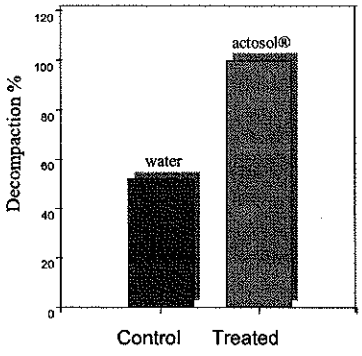
APPLICATION OF actosol®

- Agriculture
- Floriculture
- Mine/Landfill reclamation
- Road/Highway erosion control
- Horticulture
- Turf Management/Maintenance
- Dune stabilization
- Hydroseeding

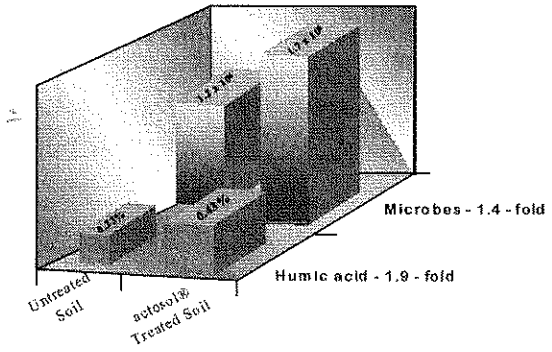
Primary and micronutrients bound to actosol® humic acid



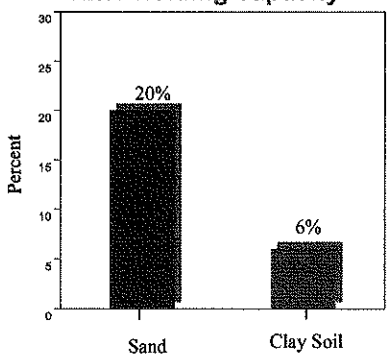
actosol® improves soil structure



Microbial counts and humic acid content are higher in actosol® treated soils



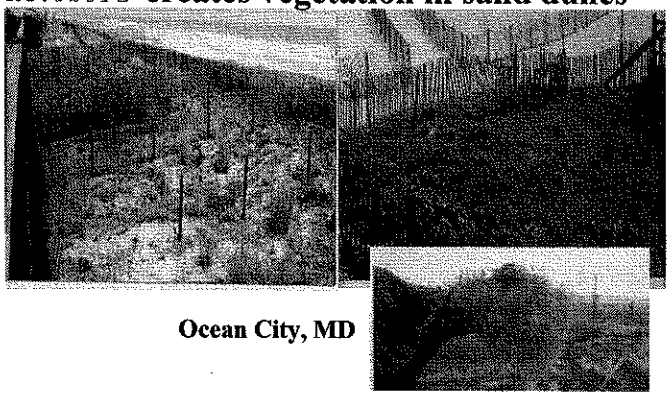
actosol® humic acid increases water holding capacity



Magic of actosol®

Turf

actosol® creates vegetation in sand dunes



Ocean City, MD

hydroseed mix **hydroseed mix plus actosol®**

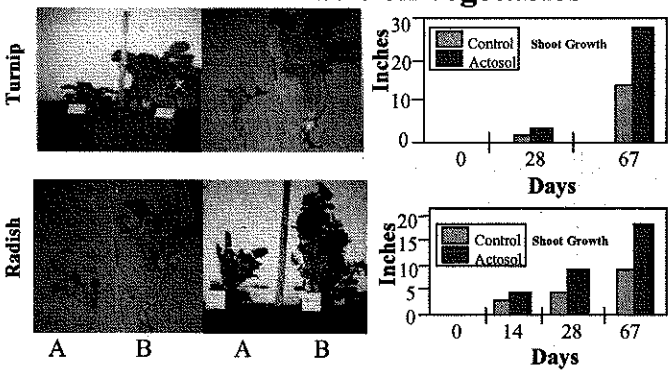
6 weeks growth, Virginia Tech., testing

Floriculture

actosol® brightens flowers

Horticulture

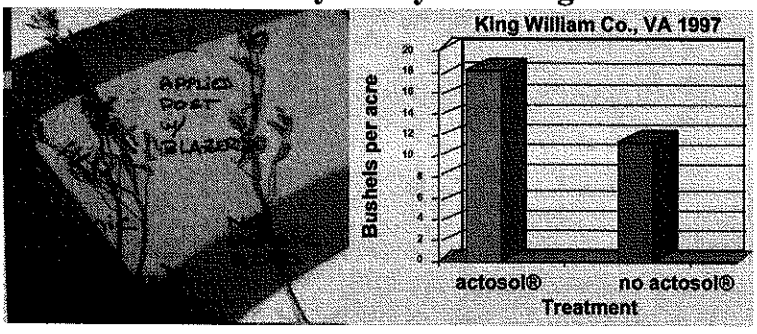
actosol® miracle on vegetables



A - Standard Garden (20-20-20) B - Garden actosol® (10-10-10)

Agriculture

60% increase in soybean yield using actosol®

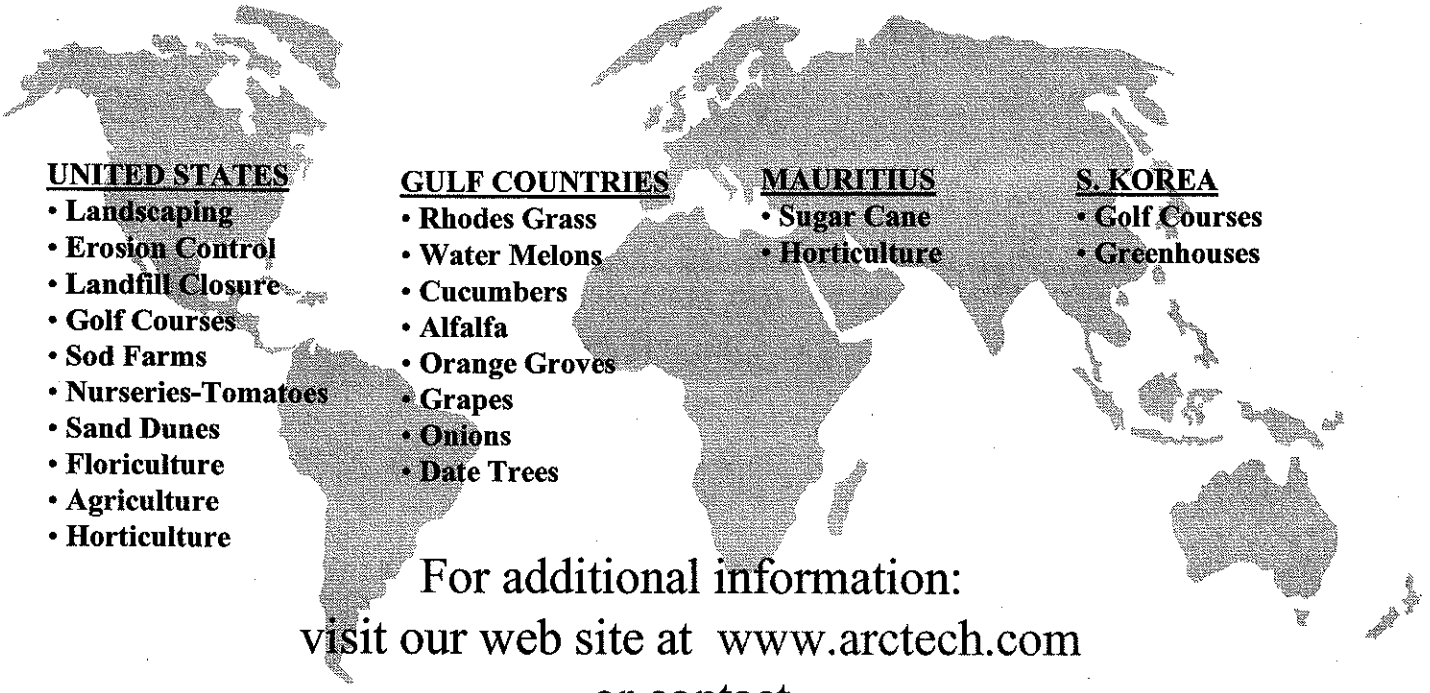


effect of actosol® on corn plants

actosol® Commercial Products

Base actosol®	-	**Humic Acid**
Calcium actosol®	-	**plus 10 Ca**
Garden actosol®	-	**plus 10-10-10 NPK**
Turf Booster actosol®	-	**plus 20-5-5 NPK**
Chelated Micronutrient actosol®	-	**plus Fe, Zn, Cu, Mn, etc.**
Bio-Activated Granular actosol®	-	**plus Microbes**

Worldwide actosol® Applications



UNITED STATES
- Landscaping
- Erosion Control
- Landfill Closure
- Golf Courses
- Sod Farms
- Nurseries-Tomatoes
- Sand Dunes
- Floriculture
- Agriculture
- Horticulture

GULF COUNTRIES
- Rhodes Grass
- Water Melons
- Cucumbers
- Alfalfa
- Orange Groves
- Grapes
- Onions
- Date Trees

MAURITIUS
- Sugar Cane
- Horticulture

S. KOREA
- Golf Courses
- Greenhouses

For additional information:
visit our web site at www.arctech.com
or contact

ARCTECH, Inc.
14100 Park Meadow Drive
Chantilly, VA 20151

(703) 222-0280 (p) - (703) 222-0299 (f)
(800) 471-8494

ARCTECH

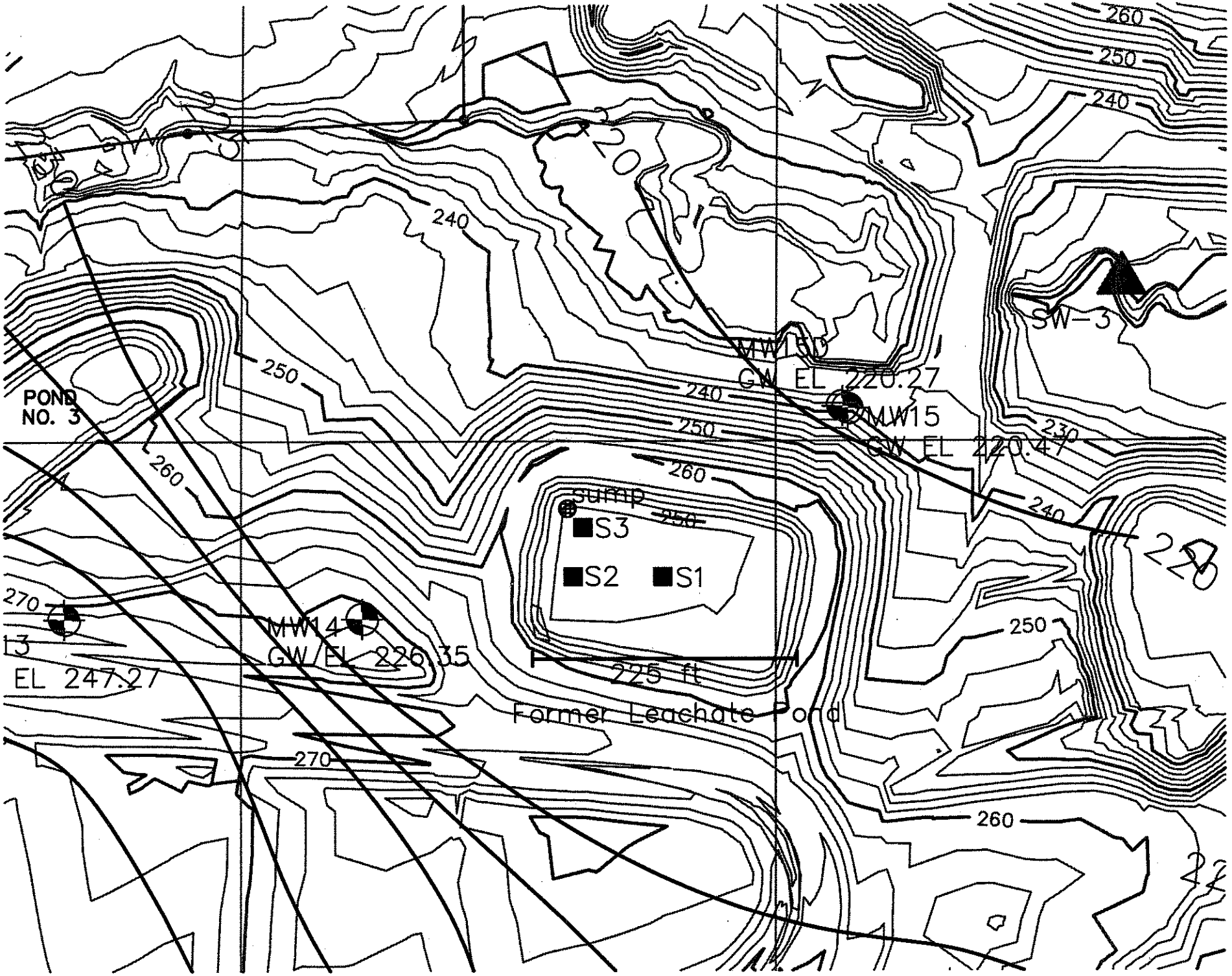
Preserving tomorrow's world...today!

APPENDIX A-7

Leachate Pond Soil Sampling Results

APPENDIX A-7

Samples from the Leachate Pond


260
250
240
230
220
POND
NO. 3
MW15D
GW EL 220.27
MW15
GW EL 220.47
SW-3
sump
S3
S2
S1
MW14
GW EL 226.35
EL 247.27
225 ft
Former Leachate Pond
270

SGS

Dan Forbes
Camp, Dresser & McKee
5400 Glenwood Avenue
Raleigh, NC 27612

Report Number: G175-685

Client Project: N Wake Leachate Pond at Lined Landfill

Dear Dan Forbes,

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call SGS Environmental Services at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS Environmental Services for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
SGS Environmental Services, Inc.

1/8/09

Project Manager
Ashley Nifong

Date

List of Reporting Abbreviations
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:
1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.021808.4

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260 Appendix II

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-685-1A
Lab Project ID: G175-685
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 12-31-2008 11:10
Date Received: 1/2/2009
Matrix: Soil
Sample Amount: 5.11 g
%Solids: 80.1

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	MDL UG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	60.9	8.42	1	1/5/2009	
Acetonitrile	BQL	1220	123	1	1/5/2009	
Acrolein	BQL	60.9	9.53	1	1/5/2009	
Acrylonitrile	BQL	60.9	14.6	1	1/5/2009	
Allyl chloride	BQL	6.09	2.06	1	1/5/2009	
Benzene	BQL	6.09	1.30	1	1/5/2009	
Bromochloromethane	BQL	6.09	2.10	1	1/5/2009	
Bromodichloromethane	BQL	6.09	1.21	1	1/5/2009	
Bromoform	BQL	6.09	1.22	1	1/5/2009	
Bromomethane	BQL	6.09	1.28	1	1/5/2009	
2-Butanone	BQL	30.5	6.62	1	1/5/2009	
Carbon disulfide	BQL	6.09	3.27	1	1/5/2009	
Carbon tetrachloride	BQL	6.09	1.24	1	1/5/2009	
Chlorobenzene	BQL	6.09	1.45	1	1/5/2009	
Chloroethane	BQL	6.09	1.94	1	1/5/2009	
2-Chloroethyl vinyl ether	BQL	6.09	8.63	1	1/5/2009	
Chloroform	BQL	6.09	1.46	1	1/5/2009	
Chloromethane	BQL	6.09	1.38	1	1/5/2009	
Chloroprene	BQL	6.09	1.39	1	1/5/2009	
Dibromochloromethane	BQL	6.09	1.68	1	1/5/2009	
1,2-Dibromo-3-chloropropan	BQL	30.5	1.77	1	1/5/2009	
Dibromomethane	BQL	6.09	1.84	1	1/5/2009	
1,2-Dibromoethane	BQL	6.09	1.38	1	1/5/2009	
1,2-Dichlorobenzene	BQL	6.09	1.57	1	1/5/2009	
1,3-Dichlorobenzene	BQL	6.09	1.56	1	1/5/2009	
1,4-Dichlorobenzene	BQL	6.09	1.28	1	1/5/2009	
trans-1,4-Dichloro-2-buten	BQL	30.5	1.68	1	1/5/2009	
1,1-Dichloroethane	BQL	6.09	1.29	1	1/5/2009	
1,1-Dichloroethene	BQL	6.09	1.80	1	1/5/2009	
1,2-Dichloroethane	BQL	6.09	1.61	1	1/5/2009	
cis-1,2-Dichloroethene	BQL	6.09	1.56	1	1/5/2009	
trans-1,2-Dichloroethene	BQL	6.09	1.38	1	1/5/2009	
1,2-Dichloropropane	BQL	6.09	1.44	1	1/5/2009	
1,3-Dichloropropane	BQL	6.09	1.37	1	1/5/2009	
2,2-Dichloropropane	BQL	6.09	1.46	1	1/5/2009	
1,1-Dichloropropene	BQL	6.09	1.91	1	1/5/2009	
cis-1,3-Dichloropropene	BQL	6.09	1.02	1	1/5/2009	
trans-1,3-Dichloropropene	BQL	6.09	1.17	1	1/5/2009	
Dichlorodifluoromethane	BQL	6.09	1.61	1	1/5/2009	
Ethylbenzene	BQL	6.09	1.06	1	1/5/2009	
Ethyl methacrylate	BQL	6.09	3.00	1	1/5/2009	
2-Hexanone	BQL	6.09	3.95	1	1/5/2009	
Isobutyl alcohol	BQL	6.09	512	1	1/5/2009	
Iodomethane	BQL	6.09	1.32	1	1/5/2009	

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260 Appendix II

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-685-1A
Lab Project ID: G175-685
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 12-31-2008 11:10
Date Received: 1/2/2009
Matrix: Soil
Sample Amount: 5.11 g
%Solids: 80.1

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	MDL UG/KG	Dilution Factor	Date Analyzed	Flag
Methacrylonitrile	BQL	6.09	27.2	1	1/5/2009	
Methylene chloride	BQL	24.4	1.45	1	1/5/2009	
Methyl methacrylate	BQL	6.09	2.51	1	1/5/2009	
4-Methyl-2-pentanone	BQL	6.09	5.64	1	1/5/2009	
Pentachloroethane	BQL	6.09	15.5	1	1/5/2009	
Propionitrile	BQL	1220	150	1	1/5/2009	
Styrene	BQL	6.09	1.34	1	1/5/2009	
1,1,1,2-Tetrachloroethane	BQL	6.09	1.24	1	1/5/2009	
1,1,2,2-Tetrachloroethane	BQL	6.09	1.38	1	1/5/2009	
Tetrachloroethene	BQL	6.09	1.12	1	1/5/2009	
Toluene	BQL	6.09	1.22	1	1/5/2009	
Trichloroethene	BQL	6.09	1.16	1	1/5/2009	
1,1,1-Trichloroethane	BQL	6.09	1.38	1	1/5/2009	
1,1,2-Trichloroethane	BQL	6.09	2.00	1	1/5/2009	
Trichlorofluoromethane	BQL	6.09	1.26	1	1/5/2009	
1,2,3-Trichloropropane	BQL	6.09	1.51	1	1/5/2009	
Vinyl acetate	BQL	15.2	1.57	1	1/5/2009	
Vinyl chloride	BQL	6.09	1.66	1	1/5/2009	
m/p-Xylene	BQL	12.2	2.34	1	1/5/2009	
o-Xylene	BQL	6.09	1.18	1	1/5/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	50	52.9	106
Toluene-d8	50	48	96
4-Bromofluorobenzene	50	41.7	83

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Analyst: _____

Reviewed By: _____

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260 Appendix II

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-685-2A
Lab Project ID: G175-685
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 12-31-2008 13:25
Date Received: 1/2/2009
Matrix: Soil
Sample Amount: 5.09 g
%Solids: 80.0

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	MDL UG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	61.4	8.48	1	1/5/2009	
Acetonitrile	BQL	1230	124	1	1/5/2009	
Acrolein	BQL	61.4	9.60	1	1/5/2009	
Acrylonitrile	BQL	61.4	14.7	1	1/5/2009	
Allyl chloride	BQL	6.14	2.07	1	1/5/2009	
Benzene	BQL	6.14	1.31	1	1/5/2009	
Bromochloromethane	BQL	6.14	2.11	1	1/5/2009	
Bromodichloromethane	BQL	6.14	1.22	1	1/5/2009	
Bromoform	BQL	6.14	1.23	1	1/5/2009	
Bromomethane	BQL	6.14	1.29	1	1/5/2009	
2-Butanone	BQL	30.7	6.66	1	1/5/2009	
Carbon disulfide	BQL	6.14	3.29	1	1/5/2009	
Carbon tetrachloride	BQL	6.14	1.25	1	1/5/2009	
Chlorobenzene	BQL	6.14	1.46	1	1/5/2009	
Chloroethane	BQL	6.14	1.95	1	1/5/2009	
2-Chloroethyl vinyl ether	BQL	6.14	8.69	1	1/5/2009	
Chloroform	BQL	6.14	1.47	1	1/5/2009	
Chloromethane	BQL	6.14	1.39	1	1/5/2009	
Chloroprene	BQL	6.14	1.40	1	1/5/2009	
Dibromochloromethane	BQL	6.14	1.69	1	1/5/2009	
1,2-Dibromo-3-chloropropan	BQL	30.7	1.78	1	1/5/2009	
Dibromomethane	BQL	6.14	1.85	1	1/5/2009	
1,2-Dibromoethane	BQL	6.14	1.39	1	1/5/2009	
1,2-Dichlorobenzene	BQL	6.14	1.58	1	1/5/2009	
1,3-Dichlorobenzene	BQL	6.14	1.57	1	1/5/2009	
1,4-Dichlorobenzene	BQL	6.14	1.29	1	1/5/2009	
trans-1,4-Dichloro-2-buten	BQL	30.7	1.69	1	1/5/2009	
1,1-Dichloroethane	BQL	6.14	1.30	1	1/5/2009	
1,1-Dichloroethene	BQL	6.14	1.82	1	1/5/2009	
1,2-Dichloroethane	BQL	6.14	1.62	1	1/5/2009	
cis-1,2-Dichloroethene	BQL	6.14	1.57	1	1/5/2009	
trans-1,2-Dichloroethene	BQL	6.14	1.39	1	1/5/2009	
1,2-Dichloropropane	BQL	6.14	1.45	1	1/5/2009	
1,3-Dichloropropane	BQL	6.14	1.37	1	1/5/2009	
2,2-Dichloropropane	BQL	6.14	1.47	1	1/5/2009	
1,1-Dichloropropene	BQL	6.14	1.93	1	1/5/2009	
cis-1,3-Dichloropropene	BQL	6.14	1.02	1	1/5/2009	
trans-1,3-Dichloropropene	BQL	6.14	1.18	1	1/5/2009	
Dichlorodifluoromethane	BQL	6.14	1.62	1	1/5/2009	
Ethylbenzene	BQL	6.14	1.06	1	1/5/2009	
Ethyl methacrylate	BQL	6.14	3.02	1	1/5/2009	
2-Hexanone	BQL	6.14	3.98	1	1/5/2009	
Isobutyl alcohol	BQL	6.14	515	1	1/5/2009	
Iodomethane	BQL	6.14	1.33	1	1/5/2009	

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260 Appendix II

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-685-2A
Lab Project ID: G175-685
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 12-31-2008 13:25
Date Received: 1/2/2009
Matrix: Soil
Sample Amount: 5.09 g
%Solids: 80.0

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	MDL UG/KG	Dilution Factor	Date Analyzed	Flag
Methacrylonitrile	BQL	6.14	27.4	1	1/5/2009	
Methylene chloride	**1.69**	24.5	1.46	1	1/5/2009	J
Methyl methacrylate	BQL	6.14	2.53	1	1/5/2009	
4-Methyl-2-pentanone	BQL	6.14	5.68	1	1/5/2009	
Pentachloroethane	BQL	6.14	15.6	1	1/5/2009	
Propionitrile	BQL	1230	151	1	1/5/2009	
Styrene	BQL	6.14	1.35	1	1/5/2009	
1,1,1,2-Tetrachloroethane	BQL	6.14	1.25	1	1/5/2009	
1,1,2,2-Tetrachloroethane	BQL	6.14	1.39	1	1/5/2009	
Tetrachloroethene	BQL	6.14	1.12	1	1/5/2009	
Toluene	BQL	6.14	1.22	1	1/5/2009	
Trichloroethene	BQL	6.14	1.17	1	1/5/2009	
1,1,1-Trichloroethane	BQL	6.14	1.39	1	1/5/2009	
1,1,2-Trichloroethane	BQL	6.14	2.01	1	1/5/2009	
Trichlorofluoromethane	BQL	6.14	1.26	1	1/5/2009	
1,2,3-Trichloropropane	BQL	6.14	1.52	1	1/5/2009	
Vinyl acetate	BQL	15.3	1.58	1	1/5/2009	
Vinyl chloride	BQL	6.14	1.67	1	1/5/2009	
m/p-Xylene	BQL	12.3	2.36	1	1/5/2009	
o-Xylene	BQL	6.14	1.19	1	1/5/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	50	54.5	109
Toluene-d8	50	47.9	96
4-Bromofluorobenzene	50	39	78

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Analyst: _____ Reviewed By: _____

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260 Appendix II

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-685-3A
Lab Project ID: G175-685
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 12-31-2008 11:45
Date Received: 1/2/2009
Matrix: Soil
Sample Amount: 5.05 g
%Solids: 77.6

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	MDL UG/KG	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	63.7	8.80	1	1/5/2009	
Acetonitrile	BQL	1270	129	1	1/5/2009	
Acrolein	BQL	63.7	9.96	1	1/5/2009	
Acrylonitrile	BQL	63.7	15.3	1	1/5/2009	
Allyl chloride	BQL	6.37	2.15	1	1/5/2009	
Benzene	BQL	6.37	1.36	1	1/5/2009	
Bromochloromethane	BQL	6.37	2.19	1	1/5/2009	
Bromodichloromethane	BQL	6.37	1.26	1	1/5/2009	
Bromoform	BQL	6.37	1.27	1	1/5/2009	
Bromomethane	BQL	6.37	1.34	1	1/5/2009	
2-Butanone	BQL	31.8	6.92	1	1/5/2009	
Carbon disulfide	BQL	6.37	3.41	1	1/5/2009	
Carbon tetrachloride	BQL	6.37	1.30	1	1/5/2009	
Chlorobenzene	BQL	6.37	1.52	1	1/5/2009	
Chloroethane	BQL	6.37	2.03	1	1/5/2009	
2-Chloroethyl vinyl ether	BQL	6.37	9.02	1	1/5/2009	
Chloroform	BQL	6.37	1.53	1	1/5/2009	
Chloromethane	BQL	6.37	1.44	1	1/5/2009	
Chloroprene	BQL	6.37	1.45	1	1/5/2009	
Dibromochloromethane	BQL	6.37	1.76	1	1/5/2009	
1,2-Dibromo-3-chloropropan	BQL	31.8	1.85	1	1/5/2009	
Dibromomethane	BQL	6.37	1.92	1	1/5/2009	
1,2-Dibromoethane	BQL	6.37	1.44	1	1/5/2009	
1,2-Dichlorobenzene	BQL	6.37	1.64	1	1/5/2009	
1,3-Dichlorobenzene	BQL	6.37	1.63	1	1/5/2009	
1,4-Dichlorobenzene	BQL	6.37	1.34	1	1/5/2009	
trans-1,4-Dichloro-2-buten	BQL	31.8	1.76	1	1/5/2009	
1,1-Dichloroethane	BQL	6.37	1.35	1	1/5/2009	
1,1-Dichloroethene	BQL	6.37	1.89	1	1/5/2009	
1,2-Dichloroethane	BQL	6.37	1.68	1	1/5/2009	
cis-1,2-Dichloroethene	BQL	6.37	1.63	1	1/5/2009	
trans-1,2-Dichloroethene	BQL	6.37	1.44	1	1/5/2009	
1,2-Dichloropropane	BQL	6.37	1.50	1	1/5/2009	
1,3-Dichloropropane	BQL	6.37	1.43	1	1/5/2009	
2,2-Dichloropropane	BQL	6.37	1.53	1	1/5/2009	
1,1-Dichloropropene	BQL	6.37	2.00	1	1/5/2009	
cis-1,3-Dichloropropene	BQL	6.37	1.06	1	1/5/2009	
trans-1,3-Dichloropropene	BQL	6.37	1.23	1	1/5/2009	
Dichlorodifluoromethane	BQL	6.37	1.68	1	1/5/2009	
Ethylbenzene	BQL	6.37	1.10	1	1/5/2009	
Ethyl methacrylate	BQL	6.37	3.13	1	1/5/2009	
2-Hexanone	BQL	6.37	4.13	1	1/5/2009	
Isobutyl alcohol	BQL	6.37	535	1	1/5/2009	
Iodomethane	BQL	6.37	1.38	1	1/5/2009	

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260 Appendix II

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-685-3A
Lab Project ID: G175-685
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 12-31-2008 11:45
Date Received: 1/2/2009
Matrix: Soil
Sample Amount: 5.05 g
%Solids: 77.6

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	MDL UG/KG	Dilution Factor	Date Analyzed	Flag
Methacrylonitrile	BQL	6.37	28.4	1	1/5/2009	
Methylene chloride	BQL	25.5	1.52	1	1/5/2009	
Methyl methacrylate	BQL	6.37	2.62	1	1/5/2009	
4-Methyl-2-pentanone	BQL	6.37	5.90	1	1/5/2009	
Pentachloroethane	BQL	6.37	16.2	1	1/5/2009	
Propionitrile	BQL	1270	157	1	1/5/2009	
Styrene	BQL	6.37	1.40	1	1/5/2009	
1,1,1,2-Tetrachloroethane	BQL	6.37	1.30	1	1/5/2009	
1,1,2,2-Tetrachloroethane	BQL	6.37	1.44	1	1/5/2009	
Tetrachloroethene	BQL	6.37	1.17	1	1/5/2009	
Toluene	BQL	6.37	1.27	1	1/5/2009	
Trichloroethene	BQL	6.37	1.22	1	1/5/2009	
1,1,1-Trichloroethane	BQL	6.37	1.44	1	1/5/2009	
1,1,2-Trichloroethane	BQL	6.37	2.09	1	1/5/2009	
Trichlorofluoromethane	BQL	6.37	1.31	1	1/5/2009	
1,2,3-Trichloropropane	BQL	6.37	1.58	1	1/5/2009	
Vinyl acetate	BQL	15.9	1.64	1	1/5/2009	
Vinyl chloride	BQL	6.37	1.73	1	1/5/2009	
m/p-Xylene	BQL	12.7	2.45	1	1/5/2009	
o-Xylene	BQL	6.37	1.23	1	1/5/2009	

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	50	53.7	107
Toluene-d8	50	48.8	98
4-Bromofluorobenzene	50	39.6	79

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Analyst: _____ Reviewed By: _____

Results for Metals

Client Sample ID:	S1	Analyzed By:	PSW DCP
Client Project ID:	N Wake Leachate Pond at Lined Landfill	Date Collected:	12/31/2008 11:10
Lab Sample ID:	G175-685-1	Date Received:	1/2/2009
Lab Project ID:	G175-685	Matrix:	SOIL
ICP InitWt/Vol:	0.5 g Final Vol: 50 mL	Solids	80.12
Hg InitWt/Vol:	0.53 g Final Vol: 50 mL	Report Basis:	Dry
Prep Batch:	13371 13380		

Metals	Result	SWSL	MDL	DF	Units	Method	Date Analyzed	Flags
Antimony	BQL	0.749	1.13	1	MG/KG	6010B	1/6/2009	
Arsenic	**3.64**	1.25	0.999	1	MG/KG	6010B	1/6/2009	
Barium	**66.8**	12.5	0.588	1	MG/KG	6010B	1/5/2009	
Beryllium	**1.31**	0.125	0.874	1	MG/KG	6010B	1/6/2009	
Cadmium	BQL	0.125	0.0151	10	MG/KG	6020	1/7/2009	
Chromium	**32.5**	1.25	0.137	1	MG/KG	6010B	1/5/2009	
Cobalt	**14.7**	1.25	0.343	1	MG/KG	6010B	1/6/2009	
Copper	**54.7**	1.25	0.225	1	MG/KG	6010B	1/5/2009	B
Lead	**15.0**	1.25	0.801	1	MG/KG	6010B	1/5/2009	
Mercury	**0.0547**	0.0235	0.00135	1	MG/KG	7471	1/6/2009	
Nickel	**15.2**	6.24	0.750	1	MG/KG	6010B	1/6/2009	
Selenium	**12.7**	1.25	0.909	1	MG/KG	6010B	1/6/2009	
Silver	BQL	1.25	0.110	1	MG/KG	6010B	1/5/2009	
Thallium	BQL	0.686	1.10	1	MG/KG	6010B	1/5/2009	
Tin	BQL	12.5	0.468	1	MG/KG	6010B	1/7/2009	
Vanadium	**120**	31.2	0.374	100	MG/KG	6020	1/7/2009	
Zinc	**41.7**	1.25	0.401	1	MG/KG	6010B	1/5/2009	

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By:
METALS.XLS

Results for Metals

Client Sample ID:	S2	Analyzed By:	PSW DCP
Client Project ID:	N Wake Leachate Pond at Lined Landfill	Date Collected:	12/31/2008 13:25
Lab Sample ID:	G175-685-2	Date Received:	1/2/2009
Lab Project ID:	G175-685	Matrix:	SOIL
ICP InitWt/Vol:	0.58 g Final Vol: 50 mL	Solids	80.04
Hg InitWt/Vol:	0.53 g Final Vol: 50 mL	Report Basis:	Dry
Prep Batch:	13371 13380		

Metals	Result	SWSL	MDL	DF	Units	Method	Date Analyzed	Flags
Antimony	BQL	0.646	0.975	1	MG/KG	6010B	1/6/2009	
Arsenic	**5.94**	1.08	0.862	1	MG/KG	6010B	1/6/2009	
Barium	**61.7**	10.8	0.507	1	MG/KG	6010B	1/5/2009	
Beryllium	BQL	0.108	0.754	1	MG/KG	6010B	1/6/2009	
Cadmium	BQL	0.108	0.0130	10	MG/KG	6020	1/7/2009	
Chromium	**40.8**	1.08	0.118	1	MG/KG	6010B	1/5/2009	
Cobalt	**11.9**	1.08	0.296	1	MG/KG	6010B	1/6/2009	
Copper	**50.5**	1.08	0.194	1	MG/KG	6010B	1/5/2009	B
Lead	**12.9**	1.08	0.691	1	MG/KG	6010B	1/5/2009	
Mercury	**0.0578**	0.0236	0.00136	1	MG/KG	7471	1/6/2009	
Nickel	**18.7**	5.39	0.647	1	MG/KG	6010B	1/6/2009	
Selenium	**11.1**	1.08	0.784	1	MG/KG	6010B	1/6/2009	
Silver	BQL	1.08	0.0947	1	MG/KG	6010B	1/5/2009	
Thallium	BQL	0.592	0.948	1	MG/KG	6010B	1/5/2009	
Tin	BQL	10.8	0.404	1	MG/KG	6010B	1/7/2009	
Vanadium	**110**	26.9	0.323	100	MG/KG	6020	1/7/2009	
Zinc	**40.2**	1.08	0.346	1	MG/KG	6010B	1/5/2009	

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By: _____
METALS.XLS

Results for Metals

Client Sample ID:	S3	Analyzed By:	PSW DCP
Client Project ID:	N Wake Leachate Pond at Lined Landfill	Date Collected:	12/31/2008 11:45
Lab Sample ID:	G175-685-3	Date Received:	1/2/2009
Lab Project ID:	G175-685	Matrix:	SOIL
ICP InitWt/Vol:	0.53 g Final Vol: 50 mL	Solids	77.57
Hg InitWt/Vol:	0.52 g Final Vol: 50 mL	Report Basis:	Dry
Prep Batch:	13371 13380		

Metals	Result	SWSL	MDL	DF	Units	Method	Date Analyzed	Flags
Antimony	BQL	0.730	1.10	1	MG/KG	6010B	1/6/2009	
Arsenic	**4.67**	1.22	0.973	1	MG/KG	6010B	1/6/2009	
Barium	**54.9**	12.2	0.573	1	MG/KG	6010B	1/5/2009	
Beryllium	BQL	0.122	0.851	1	MG/KG	6010B	1/6/2009	
Cadmium	BQL	0.122	0.0147	10	MG/KG	6020	1/7/2009	
Chromium	**45.0**	1.22	0.134	1	MG/KG	6010B	1/5/2009	
Cobalt	**12.5**	1.22	0.334	1	MG/KG	6010B	1/6/2009	
Copper	**54.3**	1.22	0.219	1	MG/KG	6010B	1/5/2009	B
Lead	**14.4**	1.22	0.781	1	MG/KG	6010B	1/5/2009	
Mercury	**0.0511**	0.0248	0.00143	1	MG/KG	7471	1/6/2009	
Nickel	**16.0**	6.08	0.731	1	MG/KG	6010B	1/6/2009	
Selenium	**12.4**	1.22	0.885	1	MG/KG	6010B	1/6/2009	
Silver	BQL	1.22	0.107	1	MG/KG	6010B	1/5/2009	
Thallium	**2.01**	0.669	1.07	1	MG/KG	6010B	1/5/2009	
Tin	BQL	12.2	0.456	1	MG/KG	6010B	1/7/2009	
Vanadium	**118**	30.4	0.365	100	MG/KG	6020	1/7/2009	
Zinc	**40.0**	1.22	0.390	1	MG/KG	6010B	1/5/2009	

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By:
METALS.XLS

Results for Pesticides
by EPA 8081

Client Sample ID: S1 Analyzed By: EAW
Client Project ID: N Wake Leachate Pond at Lined Landfill Date Collected: 12/31/2008 11:10
Lab Sample ID: G175-685-1H Date Received: 1/2/2009
Lab Project ID: G175-685 Date Extracted: 1/5/2009
Sample Wt/Vol: 32.95 g ColumnID: STX_CLPest Matrix: Soil
Report Basis: Dry Weight % Solids: 80.1

Compound	Result ug/KG	RL ug/KG	MDL ug/KG	Dilution Factor	Date Analyzed	Flags
alpha-BHC	BQL	11.4	1.03	1.0	1/6/2009	
beta-BHC	BQL	11.4	1.15	1.0	1/6/2009	
delta-BHC	BQL	11.4	1.06	1.0	1/6/2009	
gamma-BHC (Lindane)	BQL	11.4	1.06	1.0	1/6/2009	
Heptachlor	BQL	11.4	1.09	1.0	1/6/2009	
Aldrin	BQL	11.4	1.05	1.0	1/6/2009	
Heptachlor epoxide	BQL	11.4	1.05	1.0	1/6/2009	
Endosulfan I	BQL	11.4	1.04	1.0	1/6/2009	
Dieldrin	BQL	11.4	0.966	1.0	1/6/2009	
4,4'-DDE	BQL	11.4	1.02	1.0	1/6/2009	
Endrin	BQL	11.4	0.962	1.0	1/6/2009	
DDD	BQL	11.4	0.939	1.0	1/6/2009	
Endosulfan II	BQL	11.4	1.09	1.0	1/6/2009	
4,4'-DDT	BQL	11.4	1.00	1.0	1/6/2009	
Methoxychlor	BQL	11.4	1.28	1.0	1/6/2009	
Toxaphene	BQL	37.9	7.42	1.0	1/6/2009	
alpha-Chlordane	BQL	11.4	0.992	1.0	1/6/2009	
gamma-Chlordane	BQL	11.4	1.03	1.0	1/6/2009	
Chlordane, Total	BQL	18.9	10.8	1.0	1/6/2009	
Endrin aldehyde	BQL	11.4	1.45	1.0	1/6/2009	
Endosulfan sulfate	BQL	11.4	1.18	1.0	1/6/2009	
Endrin ketone	BQL	11.4	1.14	1.0	1/6/2009	

	Spike Added	Spike Result	Percent Recovered
TCMX	100	55.8	55.8
DBC	100	56.2	56.2

Comments:
BQL = Below Quantitation Limit

Reviewed By:

8081

SGS Environmental Services, Inc.

Results for Pesticides
by EPA 8081

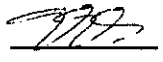
Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfil
Lab Sample ID: G175-685-2F
Lab Project ID: G175-685
Sample Wt/Vol: 32.06 g ColumnID: STX_CLPest
Report Basis: Dry Weight

Analyzed By: EAW
Date Collected: 12/31/2008 13:25
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.0

Compound	Result ug/KG	RL ug/KG	MDL ug/KG	Dilution Factor	Date Analyzed	Flags
alpha-BHC	BQL	11.7	1.06	1.0	1/6/2009	
beta-BHC	BQL	11.7	1.18	1.0	1/6/2009	
delta-BHC	BQL	11.7	1.10	1.0	1/6/2009	
gamma-BHC (Lindane)	BQL	11.7	1.10	1.0	1/6/2009	
Heptachlor	BQL	11.7	1.12	1.0	1/6/2009	
Aldrin	BQL	11.7	1.08	1.0	1/6/2009	
Heptachlor epoxide	BQL	11.7	1.08	1.0	1/6/2009	
Endosulfan I	BQL	11.7	1.07	1.0	1/6/2009	
Dieldrin	BQL	11.7	0.994	1.0	1/6/2009	
4,4'-DDE	BQL	11.7	1.05	1.0	1/6/2009	
Endrin	BQL	11.7	0.990	1.0	1/6/2009	
DDD	BQL	11.7	0.966	1.0	1/6/2009	
Endosulfan II	BQL	11.7	1.12	1.0	1/6/2009	
4,4'-DDT	1.11	11.7	1.03	1.0	1/6/2009	J
Methoxychlor	BQL	11.7	1.32	1.0	1/6/2009	
Toxaphene	BQL	39.0	7.64	1.0	1/6/2009	
alpha-Chlordane	BQL	11.7	1.02	1.0	1/6/2009	
gamma-Chlordane	BQL	11.7	1.06	1.0	1/6/2009	
Chlordane, Total	BQL	19.5	11.1	1.0	1/6/2009	
Endrin aldehyde	BQL	11.7	1.50	1.0	1/6/2009	
Endosulfan sulfate	BQL	11.7	1.22	1.0	1/6/2009	
Endrin ketone	BQL	11.7	1.17	1.0	1/6/2009	

	Spike Added	Spike Result	Percent Recovered
TCMX	100	54.5	54.5
DBC	100	54.8	54.8

Comments:
BQL = Below Quantitation Limit

Reviewed By: 

8081

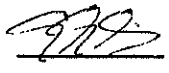
Results for Pesticides
by EPA 8081

Client Sample ID: S3 Analyzed By: EAW
Client Project ID: N Wake Leachate Pond at Lined Landfill Date Collected: 12/31/2008 11:45
Lab Sample ID: G175-685-3F Date Received: 1/2/2009
Lab Project ID: G175-685 Date Extracted: 1/5/2009
Sample Wt/Vol: 33.04 g ColumnID: STX_CLPest Matrix: Soil
Report Basis: Dry Weight % Solids: 77.6

Compound	Result ug/KG	RL ug/KG	MDL ug/KG	Dilution Factor	Date Analyzed	Flags
alpha-BHC	BQL	11.7	1.06	1.0	1/5/2009	
beta-BHC	BQL	11.7	1.18	1.0	1/5/2009	
delta-BHC	BQL	11.7	1.10	1.0	1/5/2009	
gamma-BHC (Lindane)	BQL	11.7	1.10	1.0	1/5/2009	
Heptachlor	BQL	11.7	1.12	1.0	1/5/2009	
Aldrin	BQL	11.7	1.08	1.0	1/5/2009	
Heptachlor epoxide	BQL	11.7	1.08	1.0	1/5/2009	
Endosulfan I	BQL	11.7	1.07	1.0	1/5/2009	
Dieldrin	BQL	11.7	0.995	1.0	1/5/2009	
4,4'-DDE	BQL	11.7	1.05	1.0	1/5/2009	
Endrin	BQL	11.7	0.991	1.0	1/5/2009	
DDD	BQL	11.7	0.968	1.0	1/5/2009	
Endosulfan II	BQL	11.7	1.12	1.0	1/5/2009	
4,4'-DDT	BQL	11.7	1.03	1.0	1/5/2009	
Methoxychlor	BQL	11.7	1.32	1.0	1/5/2009	
Toxaphene	BQL	39.0	7.65	1.0	1/5/2009	
alpha-Chlordane	BQL	11.7	1.02	1.0	1/5/2009	
gamma-Chlordane	BQL	11.7	1.06	1.0	1/5/2009	
Chlordane, Total	BQL	19.5	11.1	1.0	1/5/2009	
Endrin aldehyde	BQL	11.7	1.50	1.0	1/5/2009	
Endosulfan sulfate	BQL	11.7	1.22	1.0	1/5/2009	
Endrin ketone	BQL	11.7	1.17	1.0	1/5/2009	

	Spike Added	Spike Result	Percent Recovered
TCMX	100	55.0	55.0
DBC	100	54.6	54.6

Comments:
BQL = Below Quantitation Limit

Reviewed By: 

8081

SGS Environmental Services, Inc.

Results for Herbicides
by EPA 8151

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-1R
Lab Project ID: G175-685
Sample Wt/Vol: 32.12 g
Report Basis: Dry Weight

Analyzed By: ALT
Date Collected: 12/31/2008 11:10
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.1

Compound	Result ug/KG	Quantitation Limit ug/KG	MDL ug/KG	Dilution Factor	Date Analyzed	Flag
2,4-D	BQL	38.8	3.03	1	1/8/2009	
2,4,5-TP(Silvex)	BQL	38.8	3.61	1	1/8/2009	
2,4,5-T	BQL	38.8	2.34	1	1/8/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered	Limits
DCAA	2.0	1.75	87	35-135

Comments:
BQL = Below Quantitation Limit
Column IDs: RTX_CLPesticides / RTX_CLPesticides2

Reviewed By:

8151.XLS

Results for Herbicides
by EPA 8151

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-2M
Lab Project ID: G175-685
Sample Wt/Vol: 32.71 g
Report Basis: Dry Weight

Analyzed By: ALT
Date Collected: 12/31/2008 13:25
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.0

Compound	Result ug/KG	Quantitation Limit ug/KG	MDL ug/KG	Dilution Factor	Date Analyzed	Flag
2,4-D	BQL	38.2	2.98	1	1/8/2009	
2,4,5-TP(Silvex)	BQL	38.2	3.54	1	1/8/2009	
2,4,5-T	BQL	38.2	2.30	1	1/8/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered	Limits
DCAA	2.0	1.41	70	35-135

Comments:
BQL = Below Quantitation Limit
Column IDs: RTX_CLPesticides / RTX_CLPesticides2

Reviewed By:

SGS Environmental Services, Inc.

Results for Herbicides
by EPA 8151

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-3M
Lab Project ID: G175-685
Sample Wt/Vol: 32.98 g
Report Basis: Dry Weight

Analyzed By: ALT
Date Collected: 12/31/2008 11:45
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 77.6

Compound	Result ug/KG	Quantitation Limit ug/KG	MDL ug/KG	Dilution Factor	Date Analyzed	Flag
2,4-D	BQL	39.1	3.05	1	1/8/2009	
2,4,5-TP(Silvex)	BQL	39.1	3.63	1	1/8/2009	
2,4,5-T	BQL	39.1	2.35	1	1/8/2009	

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered	Limits
DCAA	2.0	1.26	63	35-135

Comments:
BQL = Below Quantitation Limit
Column IDs: RTX_CLPesticides / RTX_CLPesticides2

Reviewed By:

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-1M
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 32.8 g

Analyzed By: DCS
Date Collected: 12/31/2008 11:10
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.12

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	381	58.2	1	1/7/2009	
Acenaphthylene	BQL	381	53.3	1	1/7/2009	
Acetophenone	BQL	381	59.4	1	1/7/2009	
2-Acetylaminofluorene	BQL	761	53.3	1	1/7/2009	
4-Aminobiphenyl	BQL	381	42.6	1	1/7/2009	
Aniline	BQL	381	60.9	1	1/7/2009	
Anthracene	BQL	381	51.8	1	1/7/2009	
Aramite	BQL	381	81.1	1	1/7/2009	
Benzidine	BQL	761	111	1	1/7/2009	
Benzo[a]anthracene	BQL	381	52.1	1	1/7/2009	
Benzo[a]pyrene	BQL	381	54.8	1	1/7/2009	
Benzo[b]fluoranthene	BQL	381	52.9	1	1/7/2009	
Benzo[g,h,i]perylene	BQL	381	66.2	1	1/7/2009	
Benzo[k]fluoranthene	BQL	381	54.0	1	1/7/2009	
Benzyl Alcohol	BQL	761	68.5	1	1/7/2009	
Bis(2-chloroethoxy)methane	BQL	381	55.9	1	1/7/2009	
Bis(2-chloroethyl)ether	BQL	381	77.2	1	1/7/2009	
Bis(2-chloroisopropyl)ether	BQL	381	61.3	1	1/7/2009	
Bis(2-ethylhexyl)phthalate	BQL	381	58.2	1	1/7/2009	
4-Bromophenyl phenyl ether	BQL	381	67.4	1	1/7/2009	
Butylbenzylphthalate	BQL	381	56.3	1	1/7/2009	
Chlorobenzilate	BQL	381	47.2	1	1/7/2009	
2-Chloronaphthalene	BQL	381	52.9	1	1/7/2009	
2-Chlorophenol	BQL	381	48.3	1	1/7/2009	
4-Chloro-3-methylphenol	BQL	381	55.6	1	1/7/2009	
4-Chloroaniline	BQL	381	62.0	1	1/7/2009	
4-Chlorophenyl phenyl ether	BQL	381	55.9	1	1/7/2009	
Chrysene	BQL	381	36.5	1	1/7/2009	
Diallate	BQL	381	247	1	1/7/2009	
Dibenz[a,j]acridine	BQL	381	293	1	1/7/2009	
Dibenzo[a,h]anthracene	BQL	381	48.7	1	1/7/2009	
Dibenzofuran	BQL	381	53.7	1	1/7/2009	
Di-n-Butylphthalate	BQL	381	55.6	1	1/7/2009	
1,2-Dichlorobenzene	BQL	381	64.3	1	1/7/2009	
1,3-Dichlorobenzene	BQL	381	61.6	1	1/7/2009	
1,4-Dichlorobenzene	BQL	381	55.2	1	1/7/2009	
3,3'-Dichlorobenzidine	BQL	761	62.8	1	1/7/2009	
2,4-Dichlorophenol	BQL	381	41.5	1	1/7/2009	
2,6-Dichlorophenol	BQL	381	52.9	1	1/7/2009	
Diethylphthalate	BQL	381	51.0	1	1/7/2009	
Dimethoate	BQL	381	57.5	1	1/7/2009	
3,3'-Dimethylbenzidine	BQL	1900	850	1	1/7/2009	
a,a-Dimethylphenethylamine	BQL	1900	761	1	1/7/2009	
Dimethylphthalate	BQL	381	59.0	1	1/7/2009	
p-Dimethylaminoazobenzene	BQL	381	51.4	1	1/7/2009	
7,12-Dimethylbenz[a]anthracene	BQL	381	183	1	1/7/2009	
2,4-Dimethylphenol	BQL	381	68.9	1	1/7/2009	

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-1M
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 32.8 g

Analyzed By: DCS
Date Collected: 12/31/2008 11:10
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.12

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
Di-n-octylphthalate	126	381	58.6	1	1/7/2009	J
4,6-Dinitro-2-methylphenol	BQL	1900	45.3	1	1/7/2009	
m-Dinitrobenzene	BQL	381	92.8	1	1/7/2009	
2,4-Dinitrophenol	BQL	1900	49.5	1	1/7/2009	
2,4-Dinitrotoluene	BQL	381	57.8	1	1/7/2009	
2,6-Dinitrotoluene	BQL	381	62.8	1	1/7/2009	
Dinoseb	BQL	1900	38.4	1	1/7/2009	
Diphenylamine *	BQL	381	47.9	1	1/7/2009	
Disulfoton	BQL	381	99.7	1	1/7/2009	
Ethylmethanesulfonate	BQL	381	52.5	1	1/7/2009	
Famphur	BQL	1900	66.6	1	1/7/2009	
Fluoranthene	BQL	381	61.3	1	1/7/2009	
Fluorene	BQL	381	59.4	1	1/7/2009	
Hexachlorobenzene	BQL	1900	82.6	1	1/7/2009	
Hexachlorobutadiene	BQL	381	69.3	1	1/7/2009	
Hexachlorocyclopentadiene	BQL	761	74.2	1	1/7/2009	
Hexachloroethane	BQL	381	59.4	1	1/7/2009	
Hexachlorophene	BQL	381	174	1	1/7/2009	
Hexachloropropene	BQL	761	60.9	1	1/7/2009	
Indeno(1,2,3-c,d)pyrene	BQL	381	44.9	1	1/7/2009	
Isodrin	BQL	381	53.3	1	1/7/2009	
Isophorone	BQL	381	55.6	1	1/7/2009	
Isosafrole	BQL	381	59.0	1	1/7/2009	
Kepone	BQL	1900	1900	1	1/7/2009	
Methapyrilene	BQL	381	381	1	1/7/2009	
Methyl parathion	BQL	381	161	1	1/7/2009	
Methylmethanesulfonate	BQL	381	54.0	1	1/7/2009	
2-Methylnaphthalene	BQL	381	62.0	1	1/7/2009	
2-Methylphenol	BQL	381	58.2	1	1/7/2009	
3- & 4-Methylphenol	BQL	381	49.5	1	1/7/2009	
3-Methylcholanthrene	BQL	381	47.2	1	1/7/2009	
Naphthalene	BQL	381	53.3	1	1/7/2009	
1,4-Naphthoquinone	BQL	381	70.4	1	1/7/2009	
1-Naphthylamine	BQL	1900	55.2	1	1/7/2009	
2-Naphthylamine	BQL	1900	32.7	1	1/7/2009	
5-Nitro-o-toluidine	BQL	381	55.2	1	1/7/2009	
2-Nitroaniline	BQL	381	51.0	1	1/7/2009	
3-Nitroaniline	BQL	1900	55.9	1	1/7/2009	
4-Nitroaniline	BQL	1900	51.0	1	1/7/2009	
Nitrobenzene	BQL	381	50.6	1	1/7/2009	
2-Nitrophenol	BQL	381	55.6	1	1/7/2009	
4-Nitrophenol	BQL	1900	66.2	1	1/7/2009	
4-Nitroquinoline-1-oxide	BQL	1900	152	1	1/7/2009	
N-Nitroso-di-n-butylamine	BQL	381	46.8	1	1/7/2009	
N-Nitrosodi-n-propylamine	BQL	381	61.3	1	1/7/2009	
N-Nitrosodiethylamine	BQL	381	53.3	1	1/7/2009	
N-Nitrosodimethylamine	BQL	381	56.7	1	1/7/2009	

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-1M
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 32.8 g

Analyzed By: DCS
Date Collected: 12/31/2008 11:10
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.12

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
N-Nitrosomethylethylamine	BQL	381	67.7	1	1/7/2009	
N-Nitrosomorpholine	BQL	381	61.3	1	1/7/2009	
N-Nitrosopiperidine	BQL	381	53.7	1	1/7/2009	
N-Nitrosopyrrolidine	BQL	381	235	1	1/7/2009	
Parathion	BQL	761	90.2	1	1/7/2009	
Pentachlorobenzene	BQL	381	53.3	1	1/7/2009	
Pentachloronitrobenzene	BQL	381	54.8	1	1/7/2009	
Pentachlorophenol	BQL	1900	35.0	1	1/7/2009	
Phenacetin	BQL	381	72.3	1	1/7/2009	
Phenanthrene	BQL	381	53.3	1	1/7/2009	
Phenol	BQL	381	51.8	1	1/7/2009	
p-Phenylenediamine	BQL	761	520	1	1/7/2009	
Phorate	BQL	761	66.6	1	1/7/2009	
2-Piccoline	BQL	381	67.7	1	1/7/2009	
Pronamide	BQL	381	59.4	1	1/7/2009	
Pyrene	BQL	381	51.8	1	1/7/2009	
Pyridine	BQL	381	129	1	1/7/2009	
Safrole	BQL	381	57.8	1	1/7/2009	
Sulfotep	BQL	381	94.4	1	1/7/2009	
1,2,4,5-Tetrachlorobenzene	BQL	381	52.9	1	1/7/2009	
2,3,4,6-Tetrachlorophenol	BQL	381	63.5	1	1/7/2009	
Thionazin	BQL	761	220	1	1/7/2009	
o-Toluidine	BQL	381	75.3	1	1/7/2009	
1,2,4-Trichlorobenzene	BQL	381	68.5	1	1/7/2009	
2,4,5-Trichlorophenol	BQL	381	56.7	1	1/7/2009	
2,4,6-Trichlorophenol	BQL	381	33.9	1	1/7/2009	
O,O,O-Triethylphosphorothioate	BQL	381	183	1	1/7/2009	
1,3,5-Trinitrobenzene	BQL	1900	68.5	1	1/7/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	10	100
2-Fluorophenol	10	9.7	97
Nitrobenzene-d5	10	10.4	104
Phenol-d6	10	10.4	104
2,4,6-Tribromophenol	10	9.5	94
4-Terphenyl-d14	10	8.6	86

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

SGS Environmental Services, Inc.

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-2H
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 33.69 g

Analyzed By: DCS
Date Collected: 12/31/2008 13:25
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.04

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	371	56.7	1	1/7/2009	
Acenaphthylene	BQL	371	51.9	1	1/7/2009	
Acetophenone	BQL	371	57.9	1	1/7/2009	
2-Acetylaminofluorene	BQL	742	51.9	1	1/7/2009	
4-Aminobiphenyl	BQL	371	41.5	1	1/7/2009	
Aniline	BQL	371	59.3	1	1/7/2009	
Anthracene	BQL	371	50.4	1	1/7/2009	
Aramite	BQL	371	79.0	1	1/7/2009	
Benzidine	BQL	742	108	1	1/7/2009	
Benzo[a]anthracene	BQL	371	50.8	1	1/7/2009	
Benzo[a]pyrene	BQL	371	53.4	1	1/7/2009	
Benzo[b]fluoranthene	BQL	371	51.5	1	1/7/2009	
Benzo[g,h,i]perylene	BQL	371	64.5	1	1/7/2009	
Benzo[k]fluoranthene	BQL	371	52.7	1	1/7/2009	
Benzyl Alcohol	BQL	742	66.8	1	1/7/2009	
Bis(2-chloroethoxy)methane	BQL	371	54.5	1	1/7/2009	
Bis(2-chloroethyl)ether	BQL	371	75.3	1	1/7/2009	
Bis(2-chloroisopropyl)ether	BQL	371	59.7	1	1/7/2009	
Bis(2-ethylhexyl)phthalate	BQL	371	56.7	1	1/7/2009	
4-Bromophenyl phenyl ether	BQL	371	65.6	1	1/7/2009	
Butylbenzylphthalate	BQL	371	54.9	1	1/7/2009	
Chlorobenzilate	BQL	371	46.0	1	1/7/2009	
2-Chloronaphthalene	BQL	371	51.5	1	1/7/2009	
2-Chlorophenol	BQL	371	47.1	1	1/7/2009	
4-Chloro-3-methylphenol	BQL	371	54.1	1	1/7/2009	
4-Chloroaniline	BQL	371	60.4	1	1/7/2009	
4-Chlorophenyl phenyl ether	BQL	371	54.5	1	1/7/2009	
Chrysene	BQL	371	35.6	1	1/7/2009	
Diallate	BQL	371	241	1	1/7/2009	
Dibenz[a,j]acridine	BQL	371	286	1	1/7/2009	
Dibenzo[a,h]anthracene	BQL	371	47.5	1	1/7/2009	
Dibenzofuran	BQL	371	52.3	1	1/7/2009	
Di-n-Butylphthalate	BQL	371	54.1	1	1/7/2009	
1,2-Dichlorobenzene	BQL	371	62.7	1	1/7/2009	
1,3-Dichlorobenzene	BQL	371	60.1	1	1/7/2009	
1,4-Dichlorobenzene	BQL	371	53.8	1	1/7/2009	
3,3'-Dichlorobenzidine	BQL	742	61.2	1	1/7/2009	
2,4-Dichlorophenol	BQL	371	40.4	1	1/7/2009	
2,6-Dichlorophenol	BQL	371	51.5	1	1/7/2009	
Diethylphthalate	BQL	371	49.7	1	1/7/2009	
Dimethoate	BQL	371	56.0	1	1/7/2009	
3,3'-Dimethylbenzidine	BQL	1850	828	1	1/7/2009	
a,a-Dimethylphenethylamine	BQL	1850	742	1	1/7/2009	
Dimethylphthalate	BQL	371	57.5	1	1/7/2009	
p-Dimethylaminoazobenzene	BQL	371	50.1	1	1/7/2009	
7,12-Dimethylbenz[a]anthracene	BQL	371	178	1	1/7/2009	
2,4-Dimethylphenol	BQL	371	67.1	1	1/7/2009	

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-2H
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 33.69 g

Analyzed By: DCS
Date Collected: 12/31/2008 13:25
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.04

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
Di-n-octylphthalate	BQL	371	57.1	1	1/7/2009	
4,6-Dinitro-2-methylphenol	BQL	1850	44.1	1	1/7/2009	
m-Dinitrobenzene	BQL	371	90.5	1	1/7/2009	
2,4-Dinitrophenol	BQL	1850	48.2	1	1/7/2009	
2,4-Dinitrotoluene	BQL	371	56.4	1	1/7/2009	
2,6-Dinitrotoluene	BQL	371	61.2	1	1/7/2009	
Dinoseb	BQL	1850	37.5	1	1/7/2009	
Diphenylamine *	BQL	371	46.7	1	1/7/2009	
Disulfoton	BQL	371	97.2	1	1/7/2009	
Ethylmethanesulfonate	BQL	371	51.2	1	1/7/2009	
Famphur	BQL	1850	64.9	1	1/7/2009	
Fluoranthene	BQL	371	59.7	1	1/7/2009	
Fluorene	BQL	371	57.9	1	1/7/2009	
Hexachlorobenzene	BQL	1850	80.5	1	1/7/2009	
Hexachlorobutadiene	BQL	371	67.5	1	1/7/2009	
Hexachlorocyclopentadiene	BQL	742	72.3	1	1/7/2009	
Hexachloroethane	BQL	371	57.9	1	1/7/2009	
Hexachlorophene	BQL	371	170	1	1/7/2009	
Hexachloropropene	BQL	742	59.3	1	1/7/2009	
Indeno(1,2,3-c,d)pyrene	BQL	371	43.8	1	1/7/2009	
Isodrin	BQL	371	51.9	1	1/7/2009	
Isophorone	BQL	371	54.1	1	1/7/2009	
Isosafrole	BQL	371	57.5	1	1/7/2009	
Kepone	BQL	1850	1850	1	1/7/2009	
Methapyrilene	BQL	371	371	1	1/7/2009	
Methyl parathion	BQL	371	156	1	1/7/2009	
Methylmethanesulfonate	BQL	371	52.7	1	1/7/2009	
2-Methylnaphthalene	BQL	371	60.4	1	1/7/2009	
2-Methylphenol	BQL	371	56.7	1	1/7/2009	
3- & 4-Methylphenol	BQL	371	48.2	1	1/7/2009	
3-Methylcholanthrene	BQL	371	46.0	1	1/7/2009	
Naphthalene	BQL	371	51.9	1	1/7/2009	
1,4-Naphthoquinone	BQL	371	68.6	1	1/7/2009	
1-Naphthylamine	BQL	1850	53.8	1	1/7/2009	
2-Naphthylamine	BQL	1850	31.9	1	1/7/2009	
5-Nitro-o-toluidine	BQL	371	53.8	1	1/7/2009	
2-Nitroaniline	BQL	371	49.7	1	1/7/2009	
3-Nitroaniline	BQL	1850	54.5	1	1/7/2009	
4-Nitroaniline	BQL	1850	49.7	1	1/7/2009	
Nitrobenzene	BQL	371	49.3	1	1/7/2009	
2-Nitrophenol	BQL	371	54.1	1	1/7/2009	
4-Nitrophenol	BQL	1850	64.5	1	1/7/2009	
4-Nitroquinoline-1-oxide	BQL	1850	148	1	1/7/2009	
N-Nitroso-di-n-butylamine	BQL	371	45.6	1	1/7/2009	
N-Nitrosodi-n-propylamine	BQL	371	59.7	1	1/7/2009	
N-Nitrosodiethylamine	BQL	371	51.9	1	1/7/2009	
N-Nitrosodimethylamine	BQL	371	55.3	1	1/7/2009	

SGS Environmental Services, Inc.

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-2H
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 33.69 g

Analyzed By: DCS
Date Collected: 12/31/2008 13:25
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 80.04

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
N-Nitrosomethylethylamine	BQL	371	66.0	1	1/7/2009	
N-Nitrosomorpholine	BQL	371	59.7	1	1/7/2009	
N-Nitrosopiperidine	BQL	371	52.3	1	1/7/2009	
N-Nitrosopyrrolidine	BQL	371	229	1	1/7/2009	
Parathion	BQL	742	87.9	1	1/7/2009	
Pentachlorobenzene	BQL	371	51.9	1	1/7/2009	
Pentachloronitrobenzene	BQL	371	53.4	1	1/7/2009	
Pentachlorophenol	BQL	1850	34.1	1	1/7/2009	
Phenacetin	BQL	371	70.5	1	1/7/2009	
Phenanthrene	BQL	371	51.9	1	1/7/2009	
Phenol	BQL	371	50.4	1	1/7/2009	
p-Phenylenediamine	BQL	742	507	1	1/7/2009	
Phorate	BQL	742	64.9	1	1/7/2009	
2-Piccoline	BQL	371	66.0	1	1/7/2009	
Pronamide	BQL	371	57.9	1	1/7/2009	
Pyrene	BQL	371	50.4	1	1/7/2009	
Pyridine	BQL	371	126	1	1/7/2009	
Safrole	BQL	371	56.4	1	1/7/2009	
Sulfotep	BQL	371	92.0	1	1/7/2009	
1,2,4,5-Tetrachlorobenzene	BQL	371	51.5	1	1/7/2009	
2,3,4,6-Tetrachlorophenol	BQL	371	61.9	1	1/7/2009	
Thionazin	BQL	742	215	1	1/7/2009	
o-Toluidine	BQL	371	73.4	1	1/7/2009	
1,2,4-Trichlorobenzene	BQL	371	66.8	1	1/7/2009	
2,4,5-Trichlorophenol	BQL	371	55.3	1	1/7/2009	
2,4,6-Trichlorophenol	BQL	371	33.0	1	1/7/2009	
O,O,O-Triethylphosphorothioate	BQL	371	178	1	1/7/2009	
1,3,5-Trinitrobenzene	BQL	1850	66.8	1	1/7/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9	90
2-Fluorophenol	10	9.5	94
Nitrobenzene-d5	10	9.3	93
Phenol-d6	10	10.3	103
2,4,6-Tribromophenol	10	7.9	79
4-Terphenyl-d14	10	7.4	74

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

SGS Environmental Services, Inc.

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-3J
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 32.62 g

Analyzed By: DCS
Date Collected: 12/31/2008 11:45
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 77.57

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	395	60.5	1	1/7/2009	
Acenaphthylene	BQL	395	55.3	1	1/7/2009	
Acetophenone	BQL	395	61.7	1	1/7/2009	
2-Acetylaminofluorene	BQL	790	55.3	1	1/7/2009	
4-Aminobiphenyl	BQL	395	44.3	1	1/7/2009	
Aniline	BQL	395	63.2	1	1/7/2009	
Anthracene	BQL	395	53.7	1	1/7/2009	
Aramite	BQL	395	84.2	1	1/7/2009	
Benzidine	BQL	790	115	1	1/7/2009	
Benzo[a]anthracene	BQL	395	54.1	1	1/7/2009	
Benzo[a]pyrene	BQL	395	56.9	1	1/7/2009	
Benzo[b]fluoranthene	BQL	395	54.9	1	1/7/2009	
Benzo[g,h,i]perylene	BQL	395	68.8	1	1/7/2009	
Benzo[k]fluoranthene	BQL	395	56.1	1	1/7/2009	
Benzyl Alcohol	BQL	790	71.1	1	1/7/2009	
Bis(2-chloroethoxy)methane	BQL	395	58.1	1	1/7/2009	
Bis(2-chloroethyl)ether	BQL	395	80.2	1	1/7/2009	
Bis(2-chloroisopropyl)ether	BQL	395	63.6	1	1/7/2009	
Bis(2-ethylhexyl)phthalate	BQL	395	60.5	1	1/7/2009	
4-Bromophenyl phenyl ether	BQL	395	70.0	1	1/7/2009	
Butylbenzylphthalate	BQL	395	58.5	1	1/7/2009	
Chlorobenzilate	BQL	395	49.0	1	1/7/2009	
2-Chloronaphthalene	BQL	395	54.9	1	1/7/2009	
2-Chlorophenol	BQL	395	50.2	1	1/7/2009	
4-Chloro-3-methylphenol	BQL	395	57.7	1	1/7/2009	
4-Chloroaniline	BQL	395	64.4	1	1/7/2009	
4-Chlorophenyl phenyl ether	BQL	395	58.1	1	1/7/2009	
Chrysene	BQL	395	37.9	1	1/7/2009	
Diallate	BQL	395	257	1	1/7/2009	
Dibenz[a,j]acridine	BQL	395	305	1	1/7/2009	
Dibenzo[a,h]anthracene	BQL	395	50.6	1	1/7/2009	
Dibenzofuran	BQL	395	55.7	1	1/7/2009	
Di-n-Butylphthalate	BQL	395	57.7	1	1/7/2009	
1,2-Dichlorobenzene	BQL	395	66.8	1	1/7/2009	
1,3-Dichlorobenzene	BQL	395	64.0	1	1/7/2009	
1,4-Dichlorobenzene	BQL	395	57.3	1	1/7/2009	
3,3'-Dichlorobenzidine	BQL	790	65.2	1	1/7/2009	
2,4-Dichlorophenol	BQL	395	43.1	1	1/7/2009	
2,6-Dichlorophenol	BQL	395	54.9	1	1/7/2009	
Diethylphthalate	BQL	395	53.0	1	1/7/2009	
Dimethoate	BQL	395	59.7	1	1/7/2009	
3,3'-Dimethylbenzidine	BQL	1980	883	1	1/7/2009	
a,a-Dimethylphenethylamine	BQL	1980	790	1	1/7/2009	
Dimethylphthalate	BQL	395	61.3	1	1/7/2009	
p-Dimethylaminoazobenzene	BQL	395	53.4	1	1/7/2009	
7,12-Dimethylbenz[a]anthracene	BQL	395	190	1	1/7/2009	
2,4-Dimethylphenol	BQL	395	71.5	1	1/7/2009	

SGS Environmental Services, Inc.

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-3J
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 32.62 g

Analyzed By: DCS
Date Collected: 12/31/2008 11:45
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 77.57

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
Di-n-octylphthalate	BQL	395	60.9	1	1/7/2009	
4,6-Dinitro-2-methylphenol	BQL	1980	47.0	1	1/7/2009	
m-Dinitrobenzene	BQL	395	96.4	1	1/7/2009	
2,4-Dinitrophenol	BQL	1980	51.4	1	1/7/2009	
2,4-Dinitrotoluene	BQL	395	60.1	1	1/7/2009	
2,6-Dinitrotoluene	BQL	395	65.2	1	1/7/2009	
Dinoseb	BQL	1980	39.9	1	1/7/2009	
Diphenylamine *	BQL	395	49.8	1	1/7/2009	
Disulfoton	BQL	395	104	1	1/7/2009	
Ethylmethanesulfonate	BQL	395	54.5	1	1/7/2009	
Famphur	BQL	1980	69.2	1	1/7/2009	
Fluoranthene	BQL	395	63.6	1	1/7/2009	
Fluorene	BQL	395	61.7	1	1/7/2009	
Hexachlorobenzene	BQL	1980	85.8	1	1/7/2009	
Hexachlorobutadiene	BQL	395	71.9	1	1/7/2009	
Hexachlorocyclopentadiene	BQL	790	77.1	1	1/7/2009	
Hexachloroethane	BQL	395	61.7	1	1/7/2009	
Hexachlorophene	BQL	395	181	1	1/7/2009	
Hexachloropropene	BQL	790	63.2	1	1/7/2009	
Indeno(1,2,3-c,d)pyrene	BQL	395	46.6	1	1/7/2009	
Isodrin	BQL	395	55.3	1	1/7/2009	
Isophorone	BQL	395	57.7	1	1/7/2009	
Isosafrole	BQL	395	61.3	1	1/7/2009	
Kepone	BQL	1980	1980	1	1/7/2009	
Methapyrilene	BQL	395	395	1	1/7/2009	
Methyl parathion	BQL	395	167	1	1/7/2009	
Methylmethanesulfonate	BQL	395	56.1	1	1/7/2009	
2-Methylnaphthalene	BQL	395	64.4	1	1/7/2009	
2-Methylphenol	BQL	395	60.5	1	1/7/2009	
3- & 4-Methylphenol	BQL	395	51.4	1	1/7/2009	
3-Methylcholanthrene	BQL	395	49.0	1	1/7/2009	
Naphthalene	BQL	395	55.3	1	1/7/2009	
1,4-Naphthoquinone	BQL	395	73.1	1	1/7/2009	
1-Naphthylamine	BQL	1980	57.3	1	1/7/2009	
2-Naphthylamine	BQL	1980	34.0	1	1/7/2009	
5-Nitro-o-toluidine	BQL	395	57.3	1	1/7/2009	
2-Nitroaniline	BQL	395	53.0	1	1/7/2009	
3-Nitroaniline	BQL	1980	58.1	1	1/7/2009	
4-Nitroaniline	BQL	1980	53.0	1	1/7/2009	
Nitrobenzene	BQL	395	52.6	1	1/7/2009	
2-Nitrophenol	BQL	395	57.7	1	1/7/2009	
4-Nitrophenol	BQL	1980	68.8	1	1/7/2009	
4-Nitroquinoline-1-oxide	BQL	1980	158	1	1/7/2009	
N-Nitroso-di-n-butylamine	BQL	395	48.6	1	1/7/2009	
N-Nitrosodi-n-propylamine	BQL	395	63.6	1	1/7/2009	
N-Nitrosodiethylamine	BQL	395	55.3	1	1/7/2009	
N-Nitrosodimethylamine	BQL	395	58.9	1	1/7/2009	

Results for Semivolatiles
by GCMS 8270-Appendix II

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-3J
Lab Project ID: G175-685
Report Basis: Dry weight
Initial Weight: 32.62 g

Analyzed By: DCS
Date Collected: 12/31/2008 11:45
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
% Solids: 77.57

Compound	Result ug/Kg	RL ug/Kg	MDL ug/Kg	Dilution Factor	Date Analyzed	Flag
N-Nitrosomethylethylamine	BQL	395	70.3	1	1/7/2009	
N-Nitrosomorpholine	BQL	395	63.6	1	1/7/2009	
N-Nitrosopiperidine	BQL	395	55.7	1	1/7/2009	
N-Nitrosopyrrolidine	BQL	395	244	1	1/7/2009	
Parathion	BQL	790	93.7	1	1/7/2009	
Pentachlorobenzene	BQL	395	55.3	1	1/7/2009	
Pentachloronitrobenzene	BQL	395	56.9	1	1/7/2009	
Pentachlorophenol	BQL	1980	36.4	1	1/7/2009	
Phenacetin	BQL	395	75.1	1	1/7/2009	
Phenanthrene	BQL	395	55.3	1	1/7/2009	
Phenol	BQL	395	53.7	1	1/7/2009	
p-Phenylenediamine	BQL	790	540	1	1/7/2009	
Phorate	BQL	790	69.2	1	1/7/2009	
2-Piccoline	BQL	395	70.3	1	1/7/2009	
Pronamide	BQL	395	61.7	1	1/7/2009	
Pyrene	BQL	395	53.7	1	1/7/2009	
Pyridine	BQL	395	134	1	1/7/2009	
Safrole	BQL	395	60.1	1	1/7/2009	
Sulfotep	BQL	395	98.0	1	1/7/2009	
1,2,4,5-Tetrachlorobenzene	BQL	395	54.9	1	1/7/2009	
2,3,4,6-Tetrachlorophenol	BQL	395	66.0	1	1/7/2009	
Thionazin	BQL	790	229	1	1/7/2009	
o-Toluidine	BQL	395	78.3	1	1/7/2009	
1,2,4-Trichlorobenzene	BQL	395	71.1	1	1/7/2009	
2,4,5-Trichlorophenol	BQL	395	58.9	1	1/7/2009	
2,4,6-Trichlorophenol	BQL	395	35.2	1	1/7/2009	
O,O,O-Triethylphosphorothioate	BQL	395	190	1	1/7/2009	
1,3,5-Trinitrobenzene	BQL	1980	71.1	1	1/7/2009	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.6	86
2-Fluorophenol	10	9	90
Nitrobenzene-d5	10	9.1	91
Phenol-d6	10	9.9	99
2,4,6-Tribromophenol	10	7.4	74
4-Terphenyl-d14	10	7.6	76

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for PCBs
by EPA 8082

Client Sample ID: S1
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-1N
Lab Project ID: G175-685
Initial Wt/Vol: 34.40 g
Final Volume: 10 mL
ColumnID: STX-CLPest

Analyzed By: BWS
Date Collected: 12/31/2008 11:10
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
%SOLIDS: 80.1
Report Basis: Dry Weight

Compound	Result ug/KG	Quantitation Limit ug/KG	MDL	Dilution Factor	Date Analyzed	Flags
Aroclor-1016	BQL	36.3	4.35	1	01/07/09	
Aroclor-1221	BQL	36.3	6.60	1	01/07/09	
Aroclor-1232	BQL	36.3	3.20	1	01/07/09	
Aroclor-1242	BQL	36.3	4.57	1	01/07/09	
Aroclor-1248	BQL	36.3	3.09	1	01/07/09	
Aroclor-1254	BQL	36.3	10.7	1	01/07/09	
Aroclor-1260	BQL	36.3	4.75	1	01/07/09	

Surrogate Spike Recoveries	Spike Added (ug/L)	Spike Result (ug/L)	Percent Recovered (%)
TCMX	100	84.6	84.6
DCBP	100	91.1	91.1

Comments:
BQL = Below Quantitation Limit
NA = Not applicable, surrogate diluted out.

Reviewed By:

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SGS Environmental Services, Inc.

Results for PCBs
by EPA 8082

Client Sample ID: S2
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-2K
Lab Project ID: G175-685
Initial Wt/Vol: 33.20 g
Final Volume: 10 mL
ColumnID: STX-CLPest

Analyzed By: BWS
Date Collected: 12/31/2008 13:25
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
%SOLIDS: 80.0
Report Basis: Dry Weight

Compound	Result ug/KG	Quantitation Limit ug/KG	MDL	Dilution Factor	Date Analyzed	Flags
Aroclor-1016	BQL	37.6	4.52	1	01/07/09	
Aroclor-1221	BQL	37.6	6.85	1	01/07/09	
Aroclor-1232	BQL	37.6	3.32	1	01/07/09	
Aroclor-1242	BQL	37.6	4.74	1	01/07/09	
Aroclor-1248	BQL	37.6	3.20	1	01/07/09	
Aroclor-1254	BQL	37.6	11.1	1	01/07/09	
Aroclor-1260	BQL	37.6	4.93	1	01/07/09	

Surrogate Spike Recoveries	Spike Added (ug/L)	Spike Result (ug/L)	Percent Recovered (%)
TCMX	100	97.9	97.9
DCBP	100	97.9	97.9

Comments:
BQL = Below Quantitation Limit
NA = Not applicable, surrogate diluted out.

Reviewed By:

8082.xls

SGS Environmental Services, Inc.

Results for PCBs
by EPA 8082

Client Sample ID: S3
Client Project ID: N Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-685-3K
Lab Project ID: G175-685
Initial Wt/Vol: 30.95 g
Final Volume: 10 mL
ColumnID: STX-CLPest

Analyzed By: BWS
Date Collected: 12/31/2008 11:45
Date Received: 1/2/2009
Date Extracted: 1/5/2009
Matrix: Soil
%SOLIDS: 77.6
Report Basis: Dry Weight

Compound	Result ug/KG	Quantitation Limit ug/KG	MDL	Dilution Factor	Date Analyzed	Flags
Aroclor-1016	BQL	41.6	5.00	1	01/07/09	
Aroclor-1221	BQL	41.6	7.58	1	01/07/09	
Aroclor-1232	BQL	41.6	3.68	1	01/07/09	
Aroclor-1242	BQL	41.6	5.25	1	01/07/09	
Aroclor-1248	BQL	41.6	3.54	1	01/07/09	
Aroclor-1254	BQL	41.6	12.3	1	01/07/09	
Aroclor-1260	BQL	41.6	5.46	1	01/07/09	

Surrogate Spike Recoveries	Spike Added (ug/L)	Spike Result (ug/L)	Percent Recovered (%)
TCMX	100	73.0	73.0
DCBP	100	84.4	84.4

Comments:
BQL = Below Quantitation Limit
NA = Not applicable, surrogate diluted out.

Reviewed By:

8082.xls

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CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

Locations Nationwide
- Alaska
- Ohio
- New Jersey
- West Virginia
- Hawaii
- Maryland
- North Carolina

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090494

(1)

CLIENT: CDM

CONTACT: Aaron Weispfenning PHONE NO:(919) 325-3500

PROJECT: N Wake Leachate Pond SITE/PWSID#: at Lined Landfill

REPORTS TO: Dan Forbes E-MAIL: On File FAX NO.:( )

INVOICE TO: Same QUOTE # P.O. NUMBER

SGS Reference: G175-685

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C= COMP G= GRAB	App II VOC by 8260	App II Metals	Pesticides/Herbicides	SVOC/PCB by 8270						REMARKS
							Preservatives Used	—	—	—	—					
							Analysis Required (3)									
	S1	12/31/08	1110	S	4	G	1	1	1	1						-Provide Electronic
	S2	12/31/08	1225	S	4	G	1	1	1	1						Deliverable
	S3	12/31/08	1125	S	4	G	1	1	1	1						-Report "T" Values
																-Report Results
																according to SWSL
																reporting limits

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:	Date	Time
[signature]	12/31/08	1415	Willard Hunt	12/31/8	14:15
Relinquished By: (2) Willard Hunt	Date 1/2/08	Time 12:47	Received By: [signature]	Date 1/2/09	Time 12:47
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 5.9 °F

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☒ RUSH 5 day TAT Date Needed ☒ STD

☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

SGS Environmental Services, Inc.

N.C. Certification #481

APPENDIX A-7

Background Sample Location
(Onsite Borrow Area)

SGS

Mat Colone
Camp, Dresser & McKee
5400 Glenwood Avenue
Raleigh, NC 27612

Report Number: G175-686

Client Project: N Wake Leachate Pond

Dear Mat Colone,

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call SGS Environmental Services at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS Environmental Services for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
SGS Environmental Services, Inc.

Ashley Nifong 1/13/09

Project Manager Date
Ashley Nifong

List of Reporting Abbreviations
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:
1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.021808.4

Results for Metals

Client Sample ID:	Background	Analyzed By:	PSW DCP
Client Project ID:	N Wake Leachate Pond at Lined Landfill	Date Collected:	1/9/2009 12:05
Lab Sample ID:	G175-686-1	Date Received:	1/10/2009
Lab Project ID:	G175-686	Matrix:	SOIL
ICP InitWt/Vol:	0.57 g Final Vol: 50 mL	Solids	84.14
Hg InitWt/Vol:	0.58 g Final Vol: 50 mL	Report Basis:	Dry
Prep Batch:	13413 13422		

Metals	Result	RL	MDL	DF	Units	Method	Date Analyzed	Flags
Antimony	BQL	0.626	0.943	1	MG/KG	6010B	1/12/2009	
Arsenic	**3.39**	1.04	0.834	1	MG/KG	6010B	1/12/2009	
Barium	**74.8**	10.4	0.491	1	MG/KG	6010B	1/12/2009	B
Beryllium	**1.46**	0.104	0.730	1	MG/KG	6010B	1/12/2009	
Cadmium	BQL	0.521	0.142	1	MG/KG	6010B	1/12/2009	B
Chromium	**20.9**	1.04	0.115	1	MG/KG	6010B	1/12/2009	B
Cobalt	**12.6**	1.04	0.287	1	MG/KG	6010B	1/12/2009	
Copper	**41.6**	1.04	0.188	1	MG/KG	6010B	1/12/2009	B
Lead	**15.8**	1.04	0.669	1	MG/KG	6010B	1/12/2009	
Mercury	**0.0318**	0.0205	0.00118	1	MG/KG	7471	1/13/2009	
Nickel	**9.64**	5.21	0.627	1	MG/KG	6010B	1/12/2009	
Selenium	**10.1**	1.04	0.759	1	MG/KG	6010B	1/12/2009	
Silver	BQL	1.04	0.0916	1	MG/KG	6010B	1/12/2009	B
Thallium	BQL	0.573	0.917	1	MG/KG	6010B	1/12/2009	
Tin	BQL	10.4	0.391	1	MG/KG	6010B	1/13/2009	B
Vanadium	**76.4**	5.21	0.631	1	MG/KG	6010B	1/12/2009	
Zinc	**51.3**	1.04	0.335	1	MG/KG	6010B	1/12/2009	

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By:
METALS.XLS

SGS

CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

Locations Nationwide
- Alaska
- Hawaii
- Ohio
- Maryland
- New Jersey
- North Carolina
- West Virginia

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090456

(1)
CLIENT: CDM
CONTACT: Aaron Weisenfenning PHONE NO:( ) 325-3500
PROJECT: Nixon Landfill (Fed) SITE/PWSID#: Nixon Landfill
REPORTS TO: E-MAIL: On File
Matt Colone FAX NO.:(919) 781-5730
INVOICE TO: Same QUOTE #
P.O. NUMBER

SGS Reference: 0175-686

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used	Analysis Required (3): App. II Metals	REMARKS
	Background	1/7/09	1205	S	2	G		2	-Provide Electronic Data Deliverable -Report results on dry weight basis -Report Results to MDL -Report "J" values for limits -Report "J" values

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:	Date	Time
[signature]	1/7/09	1240	L. Lockamy	1/8/09	940
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time

(4)
Shipping Carrier: Fed Ex
Shipping Ticket No:
Samples Received Cold? (Circle) YES NO
Temperature °C: 3.0° F
Special Deliverable Requirements:
Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
Special Instructions:
Requested Turnaround Time:
☒ RUSH 24 hrs ☐ STD
Date Needed

SGS Environmental Services, Inc.

N.C. Certification #481

Page 4 of 4

☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

APPENDIX A-7

Background Sample Location
(Onsite Borrow Area)

SGS

Mat Colone
Camp, Dresser & McKee
5400 Glenwood Avenue
Raleigh, NC 27612

Report Number: G175-689

Client Project: N. Wake Leachate Pond at Lined Landfill

Dear Mat Colone,

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call SGS Environmental Services at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS Environmental Services for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
SGS Environmental Services, Inc.

Ashley Nifong 1/28/09

Project Manager
Ashley Nifong

Date

List of Reporting Abbreviations
And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:
1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.021808.4

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260-5030

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-689-1A
Lab Project ID: G175-689
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 01-26-2009 11:20
Date Received: 1/27/2009
Matrix: Soil
Sample Amount: 5.11 g
%Solids: 76.5

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	Dilution Factor	Date Analyzed
Acetone	BQL	63.8	1	1/29/2009
Benzene	BQL	6.38	1	1/29/2009
Bromobenzene	BQL	6.38	1	1/29/2009
Bromochloromethane	BQL	6.38	1	1/29/2009
Bromodichloromethane	BQL	6.38	1	1/29/2009
Bromoform	BQL	6.38	1	1/29/2009
Bromomethane	BQL	6.38	1	1/29/2009
2-Butanone	BQL	31.9	1	1/29/2009
n-Butylbenzene	BQL	6.38	1	1/29/2009
sec-Butylbenzene	BQL	6.38	1	1/29/2009
tert-Butylbenzene	BQL	6.38	1	1/29/2009
Carbon disulfide	BQL	6.38	1	1/29/2009
Carbon tetrachloride	BQL	6.38	1	1/29/2009
Chlorobenzene	BQL	6.38	1	1/29/2009
Chloroethane	BQL	6.38	1	1/29/2009
Chloroform	BQL	6.38	1	1/29/2009
Chloromethane	BQL	6.38	1	1/29/2009
2-Chlorotoluene	BQL	6.38	1	1/29/2009
4-Chlorotoluene	BQL	6.38	1	1/29/2009
Dibromochloromethane	BQL	6.38	1	1/29/2009
1,2-Dibromo-3-chloropropane	BQL	6.38	1	1/29/2009
Dibromomethane	BQL	6.38	1	1/29/2009
1,2-Dibromoethane (EDB)	BQL	6.38	1	1/29/2009
1,2-Dichlorobenzene	BQL	6.38	1	1/29/2009
1,3-Dichlorobenzene	BQL	6.38	1	1/29/2009
1,4-Dichlorobenzene	BQL	6.38	1	1/29/2009
trans-1,4-Dichloro-2-butene	BQL	6.38	1	1/29/2009
1,1-Dichloroethane	BQL	6.38	1	1/29/2009
1,1-Dichloroethene	BQL	6.38	1	1/29/2009
1,2-Dichloroethane	BQL	6.38	1	1/29/2009
cis-1,2-Dichloroethene	BQL	6.38	1	1/29/2009
trans-1,2-dichloroethene	BQL	6.38	1	1/29/2009
1,2-Dichloropropane	BQL	6.38	1	1/29/2009
1,3-Dichloropropane	BQL	6.38	1	1/29/2009
2,2-Dichloropropane	BQL	6.38	1	1/29/2009
1,1-Dichloropropene	BQL	6.38	1	1/29/2009
cis-1,3-Dichloropropene	BQL	6.38	1	1/29/2009
trans-1,3-Dichloropropene	BQL	6.38	1	1/29/2009
Dichlorodifluoromethane	BQL	6.38	1	1/29/2009
Diisopropyl ether (DIPE)	BQL	6.38	1	1/29/2009
Ethylbenzene	BQL	6.38	1	1/29/2009
Hexachlorobutadiene	BQL	6.38	1	1/29/2009
2-Hexanone	BQL	6.38	1	1/29/2009
Iodomethane	BQL	6.38	1	1/29/2009

SGS Environmental Services, Inc.

Results for Volatiles
by GCMS 8260-5030

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID G175-689-1A
Lab Project ID: G175-689
Report Basis: Dry Weight

Analyzed By: MJC
Date Collected: 01-26-2009 11:20
Date Received: 1/27/2009
Matrix: Soil
Sample Amount: 5.11 g
%Solids: 76.5

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	Dilution Factor	Date Analyzed
Isopropylbenzene	BQL	6.38	1	1/29/2009
4-Isopropyltoluene	BQL	6.38	1	1/29/2009
Methylene chloride	BQL	25.5	1	1/29/2009
4-Methyl-2-pentanone	BQL	6.38	1	1/29/2009
Methyl-tert-butyl ether (MTBE)	BQL	6.38	1	1/29/2009
Naphthalene	BQL	6.38	1	1/29/2009
n-Propyl benzene	BQL	6.38	1	1/29/2009
Styrene	BQL	6.38	1	1/29/2009
1,1,1,2-Tetrachloroethane	BQL	6.38	1	1/29/2009
1,1,2,2-Tetrachloroethane	BQL	6.38	1	1/29/2009
Tetrachloroethene	BQL	6.38	1	1/29/2009
Toluene	BQL	6.38	1	1/29/2009
1,2,3-Trichlorobenzene	BQL	6.38	1	1/29/2009
1,2,4-Trichlorobenzene	BQL	6.38	1	1/29/2009
Trichloroethene	BQL	6.38	1	1/29/2009
1,1,1-Trichloroethane	BQL	6.38	1	1/29/2009
1,1,2-Trichloroethane	BQL	6.38	1	1/29/2009
Trichlorofluoromethane	BQL	6.38	1	1/29/2009
1,2,3-Trichloropropane	BQL	6.38	1	1/29/2009
1,2,4-Trimethylbenzene	BQL	6.38	1	1/29/2009
1,3,5-Trimethylbenzene	BQL	6.38	1	1/29/2009
Vinyl chloride	BQL	6.38	1	1/29/2009
m-,p-Xylene	BQL	12.8	1	1/29/2009
o-Xylene	BQL	6.38	1	1/29/2009

	Spike Added	Spike Result	Percent Recovered
1,2-Dichloroethane-d4	50	48.6	97
Toluene-d8	50	50.3	101
4-Bromofluorobenzene	50	38.5	77

Comments:

Flags:
BQL = Below Quantitation Limits.

Analyst: _____

Reviewed By: _____

SGS Environmental Services, Inc.

Results for Herbicides
by EPA 8151

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-689-1L
Lab Project ID: G175-689
Sample Wt/Vol: 32.43 g
Report Basis: Dry Weight

Analyzed By: ALT
Date Collected: 1/26/2009 11:20
Date Received: 1/27/2009
Date Extracted: 1/27/2009
Matrix: Soil
% Solids: 76.5

Compound	Result ug/KG	Quantitation Limit ug/KG	Dilution Factor	Date Analyzed
2,4-D	BQL	40.3	1	1/28/2009
2,4,5-TP(Silvex)	BQL	40.3	1	1/28/2009
2,4,5-T	BQL	40.3	1	1/28/2009

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered	Limits
DCAA	2.0	1.4	70	35-135

Comments:
BQL = Below Quantitation Limit
Column IDs: RTX_CLPesticides / RTX_CLPesticides2

Reviewed By: _____

SGS Environmental Services, Inc.

Results for PCBs
by EPA 8082

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-689-1O
Lab Project ID: G175-689
Initial Wt/Vol: 32.09 g
Final Volume: 10 mL
ColumnID: STX-CLPest

Analyzed By: BWS
Date Collected: 1/26/2009 11:20
Date Received: 1/27/2009
Date Extracted: 1/27/2009
Matrix: Soil
%SOLIDS: 76.5
Report Basis: Dry Weight

Compound	Result ug/KG	Quantitation Limit ug/KG	Dilution Factor	Date Analyzed	Flags
Aroclor-1016	BQL	40.7	1	01/28/09	
Aroclor-1221	BQL	40.7	1	01/28/09	
Aroclor-1232	BQL	40.7	1	01/28/09	
Aroclor-1242	BQL	40.7	1	01/28/09	
Aroclor-1248	BQL	40.7	1	01/28/09	
Aroclor-1254	BQL	40.7	1	01/28/09	
Aroclor-1260	BQL	40.7	1	01/28/09	

Surrogate Spike Recoveries	Spike Added (ug/L)	Spike Result (ug/L)	Percent Recovered (%)
TCMX	100	86.5	86.5
DCBP	100	80.4	80.4

Comments:
BQL = Below Quantitation Limit
NA = Not applicable, surrogate diluted out.

Reviewed By: _____

8082.xls

Results for Pesticides
by EPA 8081

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-689-1R
Lab Project ID: G175-689
Sample Wt/Vol: 33.51 g ColumnID: STX_CLPest
Report Basis: Dry Weight

Analyzed By: EAW
Date Collected: 1/26/2009 11:20
Date Received: 1/27/2009
Date Extracted: 1/27/2009
Matrix: Soil
% Solids: 76.5

Compound	Result ug/KG	RL ug/KG	Dilution Factor	Date Analyzed	Flags
alpha-BHC	BQL	11.7	1.0	1/28/2009	
beta-BHC	BQL	11.7	1.0	1/28/2009	
delta-BHC	BQL	11.7	1.0	1/28/2009	
gamma-BHC (Lindane)	BQL	11.7	1.0	1/28/2009	
Heptachlor	BQL	11.7	1.0	1/28/2009	
Aldrin	BQL	11.7	1.0	1/28/2009	
Heptachlor epoxide	BQL	11.7	1.0	1/28/2009	
Endosulfan I	BQL	11.7	1.0	1/28/2009	
Dieldrin	BQL	11.7	1.0	1/28/2009	
4,4'-DDE	BQL	11.7	1.0	1/28/2009	
Endrin	BQL	11.7	1.0	1/28/2009	
DDD	BQL	11.7	1.0	1/28/2009	
Endosulfan II	BQL	11.7	1.0	1/28/2009	
4,4'-DDT	BQL	11.7	1.0	1/28/2009	
Methoxychlor	BQL	11.7	1.0	1/28/2009	
Toxaphene	BQL	39.0	1.0	1/28/2009	
alpha-Chlordane	BQL	11.7	1.0	1/28/2009	
gamma-Chlordane	BQL	11.7	1.0	1/28/2009	
Chlordane, Total	BQL	19.5	1.0	1/28/2009	
Endrin aldehyde	BQL	11.7	1.0	1/28/2009	
Endosulfan sulfate	BQL	11.7	1.0	1/28/2009	
Endrin ketone	BQL	11.7	1.0	1/28/2009	

	Spike Added	Spike Result	Percent Recovered
TCMX	100	70.8	70.8
DBC	100	65.8	65.8

Comments:
BQL = Below Quantitation Limit

Reviewed By: [signature]

8081

Results for Metals

Client Sample ID:	Vault	Analyzed By:	PSW DCP
Client Project ID:	N. Wake Leachate Pond at Lined Landfill	Date Collected:	1/26/2009 11:20
Lab Sample ID:	G175-689-1	Date Received:	1/27/2009
Lab Project ID:	G175-689	Matrix:	SOIL
ICP InitWt/Vol:	0.54 g Final Vol: 50 mL	Solids	76.53
Hg InitWt/Vol:	0.5 g Final Vol: 50 mL	Report Basis:	Dry
Prep Batch:	13524 13533		

Metals	Result	SWSL	DF	Units	Method	Date Analyzed
Antimony	BQL	0.726	1	MG/KG	6010B	1/27/2009
Arsenic	BQL	1.21	1	MG/KG	6010B	1/27/2009
Barium	**34.4**	12.1	1	MG/KG	6010B	1/27/2009
Beryllium	BQL	0.121	1	MG/KG	6010B	1/27/2009
Cadmium	BQL	0.121	10	MG/KG	6020	1/28/2009
Chromium	**22.0**	1.21	1	MG/KG	6010B	1/27/2009
Cobalt	**6.73**	1.21	1	MG/KG	6010B	1/27/2009
Copper	**33.8**	1.21	1	MG/KG	6010B	1/27/2009
Lead	**12.2**	1.21	1	MG/KG	6010B	1/27/2009
Mercury	**0.0286**	0.0261	1	MG/KG	7471	1/28/2009
Nickel	**11.8**	6.05	1	MG/KG	6010B	1/27/2009
Selenium	**13.7**	1.21	1	MG/KG	6010B	1/27/2009
Silver	BQL	1.21	1	MG/KG	6010B	1/27/2009
Thallium	BQL	0.665	1	MG/KG	6010B	1/27/2009
Tin	BQL	12.1	1	MG/KG	6010B	1/28/2009
Vanadium	**124**	12.1	1000	MG/KG	6020	1/28/2009
Zinc	**24.5**	1.21	1	MG/KG	6010B	1/27/2009

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By: _____
METALS.XLS

Results for Semivolatiles
by GCMS 8270

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-689-1U
Lab Project ID: G175-689
Report Basis: Dry weight
Initial Weight: 31.88 g

Analyzed By: DCS
Date Collected: 1/26/2009 11:20
Date Received: 1/27/2009
Date Extracted: 1/27/2009
Matrix: Soil
% Solids: 76.53

Compound	Result ug/Kg	RL ug/Kg	Dilution Factor	Date Analyzed
Acenaphthene	BQL	410	1	1/28/2009
Acenaphthylene	BQL	410	1	1/28/2009
Anthracene	BQL	410	1	1/28/2009
Benzo[a]anthracene	BQL	410	1	1/28/2009
Benzo[a]pyrene	BQL	410	1	1/28/2009
Benzo[b]fluoranthene	BQL	410	1	1/28/2009
Benzo[g,h,i]perylene	BQL	410	1	1/28/2009
Benzo[k]fluoranthene	BQL	410	1	1/28/2009
Benzoic Acid	BQL	820	1	1/28/2009
Bis(2-chloroethoxy)methane	BQL	410	1	1/28/2009
Bis(2-chloroethyl)ether	BQL	410	1	1/28/2009
Bis(2-chloroisopropyl)ether	BQL	410	1	1/28/2009
Bis(2-ethylhexyl)phthalate	BQL	410	1	1/28/2009
4-bromophenyl phenyl ether	BQL	410	1	1/28/2009
Butylbenzylphthalate	BQL	410	1	1/28/2009
2-Chloronaphthalene	BQL	410	1	1/28/2009
2-Chlorophenol	BQL	410	1	1/28/2009
4-Chloro-3-methylphenol	BQL	410	1	1/28/2009
4-Chloroaniline	BQL	2050	1	1/28/2009
4-Chlorophenyl phenyl ether	BQL	410	1	1/28/2009
Chrysene	BQL	410	1	1/28/2009
Dibenzo[a,h]anthracene	BQL	410	1	1/28/2009
Dibenzofuran	BQL	410	1	1/28/2009
Di-n-Butylphthalate	BQL	410	1	1/28/2009
1,2-Dichlorobenzene	BQL	410	1	1/28/2009
1,3-Dichlorobenzene	BQL	410	1	1/28/2009
1,4-Dichlorobenzene	BQL	410	1	1/28/2009
3,3'-Dichlorobenzidine	BQL	820	1	1/28/2009
2,4-Dichlorophenol	BQL	410	1	1/28/2009
Diethylphthalate	BQL	410	1	1/28/2009
Dimethylphthalate	BQL	410	1	1/28/2009
2,4-Dimethylphenol	BQL	410	1	1/28/2009
Di-n-octylphthalate	BQL	410	1	1/28/2009
4,6-Dinitro-2-methylphenol	BQL	2050	1	1/28/2009
2,4-Dinitrophenol	BQL	2050	1	1/28/2009
2,4-Dinitrotoluene	BQL	410	1	1/28/2009
2,6-Dinitrotoluene	BQL	410	1	1/28/2009
Diphenylamine *	BQL	410	1	1/28/2009
Fluoranthene	BQL	410	1	1/28/2009
Fluorene	BQL	410	1	1/28/2009
Hexachlorobenzene	BQL	410	1	1/28/2009
Hexachlorobutadiene	BQL	410	1	1/28/2009
Hexachlorocyclopentadiene	BQL	820	1	1/28/2009
Hexachloroethane	BQL	410	1	1/28/2009
Indeno(1,2,3-c,d)pyrene	BQL	410	1	1/28/2009
Isophorone	BQL	410	1	1/28/2009
2-Methylnaphthalene	BQL	410	1	1/28/2009

SGS Environmental Services, Inc.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: Vault
Client Project ID: N. Wake Leachate Pond at Lined Landfill
Lab Sample ID: G175-689-1U
Lab Project ID: G175-689
Report Basis: Dry weight
Initial Weight: 31.88 g

Analyzed By: DCS
Date Collected: 1/26/2009 11:20
Date Received: 1/27/2009
Date Extracted: 1/27/2009
Matrix: Soil
% Solids: 76.53

Compound	Result ug/Kg	RL ug/Kg	Dilution Factor	Date Analyzed
2-Methylphenol	BQL	410	1	1/28/2009
3- & 4-Methylphenol	BQL	410	1	1/28/2009
Naphthalene	BQL	410	1	1/28/2009
2-Nitroaniline	BQL	410	1	1/28/2009
3-Nitroaniline	BQL	2050	1	1/28/2009
4-Nitroaniline	BQL	2050	1	1/28/2009
Nitrobenzene	BQL	410	1	1/28/2009
2-Nitrophenol	BQL	410	1	1/28/2009
4-Nitrophenol	BQL	2050	1	1/28/2009
N-Nitrosodi-n-propylamine	BQL	410	1	1/28/2009
Pentachlorophenol	BQL	2050	1	1/28/2009
Phenanthrene	BQL	410	1	1/28/2009
Phenol	BQL	410	1	1/28/2009
Pyrene	BQL	410	1	1/28/2009
1,2,4-Trichlorobenzene	BQL	410	1	1/28/2009
2,4,5-Trichlorophenol	BQL	410	1	1/28/2009
2,4,6-Trichlorophenol	BQL	410	1	1/28/2009

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.7	87
2-Fluorophenol	10	8.2	82
Nitrobenzene-d5	10	9.9	99
Phenol-d6	10	9.1	91
2,4,6-Tribromophenol	10	7.7	78
4-Terphenyl-d14	10	8.6	86

Comments:
* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:
BQL = Below Quantitation Limits.

Reviewed By:

SGS

CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

Locations Nationwide
- Alaska
- Ohio
- New Jersey
- West Virginia
- Hawaii
- Maryland
- North Carolina

www.us.sgs.com

090467

SGS Reference: G175-689

PAGE 1 OF 1

(1)

CLIENT: CDM

CONTACT: Mat Colone PHONE NO:(919) 325-3500

PROJECT: N. Wake Leachate Pond at Lined Landfill ✓ SITE/PWSID#:

REPORTS TO: Mat Colone E-MAIL: on file

FAX NO.:(919) 781-5730

INVOICE TO: Same QUOTE #

P.O. NUMBER

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C= COMP G= GRAB	VOC by 8260	SVOC by 8270	Pesticide by 8081	Herbicide by 8151	PCB by 8082	Metals by NC SWS Appendix III				REMARKS
	Vault	1/26/09	1120	S	6	G	1	1	1	1	1	1				-standard reporting limits
																-do not report "J"
																values

(3) Preservatives Used: — — — — — —

Analysis Required

(4)

Shipping Carrier: Fedex

Shipping Ticket No:

Special Deliverable Requirements:

Samples Received Cold? (Circle) YES NO

Temperature °C: 3.7

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☒ RUSH 24 hrs Date Needed ☐ STD

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:	Date	Time
[signature]	1/26/09	1300	[signature]	1/27/09	1250
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time

☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

SGS Environmental Services, Inc.

APPENDIX B-1

LLDPE Liner Manufacturer Qualifications and Experience

COMPANY CONFIDENTIAL

- The following information is provided on a confidential basis in compliance with a request for such information in connection with the North Wake Landfill in Raleigh, NC.

Address:	500 Garrison Road Georgetown, South Carolina	2000 E. Newland Drive Fernley, Nevada
Area of Site:	20 acres	25 acres
Area of Factory:	80,000 square feet	50,000 square feet
Equipment:	Line 1 Geomembrane Extruder Line 2 Geomembrane Extruder Line 3 Geomembrane Extruder Line 4 Geomembrane Extruder Line 5 Geonet Extruder/Lamination Facility for Geocomposite Production. Pipe Extruder-1 Welding Rod Extruders – 8 lines	Line1Geomembrane Extruder Pipe Extruder- 1
Personnel:	70	15
Production Capacity:	Total USA – 131,000,000 lbs/year	
Laboratory:	Fully equipped Geosynthetic Research Institute accredited laboratory for 17 ASTM test methods relating to the geomembrane production.	

Paul Barker PW

Date: May 29, 2008

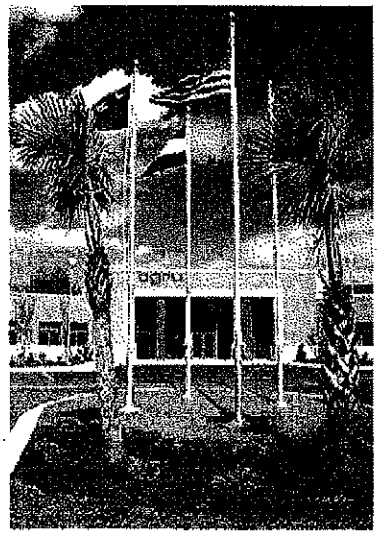
Paul W. Barker, Technical Director

For more than 30 years in Europe, Agru has been at the forefront of thermoplastic technology producing a wide range of pipes and fittings for the construction, chemical, and environmental industries. High quality sheeting of HDPE has been produced since 1986 on the most modern production equipment available and has been supplied to over 80 countries.

Agru America's production facility is located in Georgetown, South Carolina where an extrusion calendaring process produces the industry's finest quality HDPE and LLDPE geomembrane products.

Product and service excellence has assured Agru's expanding role as a top quality supplier of products, whose high performance is essential to the success of each project requiring such material.

To learn more about Agru's parent company, Agru Austria, please visit www.agru.at.



Hallaton 40 LL Microspike Projects

O/A	Customer	Thickness	Quantity/SF Application
07759	Hallaton Hanes Road LF Hallaton Towson, MD	40 LL Micro	966,000 Landfill
08421	Hallaton, Inc. Shamrock Environmental Johnston County Landfill Smithfield, NC Hallaton, Inc. Towson, MD	40 LL Micro	587,535 Landfill
08467	Thalle Construction, Inc. Tuscarora Landfill New Bern, NC Hallaton Towson, MD	40 LL Micro	1,072,260 Landfill
08840	Hallaton, Inc. American Infrastructure, Inc. Quarantine Road Landfill Baltimore, MD Hallaton, Inc. Towson, MD	40 LL Micro	27600 Landfill
09814	Thalle Horry County Landfill Conway, SC Hallaton Towson, MD	40 LL Micro	13782 Landfill
09862	Hallaton, Inc. c/o Whiting and Turner Baltimore, MD Hallaton, Inc. Towson, MD	40 LL Micro	727260

6 Projects = 3,394,437 SF

INSTALLATION MANUAL

Agru America, Inc. is not an installer of Geosynthetics and does not represent as such. This manual has been developed only as a guideline and not meant as an authority of exactitude. Agru America will not be held liable for the installation of others.

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10-02

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Daily Progress Report

Subgrade Surface Acceptance

Certificate of Acceptance

1.0 GEOSYNTHETIC INSTALLATION

1.1 Anchor Trench Systems

All Anchor Trench Systems shall be excavated by the Earthwork Contractor (unless otherwise specified) in accordance with the lines and widths shown on the contract drawings, prior to geosynthetic placement.

If the anchor trench is excavated in clay susceptible to desiccation, no more than the amount of trench required for the geosynthetics to be anchored in one (1) day will be excavated (unless otherwise specified) to minimize desiccation potential of the anchor trench clay soils.

The corners of the trench where the geosynthetics enter the trench should be slightly rounded to avoid sharp bends in the geosynthetics. No large rocks or clay lumps will be allowed to underlie the geosynthetics in the anchor trench.

Backfilling of the anchor trench will be conducted in accordance with Section 1.5.

1.2 Geosynthetic Placement

Immediately prior to installation of any geosynthetics, the surface will be inspected by Agru America, Inc. and the owner or the owner's representative. The decision to repair cracks, if any, will be made only by the owner's representative. The subgrade will be walked by Agru America, Inc. and the Project Manager for joint approval. Agru America, Inc. will sign acceptance of the surface condition of the subgrade. The integrity of the underlying soil is the responsibility of the owner/earth work contractor.

Subgrade Preparation Recommendations

No geosynthetics will be placed on surfaces not previously found acceptable by the Agru America, Inc. supervisor or his agent.

No sharp stones or other hard objects that could penetrate the geosynthetics will be present in the top 1 inch (1") (2.5 cm) of the surfaces to be covered.

Surfaces to be lined shall be smooth and free of all rocks, sharp stones, sticks, roots, and sharp objects, or debris of any kind. The surface should provide a firm, unyielding foundation for the geosynthetic with no sudden, sharp or abrupt changes or break in grade.

1.2.A Geomembrane Placement

1.2.A.1 Installation Schedule

Field panels are placed only after the subgrade has been accepted by Agru America, Inc. and the Project Manager. Agru America, Inc. takes responsibility only for accepting the surface conditions of the subgrade.

Field panels are placed one at a time, and each field panel will be seamed immediately after its placement.

1.2.A.2 Location

Field panels are located by the Agru/America, Inc. Field Supervisor in a manner consistent with the specifications and in a manner best suited to existing site conditions (i.e., a field panel is a roll or a portion of roll cut in the field).

At the time of installation, the Agru America, Inc. Field Supervisor will give each field panel an "identification code" (alpha or alphanumeric). This identification code will be agreed upon by the Project Manager. This field panel identification code will be as simple and logical as possible.

Agru America, Inc. will record the identification code, roll number, and date of installation of each geomembrane field on the Daily Progress Report. Daily Progress Reports are to be submitted to project manager the day following production or as agreed upon prior to installation.

1.2.A.3 Field Panel Identification

A field panel is the unit area of geomembrane that is to be seamed in the field.

At the time of installation, Agru America Inc.'s Supervisor will give each field panel an "identification code" (alpha or alphanumeric). This identification code will be agreed upon by the Project Manager. This field panel identification code will be as simple and logical as possible.

Agru America, Inc. will record the identification code, roll number, and date of installation of each geomembrane field on the Daily Progress Report. Daily Progress Reports are to be submitted to project manager the day following production or as agreed upon prior to installation.

1.2.A.4 Weather Conditions

Neither welding nor placement of geomembrane will take place during any precipitation, in the presence of excessive moisture, blowing dust, in the presence of high winds, or in areas of standing water, unless necessary precautions can be taken.

1.2.A.5 Method of Placement

Agru America, Inc. will verify the following:

- ◊ Any equipment used does not damage the geomembrane by handling, trafficking, excessive heat, or other means;
- ◊ The prepared surface underlying the geomembrane has not deteriorated since previous acceptance and is still acceptable immediately before geosynthetic placement;
- ◊ Construction equipment used to deploy geomembrane should not create excessive rutting in the subgrade;

- ◊ The method used to place the panels minimizes wrinkles (especially differential wrinkles between adjacent panels);

- ◊ If the substrata is a geosynthetic material, deployment may be by hand, by use of small jack lifts on pneumatic tires having low ground contact pressure, or by use of all-terrain vehicles (ATV's) having low ground contact pressure;

- ◊ Any geosynthetic elements immediately underlying the geomembrane are clean and free of debris;

- ◊ No personnel working on the geomembrane will smoke, wear damaging shoes, or engage in other activities that could damage the geomembrane;

- ◊ The method used to unroll the panels does not cause scratches or crimps in the geomembrane and does not damage the supporting soil;

- ◊ Adequate temporary loading and/or anchoring (e.g., sand bags, tires), not likely to damage the geomembrane, has been placed to prevent uplift by wind (in case of high winds, continuous loading, e.g., by adjacent sand bags, or soil is recommended along edges of panels to minimize risk of wind flow under the panels);

- ◊ Direct contact with the geomembrane is minimized; i.e., the geosynthetic(s) are protected by geotextiles, extra geomembrane, or other suitable materials in areas where excessive traffic may be expected;

- ◊ In the case of high density conductive geomembrane, the electrically conductive layer should be placed conductive side down, and;

- ◊ Agru America, Inc. shall inform the Project Manager if the above conditions are not fulfilled.

1.2.A.6 Damage

Agru America, Inc. will inspect each geosynthetic after placement and geomembrane prior to seaming for damage. Agru America, Inc. will advise the Project Manager which panel or portions of panels should be repaired as required. Damaged panels or portions of damaged panels that have been rejected will be marked and their removal from the work area recorded by Agru America, Inc. Repairs to geomembrane will be made according to procedures described in Section 1.4.A.2.

1.2.B Geotextile and Geonet Placement

Geotextile and geonets will be handled in such a manner as to ensure they are not damaged in any way.

On slopes, geotextiles and geonets will be anchored in the anchor trench; then rolled down the slope in such a manner as to continually keep the material in tension.

In the presence of wind, the materials will be weighted with sandbags until final covers are installed.

Care will be taken to assure that any underlying layers are not damaged during placement of geotextiles and geonets.

Care will be taken to assure that stones, mud and dirt and not entrapped in the geotextile and geonet during placement and seaming operations.

Cutting and trimming of product placed on top of the liner must be done with hooked blade knives.

1.2.C Geosynthetic Clay Liner (GCL) Placement

The geosynthetic clay liner must be installed in general accordance with the manufacturer's specification and in such a way as to prevent any damage to the GCL.

One method of installing a GCL is to utilize a piece of equipment such as a front-end loader or forklift that is capable of lifting the GCL. A spreader bar is attached to the lifting equipment, and a core bar is installed through the GCL core. Straps or other types of attachments are looped over the core bar and the spreader bar. The equipment then lifts the GCL above the subgrade soils and while backing away from the initial starting point unrolls the GCL roll. This method can be used to install a membrane-backed GCL with the bentonite side up or side down.

For GCL's with a geomembrane backing, an alternate method for installing the GCL with the membrane facing against the soil is to attach a ten foot (10') 3m) long bar clamp to the end of the roll. The upper clamp has a chain attachment that can easily fit over a trailer hitch that is on a truck or other type of equipment. The GCL is then pulled across the subgrade soils. If the membrane is textured, then rub sheets should be used.

Folds in the GCL must be "stretched out" prior to installation of any overlying geosynthetics or soils. If these folds cannot be removed by realignment of the GCL, then these folds must be "cut" from the GCL and patched according to the manufacturer's specifications.

1.3 Geosynthetic Seaming and Joining

1.3.A Geomembrane Seaming

See Section 2.0 for more guidance.

1.3.A.1 Seam Layout

Seams will be made by overlapping adjacent sheets approximately three inches (3") (7.5 cm) for extrusion welding and approximately four to six inches (4"-6") (10 cm-15cm) for fusion welding.

In general, seams should be oriented parallel to the line of maximum slope; i.e., oriented along and not across, the slope. For corners and odd-shaped geometric locations, the number of seams should be minimized.

A seam numbering system compatible with a panel numbering system will be agreed upon at the Pre-Construction Meeting.

1.3.A.2 Seaming Equipment and Products

The approved processes for field seaming are extrusion welding and fusion (hot wedge) welding. Proposed alternate processes shall be documented and submitted to the Owner or his representative for approval.

The extrusion welding apparatus shall be equipped with gauges giving the temperature of the apparatus.

The fusion-welding apparatus must be an automated device that produces a double seam with an enclosed space or solid seam on thin mil material as specified.

The fusion welding apparatus shall be equipped with gauges giving the applicable temperature and speed settings.

Agru America, Inc. shall verify that:

◊ Equipment used for seaming is not likely to damage geomembrane;

◊ The extrusion welder is purged prior to beginning a seam until all heat-degraded extrudate has been removed from the barrel;

◊ The electric generator, if utilized, is placed on a smooth base such that no damage occurs to the geomembrane;

◊ Buffing the geomembrane to remove waxes and oxides will be completed no more than one (1) hour prior to extrusion welding (buffing is not necessary for hot wedge welding).

1.3.A.3 Seam Preparation

Agru America, Inc. shall verify that:

◊ Prior to seaming, the area is clean and free of moisture, dust, dirt, and foreign material of any kind;

◊ Seams are aligned with the fewest possible number of wrinkles and "fishmouths".

1.3.A.4 Weather Conditions for Seaming

The high temperature limit for welding is based on two factors:

(1) The well being of the crew. Black lining material will get very hot when exposed to sunlight. It is possible that the elevated sheet temperature in conjunction with immoderate ambient conditions could place the well being of the crew at risk.

(2) Material Capability. The highest temperature at which the materials can be properly welded is dependent upon such things as ambient temperature, wind, subgrade conditions, exposure to sunlight, material type, and material thickness to name a few.

Thinner materials and low-density products are the most difficult to seam at high liner temperatures. The problem typically is characterized by frequent burnouts (places in the weld where the rollers lose traction and the machine stops moving causing the wedge to burn through the liner). The number of burnouts can often be reduced by increasing the speed and/or decreasing the wedge temperature until a quality weld with a minimum number of burnouts is attained. The sheet temperature may reach a point at which the supervisor determines there are an excessive number of burnouts at which time the supervisor will order welding to stop.

In some areas of extreme temperature conditions, the supervisor may determine it would be more advantageous to work at night under artificial light, or split the workday to utilize the cooler morning and late evening hours.

The lowest allowable temperature at which welding may be permitted is also dependent upon conditions such as ambient temperature, wind, subgrade conditions, exposure to sunlight, material type, and material thickness. Typically cold weather welding may proceed by reducing welding speeds and/or increasing wedge temperature. Pre-heating the sheet in advance of the welding apparatus may also be done by using a hot air blower.

Whenever temperatures become cold, increased attention should be given to pre-weld destructive samples (Section 1.3.A.5). In cold conditions it is even more critical that these trial welds be performed under the same conditions that will be seen during actual seaming.

The lowest temperature at which welding may take place is the lowest temperature at which consistent passing trial seams can be performed under actual seaming conditions. In order to obtain passing results, it may be necessary to preheat the sheet in advance of the welder and/or shield the welding apparatus and the seaming area from wind.

In all cases, the geomembrane will be dry and protected from the wind.

Agru America, Inc. will verify that these adjustments for various weather conditions are fulfilled and will advise the Project Manager if they are not. The Project Manager will then decide if the installation will be stopped or postponed.

1.3.A.5 Trial Seams

Trial seams shall be made on fragment pieces of geomembrane liner to verify that the seaming equipment and conditions are adequate. Such trial seams will be made at the beginning of each seaming period (start of day, midday, and anytime equipment is turned off and allowed to cool down) for each seaming apparatus used. Trial seams shall be made under the same conditions as actual seams.

The trial seam sample shall be approximately three feet (3'/1.0m) long by one foot (1'/0.3m) wide for extrusion and six feet (6'/2.0m) long by one foot (1'/0.3m) wide for fusion welds with the seam centered lengthwise. Seam overlap shall be nominally three inches (3"/7.5cm) for extrusion welds and four to six inches (4"-6"/10cm-15cm) for fusion welds.

Two adjoining specimens each one inch (1"/2.5cm) wide, will be cut from the trial seam sample by the installer. The specimens will be tested respectively in shear and peel using a field tensiometer, and they should not fail in the seam. If a specimen fails, the entire operation will be repeated. If the additional specimen fails, the seaming apparatus and procedures will not be accepted and will not be used for seaming until the deficiencies are corrected and two consecutive successful full trial welds are achieved.

1.3.A.6 General Seaming Procedure

Unless otherwise specified, the general seaming procedure used by Agru America, Inc. shall be as follows:

- ◊ The rolls of membrane will be overlapped by approximately four to six inches (4"-6"/10cm-15cm) for fusion welding and three inches (3"/7.5cm) for extrusion welding. Seaming strength is not a function of the overlap. The overlap simply needs to be wide enough to weld and test properly.

- ◊ "Fishmouths" or wrinkles at the seam overlaps will be cut along the ridge of the wrinkle in order to achieve a flat overlap. The cut "fishmouths" or wrinkles will be seamed and any portion where the overlap is inadequate will be repaired in accordance with the repair procedures described in Section 1.4.A.2.

- ◊ Seaming will extend up the panels and well into the anchor trench.

- ◊ For fusion welding on damp or muddy subgrade, a movable protective layer of plastic may be required to be placed directly below the overlapped membranes being seamed. This is to prevent any moisture buildup between the sheets to be welded and/or to provide a more stable base on which the fusion welding device can travel.

1.3.A.7 Non-destructive Seam Continuity Testing

1.3.A.7.1 Concept

Agru America, Inc. will non-destructive test all field seams over their full length using a vacuum test unit, air pressure testing, or other approved method where applicable. The purpose of non-destructive tests are to check the seams for leaks. It does not provide information on seam strength or quality of bonding. Non-destructive testing will be carried out as the seaming progresses, not at the completion of a job.

1.3.A.7.2 Vacuum Testing

The equipment will be comprised of the following:

- ◊ A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole or valve assembly, and a gauge to indicate chamber vacuum;

- ◊ A rubber pressure/vacuum hose with fittings and connectors;

- ◊ A bucket and wide brush, mop or spray assembly;

◊ A soapy solution;

The following procedures shall be followed:

◊ Energize the vacuum pump;

◊ Wet a strip of geomembrane approximately twelve by 48 inches (12 x 48"/0.3m x 1.2m) with the soapy solution;

◊ Place the box over the wetted area;

◊ Close the bleed valve and open the vacuum valve;

◊ Ensure that a leak tight seal is created;

◊ For a period of approximately five to ten (5-10) seconds, examine the geomembrane through the viewing window for the propagation of soap bubbles;

◊ After five to ten (5-10) seconds, close the vacuum valve and open the bleed valve, move the box over the adjoining area with a minimum three inches (3"/7.5cm) overlap, and repeat the process;

◊ All areas where soap bubbles appear will be marked and repaired in accordance with Section 1.4.A, and;

◊ Vacuum tested seams are recorded on Daily Progress Reports.

1.3.A.7.3 Air Pressure Testing (For Double Fusion Seam Only)

The equipment shall be comprised of the following:

◊ An air pump (manual or motor driven) equipped with pressure gauge capable of generating and sustaining a pressure between 25 and 30 psi (160 and 200 kPa);

◊ A rubber hose with fittings and connections; and

◊ A hollow needle and clamp assembly shown in Figure 2.2, Section 2.1.F or other approved pressure feed device.

The following procedures will be followed:

◊ Seal both ends of the seam to be tested;

◊ Insert needle or other approved pressure feed device into the tunnel created by the fusion weld;

- ◊ Energize the air pump to a pressure between 20 and 30 psi (160 and 200 kPa), close valve, and hold pressure for approximately five minutes;
- ◊ If loss of pressure exceeds the values listed below, or does not stabilize, locate faulty area and repair in accordance with Section 1.4.A;
- ◊ Release air pressure by puncturing seam to assure there is no blockage in the air channel and verify that the full seam has been pressurized;
- ◊ Remove needle or other approved pressure feed device and seal, and;
- ◊ Pressure tested seams are recorded on Daily Progress Reports.

Table 1
PRESSURE TEST SPECIFICATION FOR DUAL TRACK FUSION WELDS IN HDPE AND LLDPE
Test Pressure (After 5 minutes) PSI (kPa)

Sheet Thickness Allowed	Minimum	Pressure Maximum	Drop
30 mil (0.75mm) (28 kPa)	15 (166)	20 (276)	4 PSI
40 mil (1.0mm) (28 kPa)	20 (166)	30 (276)	4 PSI
60 mil (1.5mm) (28 kPa)	24 (166)	30 (276)	4 PSI
80 mil (2.0mm) (28 kPa)	24 (166)	30 (276)	4 PSI
100 mil (2.5mm) & thicker (28 kPa)	24 (166)	30 (276)	4 PSI

1.3.A.8 Destructive Testing

1.3.A.8.1 Introduction

Destructive testing of seams is important because it provides direct evaluation of seam strength and bonding efficiency which indicates seam durability.

Destructive testing involves two techniques:

1. Shear Testing – Applies a tensile stress from the top sheet through the weld and into the bottom sheet and;

2. Peel Testing – Peels the top sheet back against the overlapped edge of the bottom sheet in order to observe how separation occurs. The peel test indicates whether or not the sheets are continuously and homogeneously connected through the seam.

1.3.A.8.2 Location and Frequency

Destructive seam tests will be performed at random selected locations. The owner and/or owners' representative will select locations where destructive samples will be cut.

A frequency will be agreed upon by Agru America, Inc. and the Project Manager at the Pre-Construction Meeting. Unless otherwise specified, destructive samples should be pulled at intervals of one (1) sample for every 500 linear feet of weld.

The seaming technician will not be informed in advance of the locations where the seam samples will be taken.

1.3.A.8.3 Sampling Procedure

Samples will be cut by Agru America, Inc. as the seaming progresses. When cutting samples above an existing geomembrane, hook blade knives should be used.

A number will be assigned to each sample which is to be based upon seam and sample number and mark it accordingly.

Destructive sample locations will be recorded on a daily report and on the as-build drawing; and

All holes in the geomembrane resulting from destructive seam sampling will be immediately repaired in accordance with repair procedures described in Section 1.4.A.

1.3.A.8.4 Size of Samples

At a given sampling location, two (2) coupons for field testing should be taken. Each of the coupons will be one inch (1"/2.5 cm) wide by twelve inches (12"/0.3m) long with the seam centered parallel to the length. The distance between these two (2) coupons will be twelve inches (12"/0.3m).

If both coupons pass the field test described in Section 1.3.A.9.5, a sample will be cut between the two (2) coupons. The sample will be cut into three (3) parts and distributed as follows:

- ◊ Two (2) one inch (1"/2.5 cm) wide strips will be tested in the field for peel and shear and will not fail in the seam. If seam strengths are being evaluated, samples should be cut with a die to provide proper geometry.

- ◊ If any field test samples fails to pass, then the procedures outlined in Section 1.3.A.9.6 will be followed.

- ◊ If the initial sample coupon test passes with Film Tear Bond (FTB) (see Figures 2.5 and 2.5 in Section 2.0), the sample is considered passing unless by specification, requires further testing to obtain quantitative results per Table 3. If it fails, the seam should be repaired in accordance with Section 1.4.A.

1.3.A.8.5

Electric or hand tensiometer destructive testing is to be carried out in the field. Testing procedure is as follows:

◊ Two (2) one inch (1"/2.5 cm) wide strips will be tested in the field for peel and shear and will not fail in the seam. If seam strengths are being evaluated, samples should be cut with a die to provide proper geometry.

◊ If any field test samples fail to pass, then the procedures outlined in Section 1.3.A.9.6 will be followed.

◊ If the initial sample coupon test passes with Film Tear Bond (FTB) (See Figures 2.5 and 2.6 in Section 2.0), the sample is considered passing unless by specification, requires further testing to obtain quantitative results per Table 3. If it fails, the seam should be repaired in accordance with Section 1.4.A.

Table 2
Seam Strength Requirements are according to GRI -GM19.
(See www.geosynthetic-institute.org/grispecs/gm19.pdf)

1.3.A.8.6 Procedures for Destructive Test Failure

The following procedures will apply whenever a sample fails a destructive test. Agru America, Inc. has two options:

1. Reconstruct the seam between any two passed test locations.

2. Trace the welding path to an intermediate location ten feet (10'/3m) minimum from the point of the failed test in each direction and take a small sample coupon for an additional field test at each location. If these additional samples pass the field test, then full samples are taken. If these samples pass the tests, then the seam is reconstructed between these locations. If either sample fails, then the process is repeated to establish the zone in which the seam should be reconstructed.

All acceptable seams must be bounded by two (2) locations from which samples passing destructive tests have been taken or entire seam is capped.

Agru America, Inc. will document all actions taken in conjunction with destructive test failures; e.g., capping of failed seam area.

1.3.B Geotextiles, Geonets, and Geocomposite Joining

1.3.B.1 Geotextiles

Geotextiles may be installed by overlapping, by thermally bonding on a spot or continuous basis, or by sewing as specifications dictate.

If sewing is required, the thread used will be a polymeric material with chemical resistance similar to the geotextile.

1.3.B.2 Geonets

Geonets may be butt joined or lapped if specified. Nylon/plastic cable ties will be applied to the net edge at five foot (5'/1.5m) intervals along the edge.

End splices will be made as follows:

1. On slopes, the ends will overlap two feet (2'/0.6m) with uphill panels on top and two (2) rows of cable ties applied.

2. In flat areas, the ends will overlap a minimum to two inches (2"/5 cm) and one (1) row of three (3) cable ties applied.

1.3.B.3 Geocomposites

Geocomposites can be overlapped with the net portion tied and the geotextile portion thermally bonded or seamed as required by the project specifications.

1.3.C. Geosynthetic Clay Liner (GCL) Joining

Seaming of GCL's is achieved by simply overlapping the GCL panels. Care must be taken in order to determine if any loose bentonite should be spread between the overlap.

Alternately, the geomembrane backing can be welded in accordance with the membrane and GCL manufacturer specifications.

1.4 Geosynthetic Repair Procedures

1.4.ADefects and Repairs of Geomembrane

1.4.A.1 Identification

All seams and non-seam areas of the geomembrane will be examined by Agru America, Inc. for identification of defects, holes, blisters, undispersed raw materials and any sign of contamination by foreign matter.

Defective/damaged materials will be identified via a deficiency report, either separately or on the Daily Report. Actions taken to resolve or correct the problem will also be recorded on the similar form.

Defects, holes, blisters, undispersed raw materials, signs of contamination by foreign matter, unacceptable welds in geomembranes and other unsatisfactory conditions will be identified. The repair/corrective action to repair the problem will also be recorded.

1.4.A.2 Repair Procedures

Any portion of the geomembrane failing a destructive test will be repaired. Several procedures exist for the repair of these areas. The final decision as to the appropriate repair procedure will be agreed upon between the Project Manager and Agru America, Inc.

The procedures available include:

- ◊ Patching – Used to repair holes, tears, and contamination by foreign matter;
- ◊ Buffing and re-welding – Used to repair small sections of extruded seams;
- ◊ Spot welding or seaming – Used to repair pinholes, or other minor localized flaws;
- ◊ Capping – Used to repair large lengths of failed seams; and
- ◊ Topping – Used to repair areas of inadequate seams which have an exposed edge.

In addition, the following provisions will be satisfied:

Surfaces of the geomembrane which are to be repaired will be abraded no more than one (1) hour prior to the repair;

All surfaces must be clean and dry at the time of the repair;

All seaming equipment used in repairing procedures must be approved;

Patches or caps shall extend beyond the edge of the defect, and all corners of patches will be rounded with a radius.

1.4.A.3 Repair – Non-destructive Testing

Each repair will be non-destructively tested using the methods described in Section 1.3.A.7.2 as appropriate. Repairs which pass the non-destructive test will be taken as an indication of an adequate repair. Failed tests indicate that the repair will be redone and re-tested until a passing test result is obtained.

1.4.B Geotextile, Geonets, and Geocomposite Repairs

Any holes, tears, or burn throughs from thermal seaming in geotextiles will be repaired by patching with the same geotextiles. The patch will be a minimum of twelve inches (12"/30cm) larger in all directions than the area to be repaired and will be spot bonded thermally.

Any holes or tears in geonets will be repaired by patching with the same geonet. The patch will be a minimum of twelve inches (12"/30cm) larger in all directions than the area to be repaired. The patch will be tied in place using a minimum of four (4) nylon cable ties.

1.4.CGeosynthetic Clay Liner (GCL) Repair Procedures)

GCLs will be inspected for cuts, tears, or areas of bentonite loss.

The area to be repaired (patched) must be free of contamination by foreign matter. Patches must have a twelve inch (12"/30cm) overlap around the damaged area. For fabric-encased GCLs the patch is to be tucked into place with excess bentonite poured over the overlap.

1.5 Backfilling of Anchor Trench

The anchor trench, if any, will be adequately drained by Owner/Earthwork Contractor to prevent ponding or otherwise softening of the adjacent soils while the trench is open. The anchor trench will be backfilled by the Earthwork Contractor or as outlined in the specifications and bid documents.

Since backfilling the anchor trench can affect material bridging at toe of slope, consideration should be given to backfill the liner at its most contracted state; preferably during the cool of the morning or extended period of overcast skies. Care shall be taken when backfilling the trenches to prevent any damage to the geosynthetics.

1.6 Lining System Acceptance

The geosynthetic lining system will be accepted when:

- ◊ The installation of materials are deployed and welded; and
- ◊ Verification of the adequacy of all seams and repairs including associated testing is complete.

1.7 Soils in Contact with the Geomembrane

Important points for quality assurance of soils in contact with geomembranes include:

- ◊ A geotextile or other cushion approved by the designer may be installed between angular aggregate and the geomembrane;
- ◊ Equipment used for placing soil will not be driven directly on the geomembrane;
- ◊ A minimum thickness of one foot (1'/0.3m) of soil is recommended between a light dozer (such as a CAT D-3 or wide track caterpillar D-6 or lighter) and the geomembrane; and
- ◊ In areas of heavy traffic such as access ramps, soil thickness should be at least two to three feet (2-3'/0.6-0.9m).

<u>Soil/Earth Cover on Top of Geomembrane</u>

Placement of soil (sand or other types of earth) cover on top of the liner will not be performed until all destructive and non-destructive testing has been performed and accepted.

Placement should be performed to minimize wrinkles. Equipment operators should be briefed on method and timing of soil placement to deal with the affects of thermal expansion and

contraction of the liner. Soil placement during cooler part of the day minimizes wrinkle problems.

Material placed on top of the liner should be back-dumped on liner and, in order to avoid the formation of wrinkles, efforts should be made to load the soil so that it comes down on top of the liner rather than being pushed across the sheet. This is done by:

1. Using a front-end loader to place soil ahead of spreading soil cover; and

2. Spreading soil by building a mound at the edge of soil, then pushing soil up and over the mound causing it to come down on the liner.

If a wrinkle forms, every effort should be made to walk the wrinkle out.

Minor folding over of wrinkles is acceptable providing an even transition occurs at the tail of the wrinkle. If excessive stress points are created at the tail of the wrinkle, the wrinkle should be cut out and repaired per Section 1.4.A.

2.0 WELDING SYSTEM DETAILS

2.1 Details of Fusion Welding System

2.1.A. Introduction

The fusion welding system is the primary seaming system for geomembrane installation and the extrusion welding system is utilized for repairs and detail work.

The fusion welding apparatus is self-propelled and produces a double seam with an enclosed air channel for testing. A single wedge may be made available for very thin materials on special request (certain lead times in obtaining this equipment may apply).

The wedge itself contains two cartridge style heaters and its temperature is controlled by a closed loop feedback controller using a thermocouple positioned in the wedge. This maintains the wedge temperature typically to within ± ten degrees Centigrade (10° C) of the setpoint temperature during welding.

In addition to these electronic devices, a great deal of care has been taken to assure that the mechanical design is as self-adjusting and trouble free as possible. The wedge for example is free floating and pivots about the same axis as the drive rollers. This means that no wedge position adjustments must be made for welding materials of different thickness. Also, the drive system consists of totally enclosed gears, chains, and shafts which need no adjustments and are protected from the environment.

2.1.B Geomembrane Preparation

◊ Correct performance of the welder requires that the geomembrane be brought to its exact plan position for final installation and seaming.

- ◊ The two (2) geomembrane panels to be joined must be properly positioned such that approximately four to six inches (4-6"/10-15 cm) of overlap exists.

- ◊ If the overlap is insufficient, lift up the panel to allow air beneath it and "float" it into proper position. Avoid dragging sheets, particularly when they are on rough soil subgrades.

- ◊ There should be no excessive undulations (waves) along the seams during the seaming operation. When excessive undulations are present they often lead to the undesirable formation of "fishmouths" which must be trimmed, laid flat, and reseamed via a patch.

- ◊ There will generally be slack in the geomembrane depending on the ambient temperature, length of exposure time, etc.

- ◊ The sheets which are overlapped for seaming must be clean.

- ◊ The sheets which are overlapped for seaming must be free of moisture in the area of the seam.

- ◊ Seaming is not allowed during rain or snow, unless the seam is covered with an enclosure.

- ◊ The soil beneath the geomembranes should not be frozen. The heat of seaming can thaw the frost allowing water to be drawn into the region to be joined. Seaming over frozen soil, however, can be accomplished with rub sheets of geomembrane directly under seam edges.

- ◊ Ambient temperatures for seaming should be above freezing i.e. thirty-two degrees Fahrenheit (32° F/0°C). However heat seaming below thirty-two degrees Fahrenheit (32°F/0°C) can proceed with caution as stated in the next item and in Section 1.3.A.4.

- ◊ For cold weather seaming, it may be advisable to preheat the sheets with a hot air blower, to use a shield of some sort to prevent heat losses during seaming, and to prepare more test welds in order to determine appropriate seaming conditions (e.g. equipment temperatures should be set higher and seaming rates slowed down during cold weather seaming). For further guidance see Section 1.3.A.4.

2.1.C Equipment Preparation

- ◊ A working and properly functioning power source must be available within close proximity of the seaming region. If a generator is utilized, rubber tires must be used, or a smooth plate placed under the generator such that it is completely stable so that no damage can occur to the geomembrane. Fuel (gasoline or diesel) for the generator should be stored off the geomembrane.

- ◊ As the fusion method is one of melting the opposing surfaces of the two (2) geomembrane panels to be joined, no grinding of the geomembrane sheets is necessary, nor allowed.

- ◊ Tacking of the geomembrane panels, as done in extrudate fillet seaming, is not needed.

- ◊ The wedge itself should be inspected to see that it is uniform and reasonable tapered. Various types are currently available. Some are smooth surfaced while others have patterned ridges in the direction of the seam. The taper dimensions vary according to different types of machines. The major point for inspection is that no sharp edges should exist where geomembrane sheet surfaces must pass.

- ◊ Nip rollers for applying pressure on the sheets and driving the device (most often knurled rollers) follow the wedge. They should be inspected for sharp surfaces or excessive wear.

- ◊ For a dual, or split seam, the recessed space for the air track should be examined.

- ◊ As the geomembrane panels pass through the machine, they must properly come in contact with the wedge. Fusion welding machines are equipped with pressure shoes or rollers which assure contact between the sheet and the wedge as the material passes through the machine. Once the welding machine has been set up for a particular thickness, further field adjustments are not required.

- ◊ The front part of the seaming device should be inspected for sharp corners and irregular details which may damage the geomembrane.

- ◊ Temperature controllers on the fusion device should be checked periodically.

2.1.D Seaming Process

The fusion system is properly positioned for the making of a dual (split) seam.

The principle of fusion welding is that both surfaces to be fused come into intimate contact with the hot wedge, or anvil. The wedge lifts up both overlapped panels off the subgrade and fusion is brought about by compressing the two molten surfaces of the sheet together, causing an intermingling of the polymers.

Figure 2.1

- ◊ Temperature, speed, and nip force will vary according to the geomembrane thickness being installed.

- ◊ Ambient factors such as clouds, moisture, and hot sun may require the temperature and/or speed setting of the wedge to vary. A test strip should be run before welding begins, which will enable the operator to find the proper settings for the particular conditions that day. See Section 1.3.A.5.

- ◊ After placing the machine into the overlapped sheet of material, pick it up a few inches, loading the bottom sheet first, and then the top sheet between the wedge and respective pressure shoe/roller. When top and bottom sheets are loaded, engaging the nip rollers will secure the position of sheet and wedge and start the welding.

◊ It is necessary that the operator keep constant visual contact with the temperature controls, and the completed seam coming out of the machine. Occasional adjustments of speed may be necessary to maintain a consistent weld.

◊ Occasionally on some soils, the wedge tends to "bulldoze" into the ground as it travels. This causes soil to enter the weld making the seam weak and unacceptable. To overcome this, it is recommended that the operator take some of the weight off the front of the machine by lifting it slightly. Alternatively, some type of base for the machine to travel on could be provided. Strips of geotextile or geomembrane ("rub sheets") have proven effective to prevent this bulldozing effect.

2.1.E After Seaming

◊ A smooth insulating plate or heat insulating fabric is to be placed beneath the fusion welding apparatus after use.

◊ A slight amount of "squeeze-out" or "flashing" in the weld is a good indicator that the proper temperatures were achieved. Some melted polymer laterally extruded out of the seam zone indicates a proper seam.

◊ Nip/drive roller marks will always show on the surface and will be just barely evident to the touch.

◊ The fusion device requires only a few adjustments, but it is very important that they be checked daily. Cleaning of machine should be done frequently, and at least daily.

2.1.F Dual Track Fusion Air Pressure Testing

General

The automatic fusion seaming machine creates two distinct seams. These two seams are separated by a void or air space. This seam design is intentional for two reasons. First, it allows a very positive test for leak integrity, and second, the double weld seam offers both a primary and a secondary seal for the seam.

Air Pressure Test Procedure: (More Information in Section 1.3.A.7.3)

1. Seal one end of the seam by applying heat to the end of the seam, via hot air gun, until "flow temperature" is achieved.

2. Clamp off end using hand vise gripper or tape used for this purpose.

3. A pressure gauge/needle assembly is inserted into void or air channel.

4. Air pressure is then applied into the air channel with the use of an air pump per the following schedule:

Table 3
Initial Pressure Schedule

Material	Field Testing Minimum PSI	Maximum PSI
30 mil	15	30
40 mil	20	30
60 mil	24	30
80 mil	24	30
100 mil	24	32

5. Pressure test seams according to the initial pressure test schedule. Hold test for five minutes. If no pressure drop is greater than the maximum allowable pressure drop the seam is judged leak free.

Table 4
Maximum Allowable Pressure Drop

Material	Field Test (after five minutes)
30 mil	4 PSI (28 kPa)
40 mil	4 PSI (28 kPa)
60 mil	4 PSI (28 kPa)
80 mil	4 PSI (28 kPa)
100 mil	4 PSI (28 kPa)

Note: At all times before heat sealing the end of the seam, the operator should insure that the void or air channel is free of obstruction.

6. On completion of the test, the air channel should be cut open. The pressure gauge reading should immediately drop to zero indicating that the air channel was continuous and unblocked.

FIELD SEAM FAILURE

Should failure occur through excessive leak down over the scheduled time period, check both ends of seam to insure proper seal and re-test. Should failure reoccur, check the top fusion seam by applying a constant flow of air pressure to void air channel. Mix a strong solution of liquid detergent and water and apply an ample amount to the top fusion weld. Any failure or leak will be indicated by continuous bubbles appearing.

If no failure appears in the top fusion seam area, check systematically by isolating random sections of the seam. This should be accomplished in 150 linear foot 45m) long sections of seam. Then re-test each section by pressure testing until the leak is located. Repair failed seam area by extrusion welding the outside edge of the top fusion weld between areas of failure. Then vacuum test repaired seam. All repairs in accordance with Section 1.4.A.

2.1.G. Peel Test for Fusion Seam Weld

For more information see Section 1.3.A.9

Procedure:

1. Cut specimen approximately one inch wide by approximately six inches long (1 x 6"/2.5 x 15cm).

2. Only one track is peeled apart in this destructive test. The other track is for the purpose of air pressure testing capabilities.

3. Clamp bottom tabs into the testing machine (Field or Lab Tensiometer). Turn on machine and pull the seam (See Figure 2.3).

4. All testing of destructive samples of fusion seam will be in accordance with ASTM D4437 which references ASTM 413 for peel.

Passing results for a seam are determined to be FTB per the chart titled, Destructive Testing of Dual Hot Wedge (See Figure 2.5).

Figure 2.3

2.2 Details of Extrusion Welding System

2.2.AIntroduction

The Fusion Welding System is the primary seaming system for geomembrane installation. The Extrusion Welding System is utilized for repairs and detail work. The Extrusion Welding System produces a seam quality equal to the Fusion Weld and has the advantage that all welds are applied on top of the geomembrane which allows its use at "T" intersections and in irregular seam areas such as pipe boots.

The extrusion welder will have two independent heating zones, each with its own closed loop temperature control system. These two zones are typically referred to as the nozzle and the extruder. The nozzle thermocouple is positioned approximately one inch (1"/2.5cm) from the end of the steel nozzle which rides on the sheet giving good control over the temperature of the molten polymer as it contacts the sheet. Some extrusion machines may only have one heating zone which is referred to as a shoe. This machine needs only one heater since there are no rotating tips.

The extruder and nozzle will be insulated to prevent excessive heat loss in cold and/or windy conditions as well as to provide a safe working environment for the operator.

When tested in peel the numerical values for weld strength of an extrusion weld will be slightly lower than for fusion welds. The lower value is the result of the weld bead on top of the liner changing the geometry of the load application in the tensile test and not an indication of inferior weld quality.

2.2.B Geomembrane Preparation

Geomembrane preparation is the same as described for the fusion weld, Section 2.1.B.

2.2.C Equipment Preparation

A working and properly functioning power source must be available within close proximity of the seaming region. If a generator is utilized rubber tires must be used, or a smooth plate placed

under the generator such that it is completely stable so that no damage can occur to the geomembrane. Fuel (gasoline or diesel) for the generator should be stored off the geomembrane.

The extrusion welder is a completely self contained system which requires no adjustments after it has been initially set up for a particular geomembrane thickness.

An initial inspection of the extrusion welder should be made before it is heated to confirm that the electrical cords, insulation and covers are in good condition and that the welding nozzle is correct for the geomembrane to be seamed.

The welding machine should be connected to a proper power supply and heated to the correct welding temperature for the geomembrane to be seamed.

After the unit has reached correct operating temperature, clean, dry welding rod should be inserted and the unit operated for several minutes to confirm that the temperature controllers are operating properly and that the welding rod feed system is operating properly.

The Teflon shoe(s) should be checked for excessive wear and replaced if necessary and they must be trimmed for proper control of the weld bead configuration

2.2.D Seaming Process

Geomembrane to be extrusion welded must have low molecular weight polymer (waxes) and surface oxidation removed by lightly grinding the weld surface. The grinding is performed parallel to the seam and controlled such that grinding marks do not extend more than 0.25 inches (6mm) outside the area of the weld bead. Grinding should precede the actual welding as closely as possible but in no case should grinding precede welding by more than one hour. 80 mil (1.5mm) or thicker geomembranes should have the edge of the top sheet beveled by grinding to approximately a 45° angle.

The geomembrane to be extrusion welded must be temporarily bonded to hold the material in place until the extrusion weld bead cools and attains full strength. Automatic or hand-held hot air tack welds are therefore applied prior to extrusion welding.

The extrusion welder barrel should be purged of all degraded polymer prior to the start of seaming.

The welding operation should be observed to assure that the weld bead is centered over the edge of the top overlapped sheet and that weld bead appearance is smooth and uniform.

All extrusion welds should be non-destructively tested by vacuum testing as described in Section 1.3.A.7.2.

Destructive tests, per 1.3.A.9 and Figures 2.4 and 2.6 are conducted when seam lengths are adequate.

REFERENCES

1. Mature, Inc., "Lining of Waste Containment and Other Impoundment Facilities", EPA/600/2-88/052, Sept. 1988.

2. ---, "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities", EPA,530-SW-86-031, Oct. 1986.

3. Haxo, H.E., Jr., "Quality Assurance of Geomembranes Used as Linings for Hazardous Waste Containment", Jour. Geotex and Geomemb., Vol. 3, No. 4, 1986, pp. 225-248.

4. Rosen, S. L., Fundamental Principles of Polymer Materials, J. Wiley and Sons, Inc., New York, 1982.

5. Koerner, G.R. and Bove, JA.; "Construction Quality Assurance of HDPE Geomembrane Installations, Proc. Geosynthetics '89, San Diego, CA, IFAI, pp. 70-83.

6. Koerner, R.M., Designing with Geosynthetics. 2nd Edition, Prentice Hall Publ. Co., Englewood Cliffs, NJ, 1990.

7. Struve, Fred, "Consistent Wedge Welders", Proc. 7th GRI Seminar, Dec. 14-15 1993, Philadelphia, PAA., pp. 9-23.

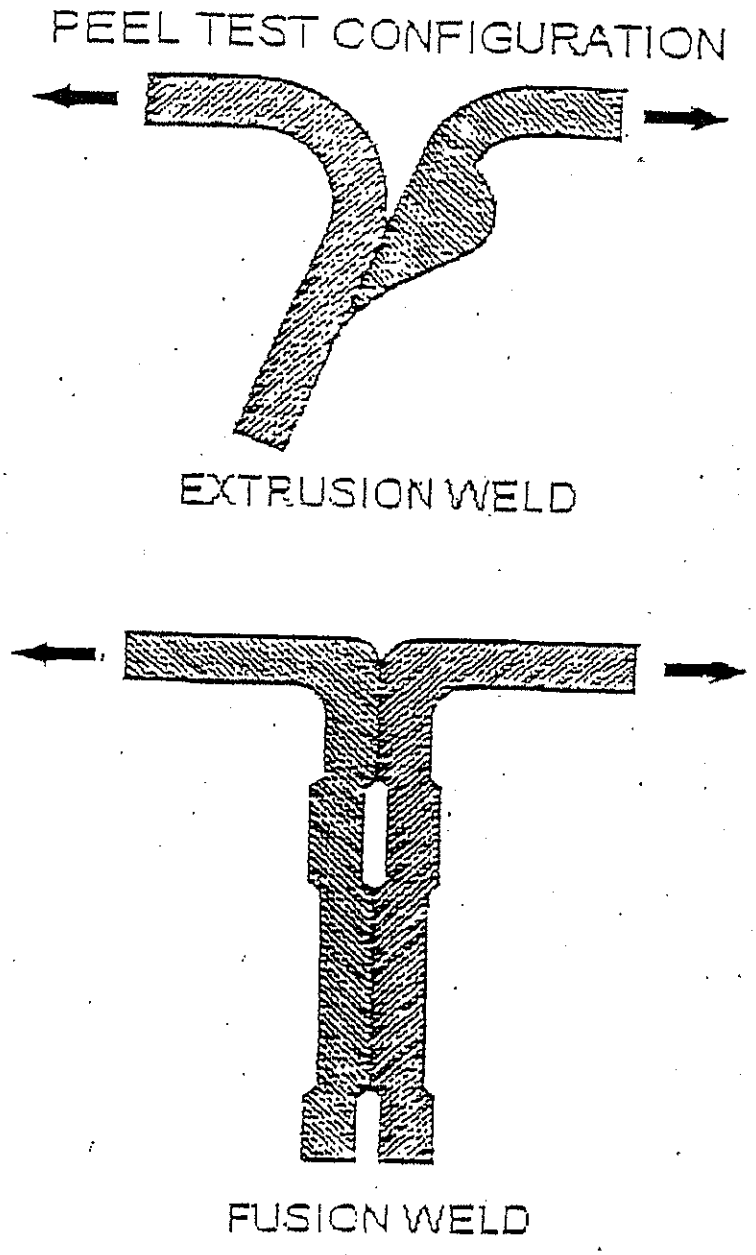
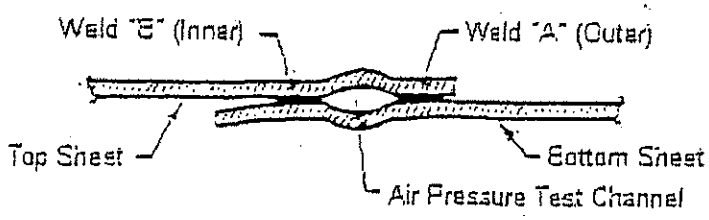


Figure 2.5

DESTRUCTIVE TESTING OF DUAL HOT WEDGE WELD

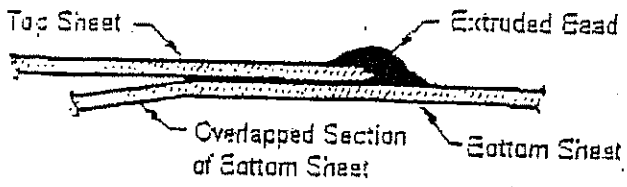


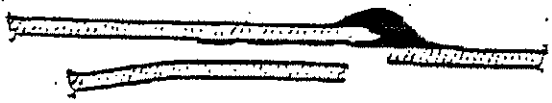
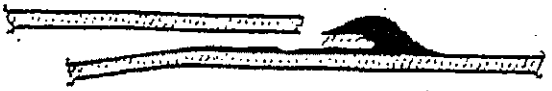
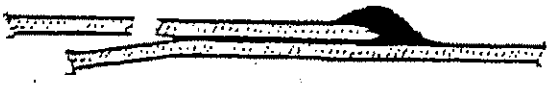
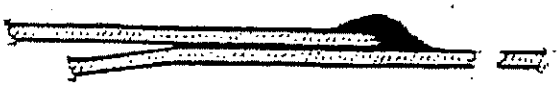
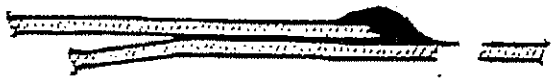
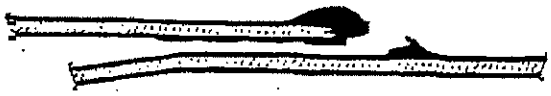
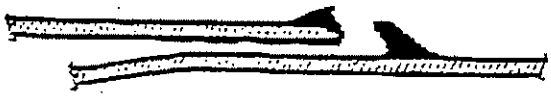
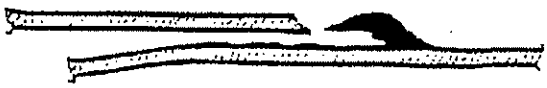
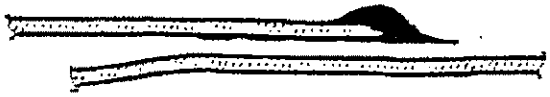
TEST STRIP	RESULTS
	(Pass) – FTS IN BOTTOM SHEETING
	(Pass) – FTS IN TOP SHEETING
	(Pass) – FTS IN BOTTOM SHEETING AT INNER EDGE OF SEAM
	(Pass) – FTS IN TOP SHEETING AT INNER EDGE OF SEAM
	(Pass) – FTS IN BOTTOM SHEETING SEAM AFTER SOME ADHESION
	(Pass) – FTS IN TOP SHEETING OF SEAM AFTER SOME ADHESION
	(Failure) – FAILURE IN ADHESION

* FTS = Film Tear Bond

Figure 2.5

VARIETIES OF SEAM FAILURE DURING DESTRUCTIVE TESTING OF EXTRUSION WELD



TEST STRIP	RESULTS
	(Pass) – FTS SEPARATION IN BOTTOM SHEET AFTER SOME DELAMINATION
	(Pass) – FTS SEPARATION IN TOP SHEET AT SEAM EDGE
	(Pass) – FTS SEPARATION IN TOP SHEET
	(Pass) – FTS SEPARATION IN BOTTOM SHEET
	(Pass) – FTS SEPARATION IN BOTTOM SHEET AT OUTSIDE SEAM EDGE
	(Pass) – FTS SEPARATION IN WELD (IF REQUIRED STRESS MEETS SPECIFICATIONS)
	(Pass) – FTS SEPARATION IN WELD (IF REQUIRED STRESS MEETS SPECIFICATIONS)
	(Failure) – SEPARATION IN ADHESION
	(Failure) – SEPARATION IN ADHESION

* FTS = Film Tear Bond

Figure 2.6

DAILY PROGRESS REPORT

Job Name: _____ Location: _____ Job #: _____ Date: _____

Agru/America, Inc. Representative: _____

HOURS:

No.	Trade	Hrs	Total Hrs
	Supervisor		
	Foreman		
	Technician		
	Labor		
	Operator		
	TOTAL HRS		

DAILY PRODUCTION

Material	Deployed	Welded	QCed

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

COMMENTS:

_____

DEPLOYMENT

Panel #	Roll #	Length

SEAMING

Seam	Machine	Length

QUALITY CONTROL

AT/VT	Seam	Length	Start	Stop	Tech.

Job Number:
Job Name:

Client:
Bill To:

Job Description:

% Complete	Total for Job

Certificate of Acceptance

Material	Estimated SF	Final Quantity/ Description

I, the undersigned, duly authorized representative of: _____
do hereby take over and accept the work described above from the date hereof and confirm that to the best of my knowledge the work has been completed in accordance with specifications and the terms and conditions of the contract.

Name:	Signature:	Title:	Date:

Certificate accepted by Agru America's Representative

Name:	Signature:	Title:	Date:

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

APPENDIX "A"

Agru America, Inc.
700 Rockmead, Suite 150
Kingwood, Texas 77339

SUBGRADE SURFACE ACCEPTANCE

Project Name: _____ Customer: _____

Project Number: _____ Date: _____

Location: _____ Partial: _____ Final: _____

This document only applies to the acceptability of surface conditions for installation of geosynthetic products. Agru America, Inc. does not accept responsibility for compaction, elevation or moisture content, nor for the surface condition maintenance during deployment. Structural integrity of the subgrade and maintenance of these conditions are the responsibility of the Owner or Earthwork Contractor.

For Agru America, Inc.:

_____

_____

For Contractor/Owner:

_____

_____

Acceptance Number: _____ Area Accepted: _____ SF

Total Area accepted to date: _____ SF

MANUFACTURING QUALITY CONTROL

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11/30/2007

AGRU AMERICA, INC. - QA/QC

Manufacturing – Quality Assurance/Quality Control

AGRU AMERICA, Inc. extrudes high density polyethylene (HDPE) and linear low density polyethylene (LLDPE) geomembrane, HDPE Geonet, and Geocomposite products at its plant located at 500 Garrison Road, Georgetown, South Carolina, 29440.

Our USA Manufacturing Quality Assurance Program is dependent on the utilization of an in-house laboratory which is, when necessary, complemented with testing performed by certified outside laboratories such as:

- Precision Geosynthetic Laboratories; Anaheim, CA
  Telephone (714) 520-9631; Fax (714) 520-9637
- TRI/Environmental, Inc.; Austin, Texas
  Telephone (512) 263-2101; Fax (512) 263-2558

  And other GRI-LAP accredited laboratories.

Raw Material – Manufacturer's Certificate of Conformity

HDPE and LLDPE resin is supplied to our plant in bulk and subjected to the following procedures:

- Prior to shipment, our resin supplier submits a certificate of analysis. Once approved, the resin is released for shipment to our plant.
- One sample is taken from each rail car after arrival and tested as follows:
  Melt Index ASTM D1238 190°C, 2.16kg, and Density ASTM D792.
- Once the tests have been completed and results found to be in compliance with our requirements, the resin is then unloaded into our silo system.
- At this stage, our supplier has performed one battery of tests and Agru America has performed one to verify the manufacturer's certificate of analysis.
- Off specification resin is returned to the supplier.
- The Manufacturer's MFI Test Data is reported on the Quality Certificate (Agru America's MFI Testing is done to verify this data).

GEOMEMBRANE

The Extrusion Process

The resin is conveyed through a vacuum pump system and flexible hoses to a dryer hopper, feeding the resin by gravity into an 8-inch barrel. This barrel is divided into five heating zones, each heating zone being computer controlled and constantly monitored.

A screw in the barrel turns at a prescribed and monitored speed. It conveys the resin slowly to full plastication, and then the plasticated resin is fed through a manifold into a coat hanger die having a width of approximately 24 feet. The die lips are open to a prescribed distance governed by the thickness of the geomembrane to be extruded.

Exiting the die, the plasticated resin forms a controlled and monitored bead, which feeds into a chrome three-roll stack in a prescribed pattern. Each chrome roll is set at a prescribed temperature, controlled by water circulation.

Exiting the controlled cooling of the roll stack, the geomembrane travels down the take off haulers towards the winder. On the way to the take off, the liner is trimmed to bring the finished width to the applicable standard. Trimmings are granulated.

The trimmed edge of one side of the geomembrane is marked at every 3.28 ft with thickness, Agru America name and year of manufacture. This marking also serves as product identification.

The geomembrane is visually inspected for surface defects as it travels down the take off by both the extruder and the winder operators.

The geomembrane is wound on a recycled HDPE core having 6" ID (150mm), 7" OD (175mm) and 22'8" (6.8m) length. Each smooth roll weighs approximately 3,000 pounds (1360 kg). Microspike® rolls weigh approximately 3,200 pounds (1450 kg). All rolls are fitted with two nylon slings when shipped.

Post Extrusion Quality Control

Once start-up conditions are over and commercial extrusion is initiated, post-production quality control comes into operation. A series of test procedures are performed based upon either our Standard Frequency of testing (attached), or frequencies required by customer specifications.

A sample approximately 11" by the full width of the geomembrane is taken from every roll. Based on the specified test frequencies, certain specimens are die cut, tested and the results summarized on the Quality Certificate issued by our Quality Control Department. The certificate is signed electronically by the Quality Control Manager. The Quality Control Manager reports directly to the President of the Company.

Rolls failing to comply with either Customer Project Specifications and/or our own latest revision to our published data sheets are set aside and re-classified as off-spec (Class B rolls).

Quality Certificates are provided for all rolls of geomembranes (sample smooth & Microspike® certificates are attached), with the exception of off-spec (Class B rolls).

Sometimes a third party Quality Assurance representative is mandated by the owner of a project to oversee our manufacturing QA. We gladly subscribe to this procedure and make all our records available 24 hours a day for the duration of the mandate.

The following roll identification items are reported in our Quality Certificate:

Roll number

(example) **203366 -06**

First digit	machine
Second and third digits	week of year
Fourth digit	day of week (Monday=1, Sunday=7)
Last two digits	roll number (first roll of week is 01, etc.)

The two last digits separated from the others indicate the year the roll was produced.

Using the above key:

Roll #203366 -06 was produced on Liner Machine #2 on Wednesday in the third week in 2006.

Product Description (liner type: Smooth, Microspike®, Drain®, Super Gripnet®, etc.)

Roll Length & Width in feet & meters

Raw material lot and/or batch number and supplier/product identification (from Resin Manufacturer's Certificate of Analysis – sample attached)

The following test results are reported in the Geomembrane Quality Certificate, derived from our Standard Test Frequency (attached) and/or supplied raw material manufacturer Certificates of Analysis:

Test / Method	Results Reported & Modifications to Standard (if any)
Thickness †ASTM D5199(Smooth), or †D5994(Textured) **(Both Modified)**	Minimum, Maximum, and Average Sheet Thickness in mm and mils. **Modification from Standard** = Measurements are taken upon sample reaching Lab Temperature Equilibrium.
Asperity Height †GRI GM12 **(Modified)** Textured liner only	Asperity height in mils **Modifications from Standard** = Edge samples are collected from the smooth/textured junction, **not** 1 foot from edge. ASTM D5994 specimens are used for this test, not direct placement.
Density †ASTM D792	Density in g/cc
Melt Flow Index †ASTM D1238	g/10minutes (Conditions =190°C, 2.16kg). **NOTE:** Resin Manufacturer's **Certificate of Analysis result** is reported. Our testing verifies this result.
Carbon Black Content †ASTM D4218	% Carbon Black by weight
Carbon Black Dispersion †ASTM D5596	Category (Only near spherical agglomerates per GRI GM 13 & 17)
Tensile Strength †ASTM D6693 Type IV, 2 inches / minute **(Modified)**	Average Strength @ Yield in psi, ppi, & N/mm Average Strength @ Break in psi, ppi, & N/mm Average Elongation @ Yield in % Average Elongation @ Break in % **Modification from Standard** = Average of MD & TD results are reported **NOTE 1:** The D6693 results equate to the following **D638 Modifications**: Gage Length for Yield = 1.3", for Break = 2" **NOTE 2:** Yield data not reported for LLDPE
Dimensional Stability †ASTM D1204 **(Modified)**	Average Dimensional Change in % **Modification from Standard** = Average Dimensional Change of MD & TD is reported. Test is run upon sample reaching Lab Temperature Equilibrium
Tear Resistance †ASTM D1004 **(Modified)**	Tear Resistance in Lbs & N. **Modifications from Standard** = Test is run upon sample reaching Lab Temperature Equilibrium. Average Tear Resistance of MD & TD is reported.
Puncture Resistance †ASTM D4833 †FTMS 101C Method 2065 **(Both Modified)**	Puncture Resistance in Lbs & N. **Modification from Standard** = Test is run upon sample reaching Lab Temperature Equilibrium.
Environmental Stress Crack Resistance (ESCR) †ASTM D1693 **(CERTIFIED)**	This test is n longer run by Agru America, and the result is now certified by Agru America for 1500 hours (Certification letter is attached, as well as GAI-LAP's approval of the certification.)
Notched Constant Tensile Load †ASTM D5397 (Single Point, Appx.)	Pass / Fail at 300 hours (or as required by customer specifications) This test run on HDPE only, and on smooth edge of textured liners.
Oxidative Induction Time (OIT) †ASTM D3895 Standard, 200°C, 1atm.	OIT Time in minutes. **Modification from Standard** = One run only – if result is below 120 minutes, a second run is done to verify the first.

†GRI-LAP Accredited for this method (INCLUDING Modifications)

The following Test methods are also performed per railcar in our Standard MQC, but results are **not** reported on our Quality Certificates (results can be forwarded if necessary).

Test / Method	Results Reported
Low Temperature Brittleness ASTM D746 **THIS TEST OUTSOURCED TO AN ACCREDITED 3rd PARTY LAB**	Pass / Fail for each specimen (5 specimens in both MD & TD), % of samples passing. **NOTE:** Standard MQC Temperature tested to is **-60°C**. Lower Temperatures can be done if required by customer specifications.

Additional Test Procedures
(Available if Specified from GRI-LAP Accredited Third Party Labs)

Hydrostatic Resistance	ASTM D751
Volatile Loss	ASTM D1203
Resistance to Soil Burial	ASTM D3083 using ASTM D638 Type IV dumbbell at 2"/min.
Water Absorption	ASTM D570
Coefficient of Thermal Expansion	ASTM D696
Friction Angle Direct Shear Method	ASTM D5321
Moisture Vapor Transmission Rate 100°F - 100% RH	ASTM E96
Transmissivity (Profiled) Various gradients & confining pressure	ASTM D4716
Multi-axial Tensile Strain at Rupture (percent)	ASTM D5617
Modulus of Elasticity (or 2% Secant Modulus)	ASTM D638 (Modulus) or ASTM D5323

Drainage Net (Geonet)

AGRU America drainage net is made from a blend of high quality virgin HDPE and a carbon black masterbatch. The purpose of the carbon black is to protect the plastic from UV damage in the field application.

All raw materials as well as the finished products are conistently monitored by specially trained lab technicians. Raw materials are tested as above for Geomembrane.

The blend of raw materials is plasticized by an extruder, which presses the melt through a screen changer to filter out impurities. The plastic is then fed into a rotating die which creates the net. The cooling of the net takes place in a water tank at a tightly controlled temperature. A series of nip rollers pull the net out of the tank and through the downstream equipment to the winders. The net is cut to length automatically and wound onto a 4" OD cardboard core.

Before the finished rolls are taken out of the winder frame, the quality control technician either releases the material into stock or classifies the material as scrap.

When approved by QC, the rolls are stretch wrapped and transferred to the storage yard.

Geocomposite

In addition to the drainage net, AGRU America offers geocomposites which consist of geotextiles laminated to one or both sides of the net.

All geotextiles used for this lamination process are being inspected to meet AGRU America's (or project) specifications.

The lamination process takes place just before the net reaches the winders at the end of the extrusion line. After melting the surface of the HDPE drainage net, a geotextile is pressed into the net by means of a calender. The outer 6 inches of net are not laminated and the geotextile overlaps the net by an additional 6 inches on both sides of the product.

Before the finished rolls are taken out of the winder frame, the quality control technician either releases the material into stock or classifies the material as scrap.
When approved by QC, the rolls are stretch wrapped and transferred to the storage yard.

All drainage net and geocomposite rolls are labeled as follows:

- one label on each face of the roll
- two hand written roll numbers on the stretch wrap packaging
- one label on the laboratory sample
- numbering system is as above for geomembrane

The following test results are reported in the Geonet/Composite Quality Certificate, derived from our Test Results and/or supplied raw material manufacturer Certificates of Analysis:

Test / Method	Results Reported & Modifications to Standard (if any)
Thickness (Geonet) †ASTM D5199	Minimum, Maximum, and Average Geonet Thickness in mm and mils. **Modification from Standard** = Measurements are taken upon sample reaching Lab Temperature Equilibrium. English Units reported
Density (Geonet) †ASTM D792	Geonet Density in g/cc
Melt Flow Index (Geonet) †ASTM D1238	g/10minutes (Conditions =190°C, 2.16kg). **NOTE:** Resin Manufacturer's **Certificate of Analysis result** is reported. Our testing verifies this result.
Carbon Black Content (Geonet) †ASTM D4218	% Carbon Black by weight
Peak Tensile Strength (Geonet) †ASTM D5035 or †ASTM D7179 **(Both Modified)**	MD Only tested, TD upon request only. Peak Strength @ Break in ppi **Modification from Standard** = English Units reported
Mass Per Unit Area (Geonet) †ASTM D5261	Average Mass per Unit Area in lb/ft^2 **Modification from Standard** = English Units reported
Transmissivity (Geonet) †ASTM D4716	Transmissivity, m^2 / sec Plate to Plate , 21°C, **gradient = 0.1, load = 10,000psf, seat time = 15 minutes** is Agru America's Standard Geonet MQC Transmissivity test (may be changed per project MQC specs)
Transmissivity (Geocomposite) †ASTM D4716	Transmissivity, m^2 / sec Plate to Plate , 21°C, **gradient = 0.1, load = 10,000psf, seat time = 15 minutes** is Agru America's Standard Geocomposite MQC Transmissivity test (may be changed per project MQC specs)
Ply Adhesion (Geocomposite) †ASTM D7005	Peel Strength, lbs/in, min. ave.

†GRI-LAP Accredited for this method (INCLUDING Modifications)

Geomembrane
Standard Frequency of Testing

Product Data

Property	Test Method	Frequency of testing (min.)*
Thickness (min. ave.), mil (mm)	ASTM D5994/D5199	per roll
Asperity Height (min. ave.), mil (mm)	GRI GM12 (for textured liner)	per roll, alternating top/bottom for dbl sided textured liner only
Density, g/cc, minimum average	ASTM D792, Method B	200,000 lbs (railcar)
Tensile Properties (ave. both directions)	ASTM D6693, Type IV	
Strength @ Yield (min. ave.), lb/in width (n/mm)	2 in/minute	
Elongation @ Yield (min. ave.), % (GL=1.3in)	5 specimens in each direction	20,000 lbs
Strength @ Break (min. ave.), lb/in width (n/mm)		
Elongation @ Break (min. ave.), % (GL=2.0in)		
Tear Resistance (min. ave.), lbs. (n)	ASTM D1004	45,000 lbs
Puncture Resistance (min. ave.), lbs. (n)	ASTM D4833	45,000 lbs
Carbon Black Content (range in %)	ASTM D4218	20,000 lbs
Carbon Black Dispersion (Category)	ASTM D5596	45,000 lbs
Stress Crack Resistance (Single Point NCTL), hours	ASTM D5397, Appendix	per GRI GM10
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O_2	200,000 lbs (railcar) on finished liner
Melt Flow Index, g/10 minutes	ASTM D1238, 190°C, 2.16kg	200,000 lbs (railcar) on incoming resin
Low Temperature Brittleness, °C	ASTM D746, -60°C	200,000 lbs (railcar) on finished liner
Oven Aging	ASTM D5721	per resin formulation
with HP OIT, (% retained after 90 days)	ASTM D5885, 150°C, 500psi O_2	
UV Resistance	GRI GM11	per resin formulation
with HP OIT, (% retained after 1600 hours)	ASTM D5885, 150°C, 500psi O_2	
2% Secant Modulus (max.), lb/in. (n/mm)	ASTM D5323	per resin formulation-**for LLDPE liner only**
Axi-Symmetric Break Resistance Strain, % (min.)	ASTM D5617	per resin formulation-**for LLDPE liner only**

These test frequencies meet or exceed GRI's GM13/GM17

***These test frequencies may be changed based on project specifications, and represent the minimum MQC testing performed. Additional costs may be incurred if required testing is greater than listed above, or if testing for properties not listed above is required.**

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

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

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CoA Date: 07/14/2004

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: GRANT PALMER
Fax:

CPC Delivery #: 86671544
PO #: 03814
Weight: 190000 LB
Ship Date: 07/14/2004
Package: BULK
Mode: Hopper Car
Car #: GOCX058461
Seal No: 301173

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8140404

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.260	g/10mi
HLMI Flow Rate	ASTM D1238	22.00	g/10mi
Density	ASTM D1505	0.9380	g/cm3
Pellet Count	P02.08.03	30.000	pel/g
Production Date		3/22/04	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Carol Meza at 713-475-3625

agru america
quality control dept.

quality certificate

ROLL # **211351-06** Lot #: **MM193612** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.81 mm	71 mil
Asperity GRI GM12: 30 mil	AVE:	1.58 mm	62 mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	1.5 mm		60 mil
Length.....	125 m		410.1 feet
Width.....	7.00 m		23.0 feet
OIT(Standard) ASTM D3895 minutes	143		

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.944
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g	g/10 min			.24
Carbon Black Content ASTM D4218	Range	%			2.35
Carbon Black Dispersion ASTM D5596	Category				1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm	152 ppi		2,448 psi
	Average Strength @ Break	31 N/mm	177 ppi		2,842 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.46
Lo = 2.0" Break	Average Elongation @ Break	%			502.2
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.61
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.1 N			55.095 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.3 N			98.324 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	614.2 N			138.08 lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING

Customer: **Environmental Specialties**
PO: **6208 Big Run Landfill**
Destination **Ashland, KY**

Date: 3-15-06

Signature: [signature]
Quality Control Department

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REV 03
12/23/05

agru america quality control dept

quality certificate

ROLL # **206769-06** Lot # **CSG812000** **Liner Type:SMOOTH LLDPE**

		METRIC	ENGLISH
Thickness Measurement ASTM D5199 (Modified)	MIN:	1.425 mm	56 mil
	MAX:	1.703 mm	67 mil
	AVE:	1.558 mm	61 mil

Thickness	1.5mm	60mil	
Length	128 m	420	feet
Width	6.86 m	22.5	feet
OIT(Standard) ASTM D3895	minutes	144	

Specific Gravity ASTM D792		Density	g/cc			.937
MFI ASTM D1238 COND. E GRADE:	7104	Melt Flow Index 190°C /2160 g	- g /10 min			.32
Carbon Black Content ASTM D4218		Range	%			2.46
Carbon Black Dispersion ASTM D5596		Category				1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Break	53 N/mm	300 ppi	5,005 psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Break	%			931.1
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			-0.20
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	204 N		45.966 lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	455 N		102.37 lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	550 N		123.56 lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		CERTIFIED	

Customer:
PO:
Destination

Date: 2-13-06

Signature: _____

Quality Control Department

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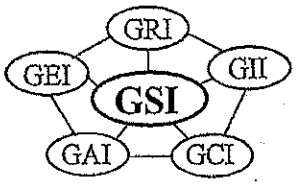
REV 02
12/23/05

Geosynthetic Institute
475 Kedron Avenue
Folsom, PA 19033-1208 USA
TEL (610) 522-8440
FAX (610) 522-8441



June 7, 2007

Mr. Grant Palmer
Laboratory Director
Agru-America Inc.
500 Garrison Road
Georgetown, SC 29440

Re: GAI-LAP Accreditation

Dear Grant:

The Geosynthetic Institute (GSI) is pleased to acknowledge Agru-America Inc. on its repertoire of Geosynthetic Accreditation Institute's-Laboratory Accreditation Program (GAI-LAP) accredited tests. This letter should serve as notification that Agru-America Inc. located in Georgetown, SC is currently accredited for the following twenty test methods until June 30, 2008.

1. ASTM D792 Test Method for Specific Gravity (Relative Density) and Density of Plastics by Displacement
2. ASTM D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
3. ASTM D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
4. ASTM D1238 Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
5. ASTM D1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics
6. ASTM D3895 Test Methods for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
7. ASTM D4218 Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
8. ASTM D4716 Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
9. ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

10. ASTM D5035 Test Method for Breaking Strength and Elongation of Textile Fabrics (Strip Method)
11. ASTM D5199 Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
12. ASTM D5261 Test Method for Measuring Mass per Unit Area of Geotextiles
13. ASTM D5397 Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes using Notched Constant Tension Load Test
14. ASTM D5596 Test Methods for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
15. ASTM D5994 Test Method for Measuring the Core Thickness of Textured Geomembranes
16. ASTM D6693 Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
17. ASTM D7005 Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
18. ASTM D7179 Test Method for Determining the Geonet Breaking Force
19. FTM STD. No. 101c (method 2065), Puncture Resistance and Elongation Test (1/8 in. radius probe)
20. GRI GM-12 Asperity Measurement of Textured Geomembranes Using a Depth Gage

A certificate to this affect has been enclosed, signed and sealed. Any questions regarding your accreditation should be directed to George or Robert Koerner at (610) 522-8440. Once again congratulation and thank you for participating in the GAI-LAP.

Best Regards,

George R. Koerner, Ph.D., P.E. & CQA
Director Designate GSI

Accreditation #:
GAI-LAP - 26 - 97
TEL (610) 522-8440

Geosynthetic Institute
475 Kedron, Ave.
Folsom, PA 19033

Agru America, Inc.

is granted accreditation
for designated geosynthetic test methods in accordance with the
Geosynthetic Accreditation Institute - Laboratory Accreditation Program
(GAI-LAP), as published in its annual directory.
This accreditation is valid until June 30, 2008.

Robert M. Koerner, Ph.D., P.E.
Director

George R. Koerner, Ph.D., P.E. & COA
Auditor

GRI GEI GII GSI GAI GCI

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agru america
Technology in Plastics

North Wake Landfill
Raleigh, NC

This is to confirm that all extrudate is manufactured by one Manufacturer, Agru America, Inc. and that the resin is supplied from the same supplier. Both have the same physical properties. Agru certifies that the sheets, extrudate, and pipe boots are compatible with one another. Additives shall be thoroughly dispersed and materials shall be free of contamination by moisture or foreign matter.

Paul Barker /VP

Paul W. Barker
Technical Director

Date: May 29, 2008

agru america
Technology in Plastics

North Wake Landfill
Raleigh, NC

Handling, lifting, rigging and storing shall be performed carefully to minimize the possibility of damage. The lifting of the materials shall be by slings, rub strips on equipment shall be used when off loading and laying materials if recommended by the manufacturer. This shall include the wearing of proper soft sole shoes as appropriate for each liner type. Pushing, sliding, or dragging the roll shall not occur. Adequate storage space will be available to protect the materials from theft, vandalism, and vehicular damage. The rolls shall be stored on a prepared surface free of rocks, sticks, roots or other matter that may damage the material. No wooden pallets shall be used and not more than two rolls high will be stacked. Liner shall be stored in a dry area and protected from precipitation and direct sunlight.

Paul Barker PWB

Paul W. Barker
Technical Director

Date: May 29, 2008

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

agru america

Technology in Plastics

North Wake Landfill
Raleigh, NC

Agru America, Inc. will confirm that the 40 mil LLDPE Smooth ® supplied will be from a virgin, new, first quality resin without carbon black or other additives and shall be designed and manufactured specifically for the purpose of liquid containment in hydraulic structures and chemically resistant to leachate. Reclaimed polymer shall not be added to the resin.

Paul Barker/kd

Paul W. Barker
Technical Director

Date: May 29, 2008

North Wake Landfill
Raleigh, NC

Agru America will certify that the properties of the resin meet the minimum requirements in Part 2.02, A. 3 of the specifications for this submittal. The geomembrane shall be manufactured from only the approved resin type.

Paul W. Barker
Technical Director

Date: May 29, 2008

agru america
Technology in Plastics

North Wake Landfill
Raleigh, NC

Agru America will certify that Agru's 40 mil LLDPE Microspike ® material shall meet the minimum properties as listed in GRI GM 17.

Paul W. Barker
Technical Director

Date: May 29, 2008

agru america
Technology in Plastics

North Wake Landfill
Raleigh, NC

Agru America confirms that each roll shall identify the manufacturer's lot number, roll number, thickness, length and width.

Paul Barker/PW

Paul W. Barker
Technical Director

Date: May 29, 2008

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

agru america
Technology in Plastics

North Wake Landfill
Raleigh, NC

This is to confirm that the materials that are produced by Agru America will be free of pinholes, blisters, bubbles, undispersed resins or any other sign of contamination by foreign matter. The material will be uniform in color, thickness and surface texture and shall contain no additives or filler.

Paul Barker /pwb

Paul W. Barker
Technical Director

Date: May 29, 2008

SAMPLE ONLY

LIMITED MATERIAL WARRANTY

PROJECT NAME: North Wake Landfill
TYPE MATERIAL: 40 mil LLDPE Smooth®
LOCATION: Raleigh, NC
COMPANY REQUESTED: Hallaton, Inc.

The company, referred to herein as AGRU AMERICA, warrants that AGRU AMERICA liners will correspond to the specifications as indicated in AGRU AMERICA technical records, catalogs, guidelines and test certificates at the time when sold.

AGRU AMERICA warrants that the material is faultless and resistant for a period of 2 years, prorated from the point of time sold, when properly installed, covered, and used for: Landfill

AGRU AMERICA's liability under this warranty is not applicable when damage is caused by:

Natural phenomena such as thunderstorms, floods, earthquakes, acts of war or other acts of God;
Chemicals which are not suitable for LLDPE materials according to chemical resistance guides or from experience.

Further, AGRU AMERICA is not liable for damages due to the misapplication, incorrect installation, and damages resulting from any kind of inadequate handling. In the event that any defects are noticed in the liner, AGRU AMERICA must be notified in writing within thirty (30) days.

AGRU AMERICA shall be given an opportunity to ascertain the cause of damages. AGRU AMERICA reserves the right to decide how damages will be settled.

Under no circumstances will AGRU AMERICA assume liability for consequential damages due to defective liner or incorrect installation. AGRU AMERICA will not be responsible for failures arising from incorrect welding of seams in the installation.

Further, AGRU AMERICA's warranty will be void in the event that the buyer performs repairs or makes alterations without the express approval of AGRU AMERICA in writing. AGRU AMERICA's maximum liability under this warranty will not exceed the purchase price of liner and will only be in force when payment has been made in full and further claims regardless of the legal suppositions are not applicable.

This warranty is only valid on condition that the generally approved technical standards and in particular the guidelines for the installation of the liner are followed.

For AGRU AMERICA, Inc.

_____ _____

Authorized Official (Date)

Paul W. Barker (Date: Date of Installation)
Vice President

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

agru america
quality control dept
Technology in Plastics

Resin Supplier Plant Locations

Chevron (LLDPE) 7104 geomembrane resin, (HDPE) HHM 5502BN net resin

Chevron Phillips Chemical Co. LP
Cedar Bayou Chemical Complex
9500 I-10 East Exit 796
Baytown, TX
77521-9570
USA

Chevron (HDPE) K307, (LLDPE) K203 geomembrane resin, (HDPE) HHM 5502BN net resin

Chevron Phillips Chemical Co. LP
Pasadena Plastics Complex
1400 Jefferson Rd
Pasadena, TX
77506
USA

Chevron (HDPE) 9512 net resin

Chevron Phillips Chemical Co. LP
Orange Chemical Plant
5309 Farm Market Rd 1006
Orange, TX
77630
USA

Petromont HDPE-7002 geomembrane resin

Petromont, Inc.
10455 Metropolitain Est
Montreal, Quebec
H1B 1A1
Canada

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

For more information and technical assistance contact:

Chevron Phillips Chemical Company LP
P.O. Box 4910
The Woodlands, TX 77387-4910
1.281.231.1212

MARLEX® POLYETHYLENE

PREMIUM EXTRUSION AND RIGID PACKAGING RESINS

Marlex® K307

MEDIUM DENSITY POLYETHYLENE

This medium density, high molecular weight hexene copolymer is tailored for geomembrane applications that require:

- Outstanding ESCR
- Broad fusion range
- Excellent melt strength
- Good processability

Typical geomembrane applications for K307 include:

- Landfill liners
- Gasoline and chemical tank containment liners
- Tunnel moisture barriers
- Mine tailing collection projects

This resin meets these specifications:

- ASTM D4976 - PE 225
- GRI-GM13 except carbon black requirements
- FDA 21 CFR 177.1520(c) 3.1a, use conditions C through G per 21 CFR 176.170(c). Volume of food contacting article must be equal to or greater than 5 gallons.

NOMINAL PHYSICAL PROPERTIES[1]	English	SI	Method
Density	---	0.937 g/cm^3	ASTM D1505
Flow Rate (HLMI, 190/21.6)	---	21.0 g/10 min	ASTM D1238
Tensile Strength at Yield, 2 in/min, Type IV bar	2,900 psi	20 MPa	ASTM D638
Elongation at Break, 2 in/min, Type IV bar	800%	800%	ASTM D638
Flexural Modulus, Tangent - 16:1 span:depth, 0.5 in/min	120,000 psi	830 MPa	ASTM D790
ESCR, Condition B (10% Igepal), F_{50}	>1,500 h	>1,500 h	ASTM D1693
ESCR, Condition C (100% Igepal), F_{50}	>1,500 h	>1,500 h	ASTM D1693
SP-NCTL	>900 h	>900 h	ASTM D5397 (Appendix)
Durometer Hardness, Type D (Shore D)	57	57	ASTM D2240
Vicat Softening Temperature, Loading 1, Rate A	221°F	105°C	ASTM D1525
Heat Deflection Temperature, 66 psi, Method A	137°F	58°C	ASTM D648
Brittleness Temperature, Type A, Type I specimen	<-103°F	<-75°C	ASTM D746
Tensile Impact, Type S bar	190 ft•lb/in^2	400 kJ/m^2	ASTM D1822

1. The nominal properties reported herein are typical of the product, but do not reflect normal testing variance and therefore should not be used for specification purposes. Values are rounded. The physical properties were determined on compression molded specimens that were prepared in accordance with Procedure C of ASTM D4703, Annex A1.

Another quality product from Chevron Phillips Chemical Company LP The Woodlands, Texas

Before using this product, the user is advised and cautioned to make its own determination and assessment of the safety and suitability of the product for the specific use in question and is further advised against relying on the information contained herein as it may relate to any specific use or application. It is the ultimate responsibility of the user to ensure that the product is suited and the information is applicable to the user's specific application. Chevron Phillips Chemical Company LP does not make, and expressly disclaims, all warranties, including warranties of merchantability or fitness for a particular purpose, regardless of whether oral or written, express or implied, or allegedly arising from any usage of any trade or from any course of dealing in connection with the use of the information contained herein or the product itself. The user expressly assumes all risk and liability, whether based in contract, tort or otherwise, in connection with the use of the information contained herein or the product itself. Further, information contained herein is given without reference to any intellectual property issues, as well as federal, state or local laws which may be encountered in the use thereof. Such questions should be investigated by the user.

PETROMONT™

POLYETHYLENE SUMMARY DATA

PETROMONT HDPE 7002

MEDIUM DENSITY POLYETHYLENE RESIN

MELT INDEX 0.20 dg/min.
DENSITY 0.9375 g/cm^3

GEOMEMBRANE CAST LINE GRADE

DESCRIPTION

Petromont HDPE 7002 is a medium-density polyethylene hexene modified resin with an excellent balance of chemical resistance and durability. It is designed to be readily processed by flat die extrusion equipment.

Petromont HDPE 7002 is an unpigmented polyethylene compound which, after proper incorporation of carbon black, may be used for geomembrane applications, such as liners for landfills and surface impoundments, where polyethylene is the material of choice. Comprehensive information on such facilities is available in documents issued by the U.S.A EPA.

When **Petromont HDPE 7002**, containing sufficient stabilizers, is properly processed into sheet, installed and seamed, the resulting liner is expected to provide excellent resistance to aqueous chemicals and solvents as well as to stress cracking. Sheet made in this way from **Petromont HDPE 7002** can be expected to pass the physical property requirements of the GM-13 of GRI (*Geosynthetic Research Institute*) for Flexible Membrane Liners.

The manufactured sheet should be tested to determine suitability for use in applications where unique conditions may apply, as is the case with leachate from each specific waste site.

PHYSICAL PROPERTIES

PROPERTIES	UNITS S.I.	UNITS ENG	TEST METHOD	TYPICAL VALUES S.I.	TYPICAL VALUES ENG
Melt Index, I_2	dg/min		ASTM D 1238/E	0.20	0.20
Flow Index, I_{21}	dg/min		ASTM D 1238/F	20	20
Density	g/cm^3		ASTM D 1505	0.9375	0.9375
Test results on moulded plaque					
Tensile Strength at yield	MPa	psi	ASTM D 638	20	2,850
Tensile Strength at break	MPa	psi	ASTM D 638	31	4,500
Elongation at Break	%		ASTM D 638	>850	>850
Flexural Modulus	MPa	psi	ASTM D 790	650	95,000
ESCR, (F_0)	hours		ASTM D 1693/B	>2,000	>2,000
Oxygen Induction Time [1]	min.		ASTM D 3895	>100	>100

(1) At 200°C with oxygen in aluminium pan.

PETROMONT

Responsible Care®
Beyond what's required.

STORAGE AND HANDLING

Petromont HDPE 7002 is supplied in pellet form. The product may readily be conveyed and bulk-fed through equipment designed for conventional pelleted polyethylene resin provided the equipment is designed to prevent accumulation of the fines and dust particles that are contained in all polyethylene resins. These fines and dust particles can, under certain conditions, pose an explosion hazard. We recommend that the conveying system used be: (1) equipped with filters of adequate size, (2) operated and maintained in such a manner to insure no leaks develop and (3) grounded adequately at all times. We further recommend good housekeeping be practised throughout your facility.

The fines and dust particles contained in all polyethylene resins are defined as Class I Dust (lowest explosive level) under National Fire Protection Association (NFPA)-68. Your facilities and procedures must conform to NFPA-654. These fines and dust particles are considered a nuisance dust under OSHA-1910.1000 and personnel exposure must be controlled accordingly. Before using this product, read and understand the current Pétromont Material Safety Data Sheet for this product.

AVAILABILITY

Petromont HDPE 7002 is available in both bulk hopper cars and bulk hopper trucks. Contact the Pétromont sales office nearest you for availability in your area.

EMERGENCY SERVICE

Pétromont maintains an around-the-clock emergency service for its polyethylene products. In the event of spills, leaks, fires or other emergencies involving Pétromont products, call collect day or night:

1-514-640-6400 (Montreal)

Please specify that it is an emergency and your call will be directed to the Emergency Coordinator on duty.

DO NOT WAIT. Phone if in doubt. You will be referred to a specialist for advice.

SALES OFFICES

MONTREAL
Pétromont Inc.
10455 Metropolitain blvd.
Montreal East, Quebec
H1B 1A1

Telephone: (514) 640-6400
Telefax: (514) 645-8149

TORONTO
Pétromont Inc.
252 Valencia Road
Mississauga, Ontario
L5N 4L6

Telephone: (905) 821-2336
1-800-263-9261
Telefax: (905) 821-0115

CUSTOMER SATISFACTION

Pétromont Inc.
10455 Metropolitain blvd.
Montreal East, Quebec
H1B 1A1

Telephone: (514) 640-6400
1-800-663-3712
Telefax: (514) 645-8149

u:\fichetec\HDPE7002.tec
10/05 Rev.2

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Responsible Care® and logo are registered trademarks of the Canadian Chemical Producers' Association.

agru america

Technology in Plastics

HDPE/LLDPE MICROSPIKE ®

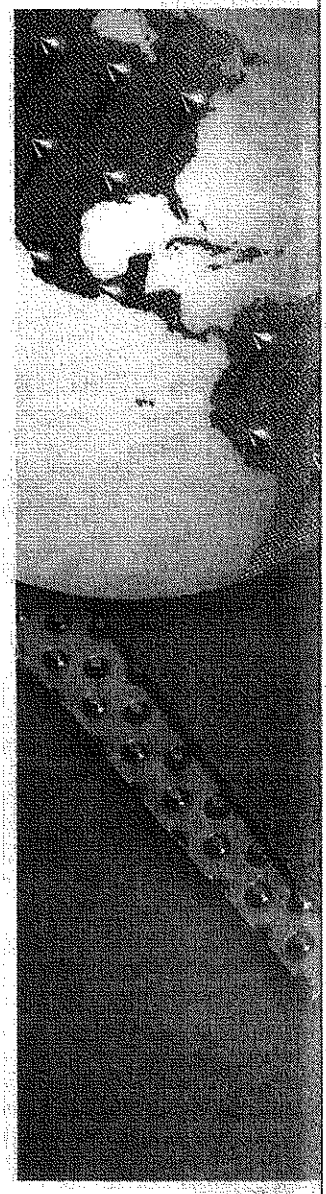
- OVER 400% ELONGATION AT BREAK
- HIGH TEAR & PUNCTURE
- HIGH FRICTION ANGLES
- NO CO-EXTRUSION OR "SPRAY-ON"
- UNIFORM SURFACE

Executive Offices: 500 Garrison Road, Georgetown, SC 29440 • 843 546-0600 • 800 321-1379 • Fax 843 546-0516
Sales Office: 600 Rockmead, Suite 103, Kingwood, TX 77339 • 281 358-4741 • 800 373-2478 • Fax 281 358-5297
Email: salesmkg@agruamerica.com

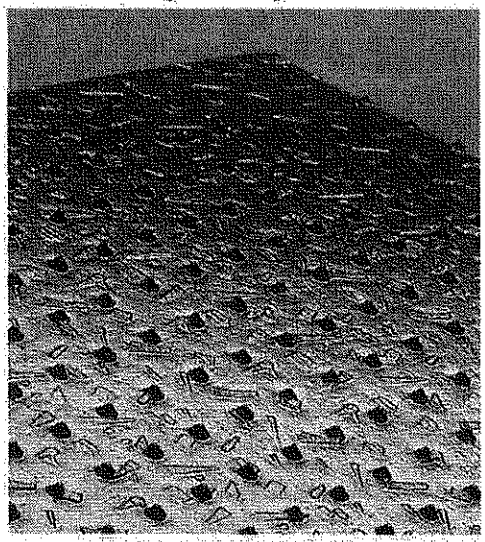
Micro Spike® Textured Geomembrane

Applications for HDPE and LLDPE Micro Spike®, textured geomembranes include projects where slope stability is critical. Micro Spike® is the only HDPE or LLDPE geomembrane that exhibits reproducible texture and friction angle values with the highest interface surface friction values in the industry. Micro Spike® is a patented product.

Agru America's structured Geomembranes are produced on state-of-the-art equipment using a flat die-cast extrusion manufacturing process as opposed to blown film extrusion. Agru America is the only manufacturer of structured and embossed Geomembranes in North America.



Micro Spike® surface texture



US Patent - No. 6,203,741 and 6,132,845

Comparative properties for Design Consideration

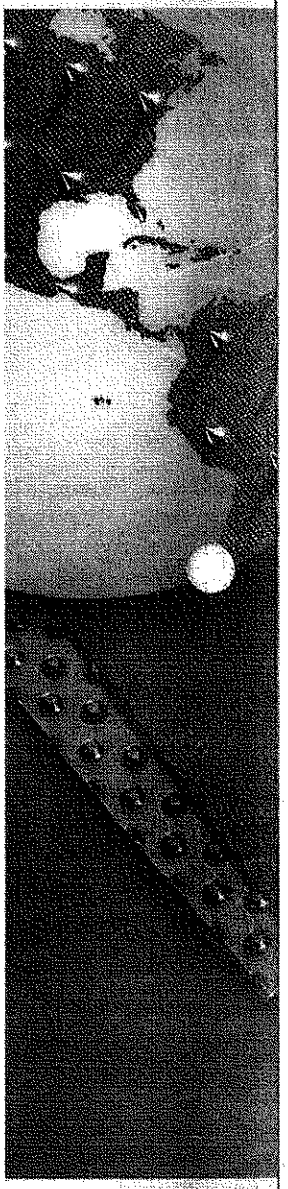
Blown film co-extruded textured surfaces vs. Micro Spike® structured textured surfaces

Design Consideration	Blown film co-extruded	Micro Spike® structured
Consistent core thickness	no	yes
Consistent surface texture	no	yes
Consistent asperity height	no	yes
Consistent interface friction	no	yes
Affect on mechanical properties	yes	no
Affect on stress crack potential	yes	no
Affect on multiaxial stress-strain	yes	no
Reduction in CQA program costs (less testing required)	no	yes

The calendared structured liner manufacturing process allows production of the only textured liner with a consistent core thickness, resulting in unchanged mechanical properties from that of smooth sheet. The consistent surface structuring or texture gives Micro Spike® Geomembranes reproducible friction angle values with efficiencies of over 95%.

Representative Large Scale Interface Shear Values – *ASTM 5321*
landfill cap loading conditions

Soil/Micro Spike® Surface	P	LD
Coarse Sand	34°	34°
Glacial Till	37°	42°
Silty Sand	32°	28°
Non Woven GT	32°	17°



Micro Spike® geomembranes are manufactured to meet or exceed current industry standards including GRI GM 13 (HDPE) and GRI GM 17 (LLDPE) test values, frequency of testing and functional requirements. Micro Spike® textured Geomembranes have smooth edges to allow for high quality thermal fusion welding between adjacent sheets. All Agru Geomembrane material is rolled on solid plastic pipe cores to ensure ease of installation without damage to the rolled material.

Micro Spike® textured HDPE and LLDPE geomembrane has a decided advantage over blown film textured geomembrane:

Reliability: Micro Spike's® reproducible friction angles gives the design engineer the confidence that he has designed a system that will be built to meet or exceed the project design requirements.

Cost Savings: Micro Spike® is competitively priced with value added advantages including consistent core thickness and texture which reduces installation costs, on-site quality control and third party quality assurance costs.

Consistent Material: The structured "Micro Spikes" are totally integrated with the Geomembrane.

Highest Tensile Values: Agru's LLDPE Micro Spike® has a 400% Elongation at Break (HD 350%), in an industry where the standard is only 250%* (HD 100%*). Our calendared Structured Manufacturing Process produces a consistent core thickness, resulting in the highest tensile values available in the industry.
*Tensile elongation values from GRI GM 13 & 17

High Interface shear: Exceptional shear resistance between soil and geotextile components allows flexibility and stability during protective cover material placement. The textured asperity height is not only consistent but higher than competitive textured products.

Why specify or use anything else!

Agru Worldwide has over 20 years experience with Geomembranes and 50 years experience with Thermoplastic Extrusion. Agru offers a wide range of concrete protective liners (Sure Grip), pipe, fittings, sheet stock, billet and solid rod.

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

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Linear Low Density Polyethylene Micro Spike® Liner

Product Data

Property	Test Method	Values			
Thickness (min. ave.), mil	ASTM D5994*	38	57	76	95
Thickness (lowest indiv. for 8 of 10 spec.), mil	ASTM D5994*	36	54	72	90
Thickness (lowest indiv. for 1 of 10 spec.), mil	ASTM D5994*	34	51	68	85
Asperity Height (min. Ave.), mil	GRI GM-12	16	16	16	16
Density, g/cc, minimum	ASTM D792, Method B	0.92	0.92	0.92	0.92
Tensile Properties (ave. both directions)	ASTM D6693, Type IV				
Strength @ Break (min. ave.), lb/in width	2 in/minute	112	168	224	280
Elongation @ Break (min. ave.), % (GL=2.0in)	5 specimens in each direction	400	400	400	400
Tear Resistance, lbs. (min. ave.)	ASTM D1004	25	36	50	60
Puncture Resistance, lbs. (min. ave.)	ASTM D4833	80	100	130	160
Carbon Black Content (range in %)	ASTM D4218	2 - 3	2 - 3	2 - 3	2 - 3
Carbon Black Dispersion (Category)	ASTM D5596	Only near spherical agglomerates for 10 views: 9 views in Cat. 1 or 2, and 1 view in Cat. 3			
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O_2	≥100	≥100	≥100	≥100
Melt Flow Index, g/10 minutes	ASTM D1238, 190°C, 2.16kg	≤1.0	≤1.0	≤1.0	≤1.0
Oven Aging	ASTM D5721				
with HP OIT, (% retained after 90 days)	ASTM D5885, 150°C, 500psi O_2	60	60	60	60
UV Resistance	GRI GM11	20hr. Cycle @ 75°C/4 hr. dark condensation @ 60°C			
with HP OIT, (% retained after 1600 hours)	ASTM D5885, 150°C, 500psi O_2	35	35	35	35
2% Secant Modulus, lb/in. (max.)	ASTM D5323	2400	3600	4800	6000
Axi-Symmetric Break Resistance Strain, % (min.)	ASTM D5617	30	30	30	30

These product specifications meet or exceed GRI's GM-13

***The thickness values may be changed due to project specifications (i.e., absolute minimum thickness)**

Supply Information (Standard Roll Dimensions)

Thickness		Width		Length		Area		Weight	
mil	mm	ft	m	ft	m	ft^2	m^2	lbs	kg
40	1.0	23	7	492	150	11,316	1,051	3,020	1,373
60	1.5	23	7	410	125	9,430	876	3,356	1,522
80	2.0	23	7	328	100	7,544	700	3,306	1,500
100	2.5	23	7	246	75	5,658	525	3,167	1,436

Notes:

All rolls are supplied with two slings. All rolls are wound on a 6 inch core. Special roll lengths are available on request. Standard rolls have a diameter of approximately 29 inches (750mm). A 40 foot standard container will hold 12 standard rolls. A 48 foot flatbed trailer will hold 12 standard rolls.

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

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

5/04

APPENDIX B-2

LLDPE Liner Installer Qualifications and Experience

Technology in Plastics

Hallaton, Inc.

Hallaton, Inc. is a well established lining installation company within the Geosynthetic Industry. Hallaton is one of the largest installers of Agru America, Inc.'s products in the Mid Atlantic region and one of our top installers in the United States.

Agru America, Inc. has worked successfully with Hallaton over the years on multiple projects where Hallaton has installed over 10,000,000 square feet of HDPE and LLDPE Smooth/Microspike material. Hallaton is familiar with approved installation procedures and we have recognized them as one of our top-tier "Priority Installers".

Agru America, Inc. does not warrant or guarantee the work of any Approved Installer. Approved installers are independent contractors that provide specific installation services and do not act as agents or representatives of Agru America, Inc.

Paul W. Barker
Technical Director
Agru America, Inc.

Date: July 18, 2007

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

HALLATON, INC.

1206 Sparks Road • Sparks, MD 21152
410.583.7700 • Fax: 410.583.7720

Company Bio

Incorporated: 1993

Key Personnel: President – Todd Harman - Tharman@Hallaton.com
Vice President - Scott Brinkerhoff - Sbrinkerhoff@Hallaton.com
Business Development Director - Michael Dorsch - Mdorsch@Hallaton.com
Senior Estimator – Rick Wood - Rwood@Hallaton.com
Project Manager- Kennedy Garber - Kgarber@Hallaton.com
Office Manager- Beverly deBloom - Bdebloom@Hallaton.com

Number of Employees: 45, Over 150 years combined experience on staff

Number of Crews: 4-5, time of year dependent

Quantity of Geosynthetics Installed: Over 140 million square feet
2007 - 27,261,235 square feet
2006 - 31,867,214 square feet
2005 - 27,918,415 square feet
2004 - 15,364,773 square feet
2003 - 21,911,650 square feet

Sales: 2007 sales in excess of twelve million dollars

Geosynthetics Installed: HDPE, LLDPE, PVC, PP, XR3, XR5, GCL, EPDM, Geocomposite, Geotextile, Geogrid, Geocells, HDPE pipe, Spray-on liquid membranes, other miscellaneous materials.

Suppliers: Poly-Flex (#3 Dealer in US), CECTO (Preferred Installer), Agru America, Solmax, GSE, Tenax, Skaps, Bentofix, Watersaver, PLR, Raven Industries, & many more.

Certifications: Member IAGI, Master Seamers are IAGI certified fusion and extrusion welders, 40 hour hazmat for Supervisors, QA/QC, and Master Seamers, First Aid/ CPR.

Safety: Comprehensive In-house safety program including: Company HASP, daily site safety meetings, quarterly company safety meetings, field personnel PPE: long pants, sleeved shirts, steel toe boots, safety vest, leather gloves and safety glasses.

Training: Yearly training by Demtech Services: operation and maintenance of welding equipment. Yearly training by Union Special: operation and maintenance of sewing machines. Yearly Hazmat refresher.

HALLATON, INC.

1206 Sparks Road • Sparks, MD 21152
410 583 7700 • Fax: 410 583 7720

May 28, 2008

North Wake Subtitle D Landfill
Phase 2 Closure
Wake County, North Carolina

As requested in section 02776 paragraph 1.03.A.2.b.2 in the specifications for the above referenced job, Hallaton Inc. anticipates an average production rate of approximately 85,000 square feet of installed Geosynthetics per day.

If there are any questions or concerns please feel free to contact me. Thank you.

Kennedy Garber, Assistant Project Manager

HALLATON, INC.

1206 Sparks Road • Sparks, MD 21152
410 583 7700 • Fax: 410 583 7720

May 28, 2008

North Wake Subtitle D Landfill
Phase 2 Closure
Wake County, North Carolina

Item 1.03.A.2.b.3

Hallaton will meet or exceed the seam strength requirements as listed in GRI GM 19 for peel and shear values. Attached you will find a copy of the GRI GM19 specification for your use.

If there are any questions or concerns please feel free to contact me. Thank you.

Kennedy Garber- Assistant Project Manager

HALLATON, INC..
LIMITED WORKMANSHIP WARRANTY

Warranty No: _____

Project No: _____

Effective Date: _____

PURCHASER NAME:_____

ADDRESS:_____

CITY, STATE, ZIP:_____

SAMPLE

PROJECT NAME:_____

DESCRIPTION:_____

ADDRESS:_____

CITY, STATE, ZIP_____

SAMPLE

HALLATON, INC. warrants each LINER SYSTEM installed by HALLATON, INC. to be free from defects in workmanship. This "Workmanship Warranty" shall be in effect from the date the installation of the Liner System is completed and accepted by the Owner for a period of two years of normal use in approved applications.

This Limited Warranty does not include damages or defects in The Liner System resulting from acts of God, casualty or catastrophe including but not limited to: earthquakes, floods, piercing hail, tornadoes or force majeure. The term "normal use" as used herein does not include, among other things, the exposure of The Liner System to harmful chemicals, abuse of The Liner System by machinery, equipment or people, excessive pressures or stress from any source, subsurface or overburdened soil conditions, and total or differential soil settlements and the effect these may have on the liner system.

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

Any claim for any alleged breach of this warranty must be made in writing, by certified mail, to the President of Hallaton, Inc. within thirty (30) days after the alleged defect is noticed. Should the required notice not be given, the defect and all warranties shall be deemed to have been waived by the Purchaser, and Purchaser shall have no right of recovery against Hallaton, Inc. In the event repairs and/or replacements are to be effected, said repairs and/or replacements shall not become due until the area subject to repair and/or replacement of Liner is available to Hallaton, Inc. in a clean, dry, unencumbered condition. This includes, but is not limited to, the area made available for repair and/or replacement of Liner to be free from all water, dirt, sludge, residuals, and liquids of any kind.

Hallaton, Inc.'s liability under this warranty shall in no event exceed the replacement cost of the material and installation sold to the Purchaser for the particular installation in which it failed. Further, under no circumstances shall Hallaton, Inc. be liable for any special, direct, indirect, or consequential damages arising from loss of production or any other losses including losses due to personal injuries and product liability owing to the failure of the material or installation and no allowance will be made for repairs, replacements, or alterations made by the Purchaser without the express written consent of Hallaton, Inc.

Hallaton, Inc. neither assumes nor authorizes any person other than an officer of Hallaton, Inc. to assume for it any other or additional liability in connection with the Liner System made the basis of the Limited Warranty. The Limited Workmanship Warranty on the Liner herein is given in lieu of all other possible material warranties, either express or implied, and by accepting delivery of the material, Purchaser waives all other possible workmanship warranties, except those specifically given.

The parties expressly agree that the sale hereunder is for commercial or industrial use only.

Hallaton, Inc. Limited Warranty is extended to the purchaser/owner and is non transferable and non-assignable.

Purchaser acknowledges by acceptance that the Limited Workmanship Warranty given herein is accepted in preference to any and all other possible workmanship warranties.

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

WARRANTY BECOMES EFFECTIVE UPON RECEIPT OF FINAL PAYMENT

I hereby state I have read and understood the above and foregoing Limited Warranty and agree to such by signing hereunder.

PURCHASER NAME:_____

SIGNATURE:_____

TITLE:_____

DATE:_____

HALLATON, INC.

_____

President

Sworn before me this_____day of_____,19____.

_____

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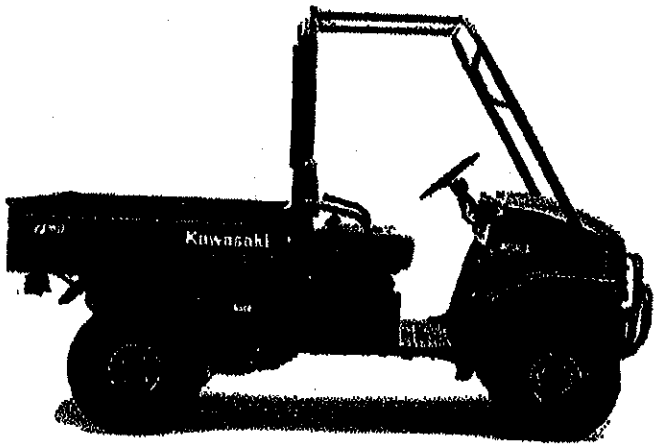
Proposed Use of Kawasaki Mule 4x4

Panel Deployment

In deploying Geosynthetic panels, Hallaton Inc. intends to use a low ground pressure Kawasaki Mule 4x4 to pull panels into place. The use of this piece of equipment will be undamaging to the subgrade and Geosynthetics. If damage to the subgrade or Geosynthetics occur, use of the Mule will cease immediately. This piece of equipment will allow for increased job progress and a better finished product.



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Geomembrane Installation and QC Procedures

Materials Logistics

Transportation and On-site Storage

The geomembrane rolls shall be shipped by trailer truck to job site. A full truckload consists of 12 rolls. The geomembrane shall be stored so as to be protected from puncture, dirt, grease, moisture and excessive heat. The damaged material shall be stored separately for repair or replacement. The rolls shall be stored on a prepared smooth surface (not wooden pallets) and should not be stacked more than three rolls high.

Earthwork

General

The owner or his representative (soil quality assurance inspector) shall inspect the subgrade preparation. Prior to liner installation the subgrade shall be compacted in accordance with the project specifications. Weak or compressible areas which cannot be satisfactorily compacted should be removed and replaced with properly compacted fill. All surfaces to be lined shall be smooth, free of all foreign and organic material, sharp objects, or debris of any kind. The subgrade shall provide a firm, unyielding foundation with no sharp changes or abrupt breaks in grade. Standing water or excessive moisture shall not be allowed.

The installer, on a daily basis, shall approve the surface on which the geomembrane will be installed. After the supporting soil surface has been approved, it shall be the installer's responsibility to indicate to the inspector any changes to its condition that may require repair work.

Vegetation Control

The general contractor, if necessary, shall sterilize the area using an effective soil sterilant specifically formulated for vegetation present in the area. The sterilant shall not be harmful to the liner and shall be applied according to the recommendations of its manufacturer.

Anchor Trench

The anchor trench shall be excavated to the line, grade, and width shown on the project construction drawings, prior to liner system placement. Slightly rounded corners shall be provided in the trench to avoid sharp bends in the geomembrane.

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Method of Placement

The rolls should be deployed using a spreader bar assembly attached to a loader bucket or by other methods approved by the project engineer.

The installer shall be responsible for the following:

1. Equipment or tools shall not damage the geomembrane during handling, transportation and deployment.
2. Personnel working on the geomembrane shall not smoke or wear damaging shoes.
3. The methods used to unroll the panels shall not cause scratches or crimps in the geomembrane and shall not damage the supporting soil.
4. Adequate loading (e.g., sand bags or similar items that will not damage the geomembrane) shall be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under panels).

Weather Conditions

Geomembrane deployment shall proceed between ambient temperatures of 32° F to 104° F. Placement can proceed below 32° only after it has been verified by the inspector that the material can be seamed according to the specification. Geomembrane placement shall not be done during any precipitation, in the presence of excessive moisture (e.g., fog, rain, dew) or in the presence of excessive winds, as determined by the installation supervisor.

Field Seaming

Approved seaming processes are fusion and extrusion welding. On side slopes, seams shall be oriented in the general direction of maximum slope, i.e., oriented down, not across the slope. In corners and odd-shaped geometric locations, the number of field seams shall be minimized.

No base T-seam shall be closer than 5 feet from the toe of the slope. Seams shall be aligned with the least possible number of wrinkles and "fishmouths." If a fishmouth or wrinkle is found, it shall be relieved and cap-stripped.

Seam Overlap

Geomembrane panels must have a finished minimum overlap of 4 inches for fusion welding and 6 inches for extrusion welding.

Cleaning solvents may not be used unless the product is approved by the liner manufacturer.

Seaming Equipment and Accessories

Approved equipment for field seaming are fusion welders and extrusion fillet welders.

1. Fusion Welder, 110 Volt (220 Volt).
2. Extrusion Welder, 220 Volt.
3. High-speed, 10,000 rpm, 4 or 4 ½ inch side grinder with 50-80-grit discs.
4. 6.5 KW Generator, single-phase with 110/220 Volt Outputs.
5. Power Cord, minimum S.O. type, 12 gauge O.S.H.A. approved electrical cord with O.S.H.A. approved twist-type plugs and connections.
6. Vacuum Box Test Equipment for non-destructive seam testing.
7. Air pressure test equipment for non-destructive seam testing.
8. Field Tensiometer, capable of performing quantitative shear and peel tests.

Test Seams

Field test seams shall be conducted on the liner to verify that seaming conditions are satisfactory. Test seams shall be conducted at the beginning of each seaming period and at least once each 5 hours, for each seaming apparatus and personnel used that day. The responsible QC manager will review all trial weld samples and results prior to field production seaming

All test seams shall be made in contact with the subgrade. Welding rod used for extrusion welding shall have the same properties as the resin used to manufacture the geomembrane. The test seam samples shall be 3 feet long for fusion welding and 3 feet long for extrusion welding with the seam centered length-wise. Five specimens shall be cut from each end of the test seams by the inspector. The technician shall use a tensiometer to test 3 specimens for shear and 3 specimens for peel. Each specimen shall be one inch wide with a grip separation of 4 inches plus the width of the seam. The seam shall be centered between the clamps. The rate of grip separation shall be 2 inches per minute. Test results for seam strength properties shall pass seam acceptance criteria. Shear and peel tests shall result in Film Tearing Bond (FTB), which is a failure in ductile mode of one of the bonded sheets by tearing prior to complete separation in the bonded area. If a test seam fails to meet field seam specifications, the seaming apparatus and/or seamer shall not be used for seaming until the deficiencies are corrected and a successful test seam achieved.

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Non-Destructive Seam Testing

The Installer shall non-destructively test all field seams over their full length utilizing the following methods.

Vacuum Box Testing

Equipment for testing extrusion seams shall be comprised of the following:

1. A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft rubber gasket attached to the bottom, port hole or valve assembly, and a vacuum gauge.
2. Soapy solution in a plastic bucket with a mop.

The following procedures shall be followed by the installer:

1. Excess sheet overlap shall be trimmed away.
2. Wet a strip of geomembrane approximately 12 inches by the length of the box with the soapy solution.
3. Place the box over the wetted area and compress.
4. Create a vacuum of 3 – 5 psi.
5. Ensure that a leak tight seal is created.
6. For a period of approximately 15 seconds, examine the geomembrane through the viewing window for the presence of animated soap bubbles.
7. If no animated soap bubbles appear after 10 seconds, shut off the vacuum box and move the box over the next adjoining area with a minimum 3 inches overlap and repeat the process.
8. All areas where animated soap bubbles appear shall be marked, repaired and then retested.

The following procedures shall apply to locations where seams cannot be non-destructively tested.

1. If the seam is accessible to testing equipment prior to final installation, the seam shall be non-destructively tested prior to final installation.
2. If the seam cannot be tested prior to final installation, the seaming operations shall be observed and inspected by the QC manager or the Engineer's field representative.

Air Pressure Testing (For Double Fusion Seams Only)

Equipment for testing double fusion seams shall be comprised of the following:

1. An air pump equipped with pressure gauge capable of generating and sustaining a pressure between 25 and 30 psi.

2. A pressure gauge equipped with a sharp hollow needle.

The following procedures shall be followed by the installer:

1. Seal on end of the seam to be tested.
2. Insert needle or other approved pressure feed device through the sealed end of the channel created by the double wedge fusion weld.
3. Energize the air pump to verify the unobstructed passage of air through the channel.
4. Seal the other end of the channel.
5. Energize the air pump to a pressure between 25 and 30 psi, close valve, allow 2 minutes for the injected air to come to equilibrium in the channel, and sustain pressure for at least 5 minutes.
6. If loss of pressure exceeds 3 psi, or pressure does not stabilize, locate any faulty area, repair and retest.
7. If pressure does not drop below the acceptable value after five minutes, cut the air channel open at the opposite end from the pressure gauge. The air channel should deflate immediately indicating that the entire length of the seam has been tested.
8. All test locations which have passed air pressure testing shall be marked with the test date, values, and tester initials.

Destructive Seam Testing (if required by project specifications)

Destructive seam testing should be minimized to preserve the integrity of the liner. The installer shall provide the inspector with destructive test samples per project specifications from locations specified by the inspector. Liner panels shall not be covered with any cover material until all destructive samples within that area have been confirmed to have pass the Quality Assurance Laboratory testing.

Sampling Procedure

In order to obtain test results prior to completion of liner installation, samples shall be cut and marked by the installer as the seaming progresses. The installer shall also record the date, location, and pass or fail description. All holes in the geomembrane resulting from obtaining the seam samples shall be immediately patched and vacuum tested.

Size and Disposition of Samples

The samples shall be 12 inches wide by 40 inches long with the seam centered lengthwise. The sample shall be cut into three equal-length pieces (each 12" x 12"), one to be given to the Quality Assurance Laboratory for testing, one to be given to the owner/engineer and one to the installer QC Manager.

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Field Testing

The QC manager shall test one 1-inch wide specimen from each end of the 40-inch sample prior to cutting into three equal pieces, each will be tested for peel strength. Both specimens must pass the project seam requirements before the QAL sample is released for testing.

Independent Laboratory Testing by Quality Assurance Laboratory

The test method and procedures to be used by the independent laboratory shall be as defined in the project specification or as follows.

1. The laboratory shall cut the sample into ten (10) coupons, each one inch wide. Five (5) shall be tested for peel and five (5) shall be tested for shear values. Per GRI GM-19 Four of the five coupons shall meet the minimum project specification values and the fifth specimen shall be within 80% of the project specification values for the seam sample to pass.

Procedures for Destructive Test Failure

The following procedures shall apply whenever a sample fails the field destructive test:

1. The installer will retrace the welding path to an intermediate location (usually 10 feet on both sides of the location of the failed test sample), and take a sample for an additional destructive sample test. If this test passes, then the seam shall be cap stripped between the locations of the two passed destructive samples. If the test fails, then the process is repeated until a passing sample is found along the seam in question on both sides of the original failed sample.
2. Over the length of seam failure, the installer shall either cut out the old seam, reposition the panel and re-seam, or add a cap strip.
3. All destructive sample tests shall be documented as to the pass/fail result, the location of the sample, and all action taken for failure correction.

Defects and Repairs

All seams and non-seam areas of the geomembrane shall be inspected for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection.

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Evaluation

Each suspect location in seam and non-seam areas shall be non-destructively tested as appropriate in the presence of the inspector. Each location that fails the non-destructive testing shall be marked by the inspector, and repaired accordingly.

Repair Procedures

1. Defective seams shall be cap stripped or replaced. Small seam lengths (approximately 3 feet) may be extrusion welded provided there is sufficient overlap between the liner panels.
2. Small holes shall be repaired by extrusion welding. If the hole is larger than ¼ inch, it shall be patched.
3. Tears shall be repaired by patching. Where the tear is on a slope or an area susceptible to stress and has a sharp end, it must be rounded prior to patching.
4. Blisters, large cuts and undispersed raw materials shall be repaired by patches.
5. Patches shall be done by extrusion welding. The weld area shall be ground no more than one hour prior to welding. No more than 5% of the thickness shall be removed by grinding. Welding shall commence where the grinding started and must overlap the previous seam by at least 2 inches. Re-seaming over an existing seam without regrinding shall not be permitted. The welding shall restart by grinding the existing seam and re-welding a new seam.

Patches shall be round or oval in shape, made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects.

Verification of Repairs

Each repair shall be non-destructively tested. Repairs that pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be repeated and retested until passing test results are achieved.

The Quality Control manager shall keep daily documentation of all non-destructive and destructive testing. This documentation shall identify all seams that initially failed the test and include evidence that these seams were repaired and successfully retested. Each repair shall be recorded by number, date and test outcome.

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Backfilling of Anchor Trench

The anchor trench shall be backfilled by the earthwork contractor. Trench backfill material shall be placed and compacted in accordance with the project specifications.

Care should be taken when backfilling the trenches to prevent any damage to the geomembrane. If damage occurs, it shall be repaired prior to backfilling.

Geomembrane Acceptance

The installer shall retain all ownership and responsibility for the geomembrane until acceptance by the owner.

Final acceptance is when all the following conditions are met:

1. Installation is finished.
2. Verification of the adequacy of all field seams and repairs, including associated testing, is complete.

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Hallaton Inc. Crew List

Field Operations Manager-
Justin Harward

Supervisors-
Arturo Sanchez
Homero Telles
Maurico Sanchez
Alex Lopez

Master Seamers-
Edilzar Anzueto
Carlos Sanchez
Francisco Fernandez
Hermino Vasquez
Ignacio Fernandez
Luis Ordonez
Marcial Ramos
Ramiro Olvera
Roberto Ordonez
Trinidad Montes

Typical Site Trailer Equipment

Equipment Type	Quantity	Description
6000 LB Forklift	2	SkyTrac 6036 or equal, Tool handler
Wedge Welder	4	Dem-Tech Prowedge
Extrusion Welder	3	ProX-2
Generator	5	Honda 6500, Generac 4000 (typical)
Tensiometer	1	Dem-Tech Protester or equal
Handheld Hot air welder	4	Leister
Grinder	4	Various 4, 4.5" disc
Vacuum Box	2	Columbine Vacu-lite
Air pressure test equipment	8	Various Gauges, needles, hardware
Liner Deployment Bar	1	"Z-bar" liner deployment apparatus
Low ground pressure 4x4	1	Kawasaki Mule 4x4 ATV
Sewing Machines	3	Union Special 2200B, Newlong NPII

Hallaton, Inc.
Geomembrane Experience Resume - 2005

Material	Quantity	Project	Location	Date	Owner	GC	Engineer
45 mil PP	43,000	Idlewilde Dredged Material Placement Site Rehab.	Shadyside, MD	Mar-05	Anne Arundel County Ron Etzel 410-222-7575	Ferguson Trenching Chris Rock 410-519-5700	Bayland Consultants 410-694-9401
40 mil LLDPE, TX Geocomposite	253,650 253,650	Harrisburg LF Cap	Harrisburg, PA	Apr-05	City of Harrisburg	Pavex, Inc. Brent Gallagher 717-761-1502	Brinjac Engineering Robert Schopfer 717-233-4502
30 mil PVC	6,672	I70/I81 Dry Swale	Hagerstown, MD	Apr-05	MD SHA	Concrete General Mark Miller 301-948-4450	Wallace, Montgomery
60 mil LLDPE, TX 16 oz Geotextile	1,632,000 3,264,975	Newark Water Reservoir	Newark, DE	Apr-05	City of Newark	George & Lynch Michael Hall 302-328-6275	URS Corp. Jill Voeller 302-791-0700
40 mil HDPE, SM	4,550	Westmoreland Site Vapor Barrier	Arlington, VA	Apr-05	Silverwood Homes	Falls Church Constr. Doug Finlayson 703-591-0600	
45 mil PP	107,000	Bivalve Dredged Material Placement Site	Bivalve, MD	Apr-05	Wicomico County	Ray Nomes, Inc. 410-641-0647	Andrews, Miller & Assoc. 410-228-7117
60 mil HDPE, TX 60 mil HDPE, SM Geocomposite 16 oz Geotextile	129,069 79,106 7,125 6,000	Rocky River WTP	Anderson, SC	May-05	City of Anderson	South Atlantic Constr. Tom Underhill 864-229-7531	Design South Profnls. Frank Morgan 864-226-6111
60 mil HDPE, TX 60 mil HDPE, SM Geocomposite 16 oz. Geotextile	147,436 90,364 20,340 6,150	Generostee WTP	Anderson, SC	May-05	City of Anderson	South Atlantic Constr. Tom Underhill 864-229-7531	Design South Profnls. Frank Morgan 864-226-6111
60 mil HDPE, TX	41,227	Lucky Stone Site	Fredericksburg, VA	May-05	N/A	JL Kent & Sons, Inc. Bobby Kent 540-898-3359	N/A
60 mil HDPE, TX Geocomposite GCL 28 oz. Geotextile	993,600 74,200 993,600 993,600	Buncombe County LF Cell 6	Alexander, NC	May-05	Buncombe County Jerry Mears 828-645-5311	Thalle Construction Chris Haverstrom 919-245-1490	CDM Chris Gable 703-642-5500
60 mil HDPE, TX Geocomposite GCL 16 oz. Geotextile	360,677 200,000 100,000 360,377	Modern LF Cell 15B	York, PA	May-05	Republic Services Mark Pedersen 717-246-2686	Owner	Earth Tech 717-244-2536
40 mil HDPE, TX Geocomposite 10 oz. Geotextile	435,165 443,025 435,165	Modern LF Cap	York, PA	May-05	Republic Services Mark Pedersen 717-246-2686	Owner	Earth Tech 717-244-2536
60 mil HDPE	3,400	Advanced Auto SWMP	Martinsburg, WV	Jun-05	Primax Construction	DL George Dean Beaver 717-765-4700	N/A

Hallaton, Inc.
Geomembrane Experience Resume - 2005

Material	Quantity	Project	Location	Date	Owner	GC	Engineer
40 mil HDPE, SM 12 oz Geotextile	17,600 17,600	Lake Ashburton Washwater Lake Rehab.	Baltimore, MD	Jun-05	City of Baltimore	Allied Contractors Gary Simpson 410-852-2650	Whitman,Requardt Assoc. 410-235-3450
XR-5 Geocomposite	18,562 16,200	Kent County WWTP	Milford, DE	Jun-05	Kent County DPW Reinhold Betschel 302-335-6000	Owner	Owner
40 mil HDPE, TX Geocomposite	36,600 440,000	Sandy Hill LF	Bowie, MD	Jun-05		Ryan Central inc, Joe VanRamortal 608-754-2291	GeoSyntec Consultants 410-381-4333
GCL	200,100	Sun Meadows Ponds	Walkersville, MD	Jul-05		Musselman Excavating Jeff Musselman 301-898-7364	Lavelle & Associates 301-695-9727
40 mil HDPE Geocomposite	50,500 50,500	Dominion Extraction Plant	Pine Grove, WV	Aug-05	Dominion Extraction	Ryan Environmental Mike Westfall 304-889-3178	N/A
60 mil LLDPE, TX 10 oz. Geotextile	303,424 480,908	Orleans Homes	Downingtown, PA	Sep-05	N/A	Intergeo Archie Filshil 215-947-8562	N/A
40 mil LLDPE, TX Geocomposite 10 oz. Geotextile	519,500 534,000 537,000	Snow Hill Landfill Cap	Snow Hill, MD	Sep-05	Worcester County, MD	Weston Solutions Pat Doran 610-701-3000	EA Engineering Geoff Little 410-771-4958
80 mil HDPE, TX 60 mil HDPE, SM Geocomposite Geonet GCL 8 oz. Geotextile Raincover	765,000 270,000 765,000 270,000 10,000 150,000 400,000	Millersville LF Cell 8	Severn, MD	Sep-05	Anne Arundel Co. DPW Greg Stewart 410-222-7028	Pavex, Inc. Brent Gallagher 717-761-1502	Gannett Fleming Steve Krajcsik 717-763-7211
50 mil PVC Geocomposite GCL 10 oz. Geotextile 16 oz. Geotextile Raincover	810,000 45,000 807,030 776,718 858,636 841,500	Eastern LF Phase 9	White Marsh, MD	Sep-05	Baltimore Co DPW Steve Lippy 410-887-3531	Cherry Hill Construction Paul Brady 410-799-2382	Earth Tech Paul Witty
60 mil HDPE, TX 10 oz. Geotextile Raincover	220,000 220,000 164,700	Corral Farm LF Cell 11 Construction	Warrenton, VA	Sep-05	Fauquier Co. DES Bobby Smith 540-347-8811	New Dominion Constr. Michael Pascuzzi 724-356-4481	Joyce Engineering Lawrence Bertolet 804-355-4520
60 mil HDPE, TX	77,750	Ocean Pines WWTP	Berlin, MD	Oct-05	Worcester County, MD DPW	Bearing Construction Jim Merrell 410-556-6100	George, Miles & Buhr
GCL	104,945	TBH Concrete Plant SWMP	Martinsburg, WV	Oct-05	Thomas, Bennett, Hunter Kevin Beaver 410-848-9030	Owner	N/A

Hallaton, Inc.

Geomembrane Experience Resume - 2005

Material	Quantity	Project	Location	Date	Owner	GC	Engineer
40 mil LLDPE, TX	405,000	I-95 Landfill Partial Cap	Lorton, VA	Oct-05	County of Fairfax	Glover Construction	Draper Aden 804-264-2228
Geocomposite	1,055,700				Ramon Beltran 703-690-6694	252-536-2660	Jeremy Bosdell
60 mil HDPE	800	JM Huber Electric	Havre de Grace, MD	Nov-05	JM Huber	Schemm Electric	N/A
		Substation Dike				Bob Schemm 410-557-8550	
60 mil HDPE, TX	133,500	New Hanover Co. LF	Wilmington, NC	Nov-05	New Hanover County	ES & J Enterprises	SCS Engineers
60 mil HDPE, SM	423,000	Cell 6			Ray Church 910-341-4340	David Page 910-567-6138	Ed Hilton 813-621-0080
Geocomposite	537,750						
GCL	269,930						
40 mil LLDPE, TX	168,563	New Hanover Co. LF	Wilmington, NC	Nov-05	New Hanover County	ES & J Enterprises	SCS Engineers
Geocomposite	170,563	Partial Closure 3B-5			Ray Church 910-341-4340	David Page 910-567-6138	Ed Hilton 813-621-0080
8 oz. Geotextile	168,563						
60 mil HDPE, TX	270,000	Beulah LF Cell 4	Hurlock, MD	Nov-05	Dorchester County	Days Cove Reclamation	GeoSyntec
Geocomposite	270,000				Robt. Tenanty 410-228-2920	Bob Oler 410-289-1654	Brad Anderson 410-808-7388
GCL	270,000						
60 mil HDPE, TX	56,700	CMV Sewer	Felton, PA	Dec-05	CMV Sewer	Owner	N/A
16 oz. Geotextile	56,700				Bob Lyter 717-993-6300		
40 mil LLDPE, TX	445,625	Pittsylvania LF	Dry Fork, VA	Dec-05	Pittsylvania County	Thalle Construction	Dewberry & Davis
Geocomposite	442,400	Phase I Closure				Chris Haverstrom 919-245-1490	Shawn Harden 434-797-4497
GCL	450,225						
8 oz. Geotextile	9,000						

Hallaton, Inc.
Geomembrane Experience Resume - 2006

Material	Quantity (sf)	Project	Location	Date	Owner	GC	Engineer
60 mil LLDPE	140,000	Chester County Prison	West Chester, PA	Mar-06	Chester County Government	HT Sweeney & Sons, Inc.	URS
12 oz Geotextile	267,000	WWTP Lagoon				Chuck Walther 610-872-8896	
36 mil Hypalon	640	Talbot County WWTP	St. Michaels, MD	Mar-06	Talbot County Government	Bearing Construction	
						Jim Bearing 410-556-6100	
40 mil HDPE	290,000	Modern Landfill Cap	York, PA	Apr-06	Republic Services	Owner	Earth Tech
250 mil DS Geocomposite	290,000				Mark Pederson 717-246-2686		717-244-2536
10 oz Geotextile	290,000						
60 mil HDPE TX	85,000	Brown Station Landfill Cell 2	Upper Marlboro, MD	May-06	Prince Georges County Gov't	Cherry Hill Construction	EA Engineering
60 mil HDPE SM	482,000				Russ Yonkers 301-952-7634	Durant Walters 410-799-3577	Geoff Little 410-771-4950
16 oz. Geotextile	442,800						
Geocomposite	76,000						
60 mil HDPE	103,500	Days Cove Landfill Cell C	White Marsh, MD	Jun-06	Days Cove Reclamation Co.	Owner	URS Corp.
GCL	102,500				Bob Oler 410-269-1654		Jill Voeller 302-791-0700
Geocomposite	52,500						
60 mil HDPE TX	10,700	Ritchie Rubble Landfill Cell 2C	Upper Marlboro, MD	Jun-06	Ritchie Land Reclamation Co.	Owner	EA Engineering
60 mil HDPE SM	57,500				Jim Stewart 301-428-0800		Geoff Little 410-771-4950
GCL	68,700						
Geocomposite	68,700						
60 mil HDPE SM	652,050	Hanes Mill Landfill Cell 2	Winston-Salem, NC	Jul-06	City of Winston-Salem	Rifenburg Construction	HDR Engineering, Inc.
60 mil HDPE TX	47,150				David Saunders 336-747-7303	Glenn Weiss 919-598-6921	Dean Ferry 704-338-6700
GCL	697,500						
12 oz Geotextile	648,000						
8 oz Geotextile	631,350						
Composite	47,600						
20 mil HDPE SM	680,000						
40 mil LLDPE SM	877,500	Hanes Mill Landfill Cap	Winston-Salem, NC	Jul-06	City of Winston-Salem	Rifenburg Construction	HDR Engineering, Inc.
40 mil LLDPE TX	966,000				David Saunders 336-747-7303	Glenn Weiss 919-598-6921	Dean Ferry 704-338-6700
Composite	1,828,400						
GCL	875,250						
Welding Rod	1,012	lbs					
XR5	16,000	BWI Third Glycol Tank	BWI Airport, MD	Aug-06	Maryland Aviation Assc.	Keystruct Construction, Inc.	URS Corp.
			Fuel Farm		BWI Airport	Mike Dorgan 717-764-1326	Bernadette Lipari 410-785-7220

Hallaton, Inc.
Geomembrane Experience Resume - 2006

Material	Quantity	Project	Location	Date	Owner	GC	Engineer
60 mil HDPE SM Composite Geotextile	1,086,750 1,086,400 40,000	Central Landfill, Cell 4	Newark, MD	Aug-06	Worchester County Dept. of Public Works John Tustin 410-632-3766	Weston Solutions Pat Doran 610-701-3138	GW Griffith & Associates, LLC Gerv Griffin 410-632-1800
40 mil HDPE TX Geocomposite Geotextile	448,500 901,600 51,000	GE Landfill, Cap	Rome, GA	Aug-06	General Electric Cody Platt 706-291-3120	Compass Environmental Thad Penvel 770-879-4107	ACC Scott Callaway
30 mil HDPE SM 10 oz Geotextile	81,000 81,000	York County Rec Complex	Stewartstown, PA	Aug-06	York Co. Solid Waste & Refuse Authority - David Vollero	Pavex, Inc. Edgar Rodrigez - 717-761-1502	ARM Engineering Jim Warnick
60 mil HDPE SM 60 mil HDPE TX GCL Composite Geonet 8 oz Geotextile	532,170 306,590 837,825 266,000 560,000 569,250	Marshall Station Landfill, Cell	Terell, NC	Aug-06	Duke Power Aaron Kitzmiller 828-478-7774	Phillips & Jordan, Inc. Bruce Sekaly 336-478-0265	Chas H Sells, Inc Dan Brewer 704-662-0100
60 mil HDPE TX 80 oz Geotextile	23,000 10,000	Kinder Morgan	Carteret, NJ	Sep-06	Kinder Morgan Joe Van der Veken 732-541-5161, ext.5620	Hallaton, Inc.	N/A
40 mil LLDPE TX Tri-planar composite Bi-planar composite	2,806,000 1,542,340 1,245,000	Hernwood Landfill, Cap	Woodstock, MD	Oct-06	Baltimore County Government Steve Lippy 410-887-2009	Pavex Brent Gallagher 717-761-1502	EA Engineering Darl Kolar 410-771-4950
Woven Geotextile 10 oz Geotextile GCL 60 mil LLDPE	188,058 360,000 549,000 557,550	WR Grace Landfill, Cap	Baltimore, MD	Oct-06	WR Grace & Co.	Entact Kurt Gimbel 484-444-0702	GeoTrans, Inc. Gerald DeMers, PE
60 mil HDPE TX 16 oz non-woven geotextile 12 oz non-woven geotextile Composite	235,750 153,000 130,500 94,500	Shenandoah Landfill, Cell	Edinburg, VA	Oct-06	Shenandoah County Government Vincent Poling 540-459-6165	Ryan, Inc. Central David Overley 608-754-2291	SCS Engineering Roger Moeller 703-471-6150
40 mil LLDPE TX Geocomposite	151,800 151,800	New Hanover County Landfill Cell 3B-5 Closure	Wilmington, NC	Oct-06	New Hanover Government Dan Weaver 910-798-7184	ES & J Enterprises Sherwood Lucas 910-567-6138	SCS Engineering Ed Hilton 813-621-0080
40 mil LLDPE TX Geocomposite	484,000 345,000	RB Baker Landfill, Closure	Queenstown, MD	Nov-06	RB Baker & Sons, Inc. Ted Baker 410-827-8831	David A. Bramble, Inc. Mike Brauer 410-778-3023	Century Engineering, Inc. Mike Armstrong 443-583-2400
40 mil HDPE SM Geotextile	37,138 72,000	Tank Lining , 2ndary Containment	Salunga, PA	Nov-06	Kline Services Shawn Perry 717-587-1927	Owner	

Hallaton, Inc.
Geomembrane Experience Resume - 2006

Material	Quantity	Project	Location	Date	Owner	GC	Engineer
60 mil HDPE TX 60 mil HDPE SM GCL Composite	506,000 1,437,500 24,750 1,290,800	Northern Landfill, Cell SW-3	Westminster, MD	Dec-06	County Commissioners of Carroll County of MD J.Michael Evans 410-386-2043	Kibler Construction, Inc. Gary Tine 410-833-5345	Gannett Fleming, Inc. Jeffrey Stamm 410-585-1460
GCL 60 mil HDPE SM 16 oz Geotextile	404,550 396,000 396,000	Fairmont Rd. Landfill, Cell	Westover, MD	Dec-06	Somerset County Government Charles Cavanaugh 410-651-9641	Days Cove Reclamation Bob Oler 410-269-1654	MES Charles Peng 410-729-8300
40 mil LLDPE TX 8 oz Geotextile	13,800 18,000	LCSWA Bioretention Pond	Lancaster, PA	Dec-06	LCSWA Lancaster, PA	Wohlsen Construction Raleigh Osborne 717-299-2525	Gannett Fleming, Inc. Jeffrey Stamm 410-585-1460
40 mil HDPE SM 8 oz Geotextile	14,625 9,000	Mixing Pit Liner, Kline Facility	Salunga, PA	Dec-06	Kliner Services Shawn Perry	Buckwalter & Assoc. John Buckwalter 717-821-1874	

Hallaton, Inc.
Geomembrane Experience Resume - 2007

Material	Quantity (sf)	Project	Location	Date	Owner	GC	Engineer
Bentomat ST 40 mil LLDPE Tex DS Composite Claymax 200R	805,500 1,072,260 2,136,400 270,000	Tuscarora LF	New Bern, NC	Jan-07	Coastal Regional Solid Waste Management 7400 Coastal Hgwy 70 W. New Bern NC 252-633-6515	Thalle Construction, Inc. 228 S Churton St. Hillsborough NC. Chris Haverstrom 919-245-1490	Joyce Engineering, Inc. 2301 W. Meadowview Rd. Greensborough NC Evan Andrews 336-323-0092
12BV Geosynthetic Rain Cover 60 mil HDPE SM	554,103 2,500	Northern Landfill - Cell 3 Rain cover	Westminster, MD	Feb-07	Carrol County Government	Kibler Construction, Inc. 8211 Washington Blvd. Finksburg, MD 21048 Gary Tine 410-833-5345	Garret Flemming Jeff Stamm
60 mil HDPE SM 60 mil HDPE TX Bentomat ST Claymax 200R DS Composite 10 oz Geotextile 8 oz Geotextile	23,000 120,750 13,500 94,500 100,000 90,000 13,500	Ritchie Rubble Landfill Phase I - Cell 2C-1C	Upper Marlboro, MD	Mar-07	Pleasants Construction, Inc. 24024 Frederick Rd. Clarksburg, MD 20871 Mike Ensor 301-428-0800	Ritchie Land Reclamation Partnership 24012 Frederick Rd., Suite 200 Clarksburg, MD 20871 Jim Stewart 301-428-0800	EA Engineering 15 Loveton Cir. Sparks, MD 21152 Geoff Tizard 410-771-4950
30 mil XR -5	31,450	Laurel WWTP Lagoon	Laurel, DE	Mar-07	Town of Laurel Pam Gordy 302-841-4005	Bearing Constructionm Inc. 805 Shine Smith Rd. Sudlersville Jim Merrill 410-556-6100	George, Miles, & Burh 205 W. Main St. Salisbury, MD. Jim Hoageson 410-742-3115
45 mil PPL	2,520	Smithsonian Butterfly House	Washington, DC	Mar-07	Smithsonian Institute Dave Pascquell 202-368-6429	Faccina Construction 508 508 McCormick Dr.,Glen Burnie, MD. Mike Trapani 410-760-3892	Hayes,Seay,Mattern & Mattern, Inc., 1155 21st St. NW 202-721-7700
20 mil PVC	2,300	St. Michaels Bio Pond	St. Michaels, MD	Mar-07	Talbot Co. Public Schools	Mike Davidson Excav 4961 Cumberland Hgwy. Chambersburg PA. 717-264-2166	
60 mil HDPE TX	242,450	Courtland Farms LF	Leesburg, VA	Apr-07	Courtland Farms Loudoun LLC 1750 Tysons Blvd. 4th Flr. McClean VA. Bradley Kline 703-314-2769	Williams H. Hazel 4305 Hazel Park Ct. Chantilly, VA Nic Herr 703-378-8300	Bury & Partners Engineering 1643 Merrimac Trail Williamsburg, VA. Jessica Kwiatkowski 757-229-1776
60 mil HDPE TX Geosynthetic clay liner DS Composite	198,500 198,500 198,500	Honeygo Run Landfill - Cell 4	White Marsh, MD	May-07	Republic Services Honeygo LF 10710 Philadelphia Rd Perry Hall, MD 21128	Republic Services Honeygo LF 10710 Philadelphia Rd Perry Hall, MD 21128	Earth Tech 4 Neshaminy Interplex Suite 300 Trevose, PA 19053
Bentomant ST Geocomposite 40 mil LL TX Rain Cover	525,000 525,000 525,000 483,000	Johnston Co. LF	Smithfield, NC.	May-07	Johnston Co. Government 309 E. Market St. Smithfield, NC. Rick Hester 919-989-5075	Shamrock Environmental 503 Patton Ave. Greensboro, NC. Henry Havener 336-375-1989	Richardson,Smith, Garner & Asso 14 N. Boylan Ave Raleigh, NC Peter Scheer 919-828-0577
40 mil HDPE TX 40 mil HDPE SM 60 mil HDPE SM 60 mil HDPE TX DS Composite	225,000 126,000 225,000 126,000 702,000	Midshore LF	Easton, MD	May-07	Talbot Co. Dept. of Public Works 28712 Glebe Rd., Easton, MD Ray Clarke 410-770-8170	George & Lynch 150 Lafferty Lane, Dover DE. Mike Hall 302-736-3031	MES 259 Najoles Rd.,Millersville, MD Charles Peng 410-770-8170

Hallaton, Inc.
Geomembrane Experience Resume - 2007

Material	Quantity (sf)	Project	Location	Date	Owner	GC	Engineer
40 mil HDPE TX	50,200	Bowman SWMP	Williamsport, MD	Jul-07	SHA	David H. Martin Excavating 4961 Cumberland Hgwy. Chambersburg PA. 717-264-2168	
Bentomat ST 60 mil HDPE TX 16 oz Non-Woven Geotext.	40,000 40,000 40,000	Blue Ridge Paper	Canton, NC	Jul-07	Blue Ridge Paper Co. 41 Main St. Canton, NC 828-454-0679	Shamrock Environmental 503 Patton Ave. Greensboro, NC Henry Havener 336-375-1989	Sevee & Maher Engineering 4 Blanchard Rd. Cumberland, ME Paul Monroe 207-829-5016
45 mil PPR	88,181	Baltimore SWMP	Baltimore, MD	Aug-07	Chevron Asphatl Facility 1901 Chesapeake Ave. Baltimore, MD 410-576-3795	URS Corp. 13825 Sunrise Valley Dr. Herndon, VA. Ira Merin 703-713-6419	URS Corp. 13825 Sunrise Valley Dr. Herndon, VA. Ira Merin 703-713-6419
80 mil LLDPE TX	29,000	BWI East Tenant Lot	Baltimore, MD	Aug-07	MD. Aviation Aministration - BWI Airport. BWI Airport 410-859-7111	MRC Construction 2129 Baldwin Ave. Crofton, MD.	Michael Baker Jr., Inc. 1304 Concourse Dr. Linthicum, MD
45 mil PPR SS Composite	115,200 14,000	Hanover Foods Lagoon	Hanover, PA	Aug-07	Hanover Foods 1550 York St. Hanover, PA. Dave Still 717-632-6000	Hanover Foods	CET Engineering 1240 N. Mountain Rd. Harrisburg, PA. Tom Whittle 717-541-8004
40 mil HDPE TX	6,290	NAS Patuxent SWMP	Lexington Park, MD	Aug-07	US Government	Great Mills Contruction P.O. Box 52 Great Mills, MD Lee Shaw 301-994-0300	
16 oz Geotextile 30 mil PVC 10 oz Geotextile	49,500 42,000 49,500	Raymark PVC	Manhiem, PA	Sep-07	Raymark Friction 123 E. Stiegel Manhiem. PA 717-665-2211	The Berg Corp 2519 Wilkens Ave. Baltimore, MD. David Berg 410-233-5525	RT Engineering 215 W. Church Rd. King of Prussia, PA. Gary Brown 610-265-1510
Bentomat ST Clay Liner	18,900	Waynesboro GCL Pond	Waynesboro, PA	Sep-07	Waynesboro Public Schools	Leon Wintermyer, Inc. 220 Yocumtown Rd. Etters, PA 717-938-4083	
40 mil LLDPE TX 10 oz Textile DS Composite	379,500 384,750 375,200	Anacostia LF Cap	Hyattsville, MD	Oct-07	Maryland National Capital Parks & Planning Commision 6611 Kenilworth Ave. Riverdale, MD - 301-454-1740	Glover Construction 4493 US 301 Hgwy Pleasant Hill, NC. Ed Marks 252-536-2660	EA Engineering 15 Loveton Circle Sparks, MD Mark Gutberlet 410-771-4950
40 mil HD TX	55,200	Mystic Harbor WWTP	Berlin, MD	Oct-07	Worchester Co. Public Works 6113 Timmons Rd. Snow Hill, MD Gary Serman 410-641-5251	Earthworks P.O. Box 368 Chesapeake Beach, MD Buck Guyther 301-856-1174	J. W. Salm Engineering Sanjeev Kumar 302-436-7570
40 mil LL TX DS Composite	813,852 812,000	Horry Co. LF	Conway, SC	Oct-07	Horry Co. Solid Waste Authority 1886 Hgwy 90 Conway, SC Ricky Hardee 843-347-1651	Thalle Construction 228 S. Churton ST. Hillsborough, NC. Chris Haverstrom 919-245-1490	Garrett & Moore 1428 Aversboro Rd Garner, NC Stefan Bray 919-926-7906

Hallaton, Inc.
Geomembrane Experience Resume - 2007

Material	Quantity (sf)	Project	Location	Date	Owner	GC	Engineer
60 mil HDPE SM 60 mil HDPE TX DS Composite 16 oz Geotextile Woven Geotextile Berm Rain Flap	1,012,000 161,000 173,600 2,146,500 1,182,195 30,200	Brown Station Landfill - Cell 1 & 11	Upper Marlboro, MD	Oct-07	Prince George's County Government Dept. of Waste Management 1220 Caraway Court, Suite 1050 Largo, MD 20774 Russ Yonkers 301-883-5969	Sargent Corporation 4820 Southpoint Dr., Suite 205 Fredericksburg, VA 22407 Travis Ridky 540-898-8362	EA Engineering 15 Loveton Cir. Sparks, MD 21152 Sam Davis 410-771-4950
Claymax 200R Bentomax ST 60 mil HDPE SM 60 mil HDPE TX Composite 10 oz Geotextile 4 oz Geotextile	867,173 242,064 867,173 242,064 1,059,586 867,173 174,421	Ritchie Rubble Landfill Phase II - Cell A & B	Upper Marlboro, MD	Oct-07	Pleasants Construction, Inc. 24024 Frederick Rd. Clarksburg, MD 20871 Mike Ensor 301-428-0800	Ritchie Land Reclamation Partnership 24012 Frederick Rd., Suite 200 Clarksburg, MD 20871 Jim Stewart 301-428-0800	EA Engineering 15 Loveton Cir. Sparks, MD 21152 Geoff Tizard 410-771-4950
40 mil LLDPE	12,000	NAS Patuxent Pad	Lexington Park, MD	Oct-07	US Government	Agviq, LLC 4663 Haygood Rd. Virginia Beach, Va. Jesse Cox 757-449-9262	
60 mil LLDPE TX Geotextile 110 30 mil PVC	1,357,000 1,513,350 151,500	I-70 SWM	Frederick, MD	Nov-07	State Highway Administration Devin Miller	Dewey Jordan 6309 Monocacy Blvd. Frederick, MD 21701 Kim Koerting 301-662-3389	URS Corporation 4 North Park Dr., Suite 300 Hunt Valley, MD 21030 Wayne McFall 410-785-7220
60 mil HDPE TX Geosynthetic clay liner DS Composite	256,500 256,500 256,500	Honeygo Run Landfill - Cell 5	White Marsh, MD	Nov-07	Republic Services Honeygo LF 10710 Philadelphia Rd Perry Hall, MD 21128	Republic Services Honeygo LF 10710 Philadelphia Rd Perry Hall, MD 21128	Earth Tech 4 Neshaminy Interplex Suite 300 Trevose, PA 19053
40 mil LLDPE TX 8oz GE-180 DS Composite	362,250 346,500 360,500	New River LF Cap	Dublin, PA	Dec-07	New River Resource Authority 7100 Cloyds Mountain Rd. Dublin, VA. Joseph Levine	Shamrock Environmental 503 Patton Ave. Greensboro, NC Henry Havener 336-375-1989	Thompson & Litton 6226 University Park Dr. Radford, VA. Kim Fisher 540-633-1897
40 mil HDPE TX	37,500	Wagamons West Shore	Milton, DE	Dec-07		Plesanton Excavating 1058 Middleneck Rd. Warwick, MD Anna Gralewski 410-755-6972	
60mil HDPE DS TX 60mil HDPE SS TX Geosynthetic clay liner SS Geocomposite	118,240 9,450 153,340 9,450	Charles Co. LF No.2 cell 3A	Waldorf, MD	Dec-07	Charles Co. Government Dept. of Public Facilities 10430 Audie Lane La Plata, MD 301-932-3599	Sargent Corporation 4820 Southpoint Dr. Suite 205 Fredericksburg, VA 22407 Travis Ridky 804-240-3382	KCI 10 North Park Dr. Hunt Valley, MD 21030 Jon Meyer 410-316-7800

Total 27,261,235 SF of Geosynthetics Installed

Justin Harward
Geomembrane Experience Resume - 2007

Field Operations Manager on the following job sites:

Material	Quantity	Project	Location	Date
40 mil HDPE TX 40 mil HDPE SM 60 mil HDPE SM 60 mil HDPE TX DS Composite	25,000 sy 14,000 sy 25,000 sy 14,000 sy 78,000 sy	Midshore LF	Easton, MD.	May-07
45 mil PPR	88,181 sf	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST 60 mil HDPE TX 16 oz Non-Woven Geotext.	40,000 sf 40,000 sf 40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
Bentomant ST 40 mil LLDPE Geocomposite Rain Cover	525,000 525,000 525,000 483,000	Johnston Co. LF	Smithfield, NC.	May-07
60 Mil HD TX 10oz Geotextile 6oz Geotextile DS Composite 12 Mil Rain cover 60 mil HD Rain Flap	518,560 sf 478,800 sf 472,500 sf 22,400 sf 461,000 sf 18,860 sf	Butcher Creek LF	Chae City, VA.	Oct-07
45 mil PPR SS Composite	115,200 sf 14,000 sf	Hanover Foods Lagoon	Hanover, PA.	Aug-07
40 mil LL TX	813,852 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07
40 Mil HDPE TX	6,280 sf	NAS Patuxent SWMP	Lesington Park, MD.	Aug-08

Justin Harward
Geomembrane Experience Resume - 2006

Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
36 mil Hypalon	640 SF	Talbot County WWTP	St. Michaels, MD	Mar-06
60 mil HDPE, Sm	652,050 SF	Hanes Mill LF Cell 2	Winston-Salem, NC	Jul-06
60 mil HDPE, Tx	47,150 SF			
GCL	697,500 SF			
12 oz Geotextile	648,000 SF			
8 oz Geotextile	631,350 SF			
Composite	47,600 SF			
20 mil HDPE, Sm	680,000 SF			
40 mil LLDPE, Sm	877,500 SF	Hanes Mill LF Cap	Winston-Salem, NC	Jul-06
40 mil LLDPE, Tx	966,000 SF			
Composite	1,828,400 SF			
GCL	875,250 SF			
Welding Rod	1,012 LBS			
40 mil LLDPE, Tx	151,800 SF	New Hanover County LF	Wilmington, NC	Oct-06
Geocomposite	151,800 SF	Cell 3B-5 Closure		
Woven Geotextile	188,058 SF	WR Grace LF, Cap	Baltimore, MD	Oct-06
10 oz Geotextile	360,000 SF			
GCL	549,000 SF			
60 mil LLDPE	557,550 SF			
40 mil LLDPE, Tx	484,000 SF	RB Baker LF, Closure	Queenstown, MD	Nov-06
Geocomposite	345,000 SF			

Justin Harward
Geomembrane Experience Resume - 2005

Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
45 mil PP	43,000 SF	Idlewilde Dredged Material Placement Site Rehab.	Shadyside, MD	Mar-05
30 mil PVC	6,672 SF	I70/I81 Dry Swale	Hagerstown, MD	Apr-05
60 mil LLDPE, TX 16 oz Geotextile	1,632,000 SF 3,264,975 SF	Newark Water Reservoir	Newark, DE	Apr-05
40 mil HDPE, SM	4,550 SF	Westmoreland Site Vapor Barrier	Arlington, VA	Apr-05
60 mil HDPE, TX	41,227 SF	Lucky Stone Site	Fredericksburg, VA	May-05
60 mil HDPE, TX Geocomposite GCL 28 oz. Geotextile	993,600 SF 74,200 SF 993,600 SF 993,600 SF	Buncombe County LF Cell 6	Alexander, NC	May-05
60 mil HDPE, TX 10 oz. Geotextile Raincover	220,000 SF 220,000 SF 164,700 SF	Corral Farm LF Cell 11 Construction	Warrenton, VA	Sep-05
60 mil HDPE, TX	77,750 SF	Ocean Pines WWTP	Berlin, MD	Oct-05
40 mil LLDPE, TX Geocomposite	405,000 SF 1,055,700 SF	I-95 Landfill Partial Cap	Lorton, VA	Oct-05
60 mil HDPE, TX 60 mil HDPE, SM Geocomposite GCL	133,500 SF 423,000 SF 537,750 SF 269,930 SF	New Hanover Co. LF Cell 6	Wilmington, NC	Nov-05

Arturo Sanchez
Geomembrane Experience Resume - 2007

Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
80 mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750 sf 375,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
Bentomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
40 mil HD TX	55,200 sf	Mystic Harbor WWTP	Berlin, MD	Oct-07
60 mil HDPE, Sm TN220 Drainage net 10 oz Geotextile	31,000 SF 22,500 SF 22,500 SF	Tank Lining Secondary Containment	Salunga, PA	Sep-07
60 mil HDPE, Tx 60 mil HDPE, Sm 10 oz geotextile Composite	177,215 SF 255,725 SF 255,725 SF 381,990 SF	Charles Co. LF	Waldorf, MD	Dec-07
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-08

Arturo Sanchez
Geomembrane Experience Resume - 2006

Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
60 mil LLDPE	140,000 SF	Chester County Prison	West Chester, PA	Mar-06
12 oz Geotextile	267,000 SF	WWTP Lagoon		
40 mil HDPE	290,000 SF	Modern LF Cap	York, PA	Apr-06
250 mil DS Geocomposite	290,000 SF			
10 oz Geotextile	290,000 SF			
40 mil HDPE, Tx	448,500 SF	GE LF, Cap	Rome, GA	Aug-06
Geocomposite	901,600 SF			
Geotextile	51,000 SF			
30 mil HDPE, Sm	81,000 SF	York County Rec Complex	Stewartstown, PA	Aug-06
10 oz Geotextile	81,000 SF			
60 mil HDPE, Sm	532,170 SF	Marshall Station LF, Cell	Terell, NC	Aug-06
60 mil HDPE, Tx	306,590 SF			
GCL	837,825 SF			
Composite	266,000 SF			
Geonet	560,000 SF			
8 oz Geotextile	569,250 SF			
60 mil HDPE, Tx	235,750 SF	Shenandoah LF, Cell	Edinburg, VA	Oct-06
16 oz geotextile	153,000 SF			
12 oz geotextile	130,500 SF			
Composite	94,500 SF			
40 mil HDPE, Sm	37,138 SF	Tank Lining	Salunga, PA	Nov-06
Geotextile	72,000 SF	Secondary Containment		
60 mil HDPE, Tx	506,000 SF	Northern LF, Cell SW-3	Westminster, MD	Dec-06
60 mil HDPE, Sm	1,437,500 SF			
GCL	24,750 SF			
Composite	1,290,800 SF			
40 mil HDPE, Sm	14,625 SF	Mixing Pit Liner	Salunga, PA	Dec-06
8 oz Geotextile	9,000 SF	Kline Facility		

Homero Telles - Supervisor
Geomembrane Experience Resume - 2007

Foreman/Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
40 Mil HDPE TX	25,000 sy	Midshore LF	Easton, MD.	May-07
40 MIL HDPE SM	14,000 sy			
60 MIL HDPE SM	25,000 sy			
60 MIL HDPE TX	14,000 sy			
DS Composite	78,000 sy			
Bentomat ST	805,500 sf	Tuscarora LF	New Bern, NC.	Jan-07
40 Mil LLDPE TX	1,072,260 sf			
Claymat 200 R	270,000 sf			
DS Composite	2,136,400 sf			
45 Mil PPL	2,250 sf	Smithsonian Butterfly House	Washington, DC	Mar-07
40 Mil LLDPE TX	362,500 sf	New River LF Cap	Berlin, MD	Oct-07
8oz GE-180	346,500 sf	Courtland Farms LF	Leesburg, VA.	Apr-07
DS Composite	360,500 sf			
40 Mil HDPE TX	50,200 sf	Bowman SWMP	Williamsport, MD	Jul-07
40 Mil LLDPE TX	379,500 sf	Anacostia LF Cap	Hyattesville, MD.	Oct-07
10 oz Textile	384,750 sf			
DS Composite	375,200 sf			
40 Mil LLDPE TX	362,250 sf	New River LF	Dublin, PA.	Dec-07
8oz GE-180	346,500 sf			
DS Compsoite	360,500 sf			
Bentomat ST	525,000 sf	Johnston Co. LF	Smithfield, NC.	May-07
Geocomposite	525,000 sf			
Rain Cover	483,000 sf			
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-07
12 oz Non Woven	108,000 sf			
60 Mil HDPE DS TX	118,240 sf	Charles Co. LF No.2 Cell 3A	Waldorf, MD.	Feb-08
60 Mil HDPE SS TX	9,450 sf			
Geosynthetic Clay Liner	153,340 sf			
SS Composite	9,450 sf			
40 Mil LLDPE TX	362,500 sf	New River LF Cap	Berlin, MD	Oct-07
8oz GE-180	346,500 sf			
DS Composite	360,500 sf			

Homero Telles
Geomembrane Experience Resume - 2006

Foreman/Master Seamer on the following job sites:

Material	Quantity	Project	Location	Date
60 mil LLDPE	140,000 SF	Chester County Prison	West Chester, PA	Mar-06
12 oz Geotextile	267,000 SF	WWTP Lagoon		
40 mil HDPE	290,000 SF	Modern LF Cap	York, PA	Apr-06
250 mil DS Geocomposite	290,000 SF			
10 oz Geotextile	290,000 SF			
40 mil HDPE, Tx	448,500 SF	GE LF, Cap	Rome, GA	Aug-06
Geocomposite	901,600 SF			
Geotextile	51,000 SF			
30 mil HDPE, Sm	81,000 SF	York County Rec Complex	Stewartstown, PA	Aug-06
10 oz Geotextile	81,000 SF			
60 mil HDPE, Sm	532,170 SF	Marshall Station LF, Cell	Terell, NC	Aug-06
60 mil HDPE, Tx	306,590 SF			
GCL	837,825 SF			
Composite	266,000 SF			
Geonet	560,000 SF			
8 oz Geotextile	569,250 SF			
60 mil HDPE, Tx	235,750 SF	Shenandoah LF, Cell	Edinburg, VA	Oct-06
16 oz geotextile	153,000 SF			
12 oz geotextile	130,500 SF			
Composite	94,500 SF			
40 mil HDPE, Sm	37,138 SF	Tank Lining	Salunga, PA	Nov-06
Geotextile	72,000 SF	Secondary Containment		
60 mil HDPE, Tx	506,000 SF	Northern LF, Cell SW-3	Westminster, MD	Dec-06
60 mil HDPE, Sm	1,437,500 SF			
GCL	24,750 SF			
Composite	1,290,800 SF			
40 mil HDPE, Sm	14,625 SF	Mixing Pit Liner	Salunga, PA	Dec-06
8 oz Geotextile	9,000 SF	Kline Facility		

Mauricio Sanchez
Geomembrane Experience Resume - 2007

Foreman/QC on the following job sites:

Material	Quantity	Project	Location	Date
45 Mil PPR	88,181 sf	Baltimore SWMP	Baltimore, MD	Aug-08
80 Mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, Md.	Aug-07
40 Mil HDPE TX	25,000 sy	Midshore LF	Easton, MD	May-07
40 Mil HDPE SM	14,000 sy			
60 Mil HDPE Sm	25,000 sy			
60 Mil HDPE TX	14,000 sy			
DS Composite	78,000 sy			
Bentomat ST	40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-08
60 Mil HDPE TX	40,000 sf			
16 oz NW Geotextile	40,000 sf			
60 Mil HD TX	518,500 sf	Butcher Creek LF	Chase City, VA.	Oct-07
10oz Geotextile	478,800 sf			
6oz Geotextile	472,500 sf			
DS Composite	22,400 sf			
12 Mil Rain Cover	481,000 sf			
60 Mil HD Rain Flap	18,860 sf			
45 Mil PPR	115,200 sf	Hanover Foods	Hanover, PA.	Aug-07
SS Compsoite	14,000 sf			
40 Mil LL TX	813,852 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07

Mauricio Sanchez
Geomembrane Experience Resume - 2006

Foreman/QC/Master Seamer on the following job sites:

Material	Quantity	Project	Location	Date
36 mil Hypalon	640 SF	Talbot County WWTP	St. Michaels, MD	Mar-06
60 mil HDPE, Sm	652,050 SF	Hanes Mill LF Cell 2	Winston-Salem, NC	Jul-06
60 mil HDPE, Tx	47,150 SF			
GCL	697,500 SF			
12 oz Geotextile	648,000 SF			
8 oz Geotextile	631,350 SF			
Composite	47,600 SF			
20 mil HDPE, Sm	680,000 SF			
40 mil LLDPE, Sm	877,500 SF	Hanes Mill LF Cap	Winston-Salem, NC	Jul-06
40 mil LLDPE, Tx	966,000 SF			
Composite	1,828,400 SF			
GCL	875,250 SF			
Welding Rod	1,012 LBS			
40 mil LLDPE, Tx	151,800 SF	New Hanover County LF	Wilmington, NC	Oct-06
Geocomposite	151,800 SF	Cell 3B-5 Closure		
Woven Geotextile	188,058 SF	WR Grace LF, Cap	Baltimore, MD	Oct-06
10 oz Geotextile	360,000 SF			
GCL	549,000 SF			
60 mil LLDPE	557,550 SF			
40 mil LLDPE, Tx	484,000 SF	RB Baker LF, Closure	Queenstown, MD	Nov-06
Geocomposite	345,000 SF			

Alex Lopez
Geomembrane Experience Resume - 2007

Foreman/Supervisor the following job sites:

Material	Quantity	Project	Location	Date
80 mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750 sf 375,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
Bentomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
40 mil HD TX	55,200 sf	Mystic Harbor WWTP	Berlin, MD	Oct-07
60 mil HDPE, Sm TN220 Drainage net 10 oz Geotextile	31,000 sf 22,500 sf 22,500 sf	Tank Lining Secondary Containment	Saturga, PA	Sep-07
60 mil HDPE, Tx 60 mil HDPE, Sm 10 oz geotextile Composite	177,215 sf 255,725 sf 255,725 sf 381,990 sf	Charles Co. LF	Waldorf, MD	Dec-07
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-08
Bentomat ST 40 mil LLDPE Tex DS Composite Claymas 200R	805,500 sf 1,072,260 sf 2,136,400 sf 270,000 sf	Tuscarora LF	New Bern, NC	Jan-07
45 mil PPL	2,520 sf	Smithsonian Butterfly House	Washington, DC	Mar-07
60 mil HDPE TX	242,450 sf	Courtland Farms LF	Leesburg, VA	Apr-07
Bentomant ST Geocomposite 40 mil LL TX Rain Cover	525,000 sf 525,000 sf 525,000 sf 483,000 sf	Johnston Co. LF	Smithfield, NC.	May-07

Alex Lopez
Geomembrane Experience Resume - 2006

Foreman/Master Seamer the following job sites:

Material	Quantity	Project	Location	Date
60 mil LLDPE	140,000 SF	Chester County Prison	West Chester, PA	Mar-06
12 oz Geotextile	267,000 SF	WWTP Lagoon		
40 mil HDPE	290,000 SF	Modern LF Cap	York, PA	Apr-06
250 mil DS Geocomposite	290,000 SF			
10 oz Geotextile	290,000 SF			
40 mil HDPE, Tx	448,500 SF	GE LF, Cap	Rome, GA	Aug-06
Geocomposite	901,600 SF			
Geotextile	51,000 SF			
30 mil HDPE, Sm	81,000 SF	York County Rec Complex	Stewartstown, PA	Aug-06
10 oz Geotextile	81,000 SF			
60 mil HDPE, Sm	532,170 SF	Marshall Station LF, Cell	Terell, NC	Aug-06
60 mil HDPE, Tx	306,590 SF			
GCL	837,825 SF			
Composite	266,000 SF			
Geonet	560,000 SF			
8 oz Geotextile	569,250 SF			
60 mil HDPE, Tx	235,750 SF	Shenandoah LF, Cell	Edinburg, VA	Oct-06
16 oz geotextile	153,000 SF			
12 oz geotextile	130,500 SF			
Composite	94,500 SF			
40 mil HDPE, Sm	37,138 SF	Tank Lining	Salunga, PA	Nov-06
Geotextile	72,000 SF	Secondary Containment		
60 mil HDPE, Tx	506,000 SF	Northern LF, Cell SW-3	Westminster, MD	Dec-06
60 mil HDPE, Sm	1,437,500 SF			
GCL	24,750 SF			
Composite	1,290,800 SF			
40 mil HDPE, Sm	14,625 SF	Mixing Pit Liner	Salunga, PA	Dec-06
8 oz Geotextile	9,000 SF	Kline Facility		

Luis Ordones
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 mil HDPE TX	25,000 sy	Midshore LF	Easton, MD.	May-07
40 mil HDPE SM	14,000 sy			
60 mil HDPE SM	25,000 sy			
60 mil HDPE TX	14,000 sy			
DS Composite	78,000 sy			
45 mil PPR	88,181 sf	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST	40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
60 mil HDPE TX	40,000 sf			
16 oz Non-Woven Geotext.	40,000 sf			
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
40 mil LLDPE	525,000			
Geocomposite	525,000			
Rain Cover	483,000			
60 Mil HD TX	518,560 sf	Butcher Creek LF	Chae City, VA.	Oct-07
10oz Geotextile	478,800 sf			
6oz Geotextile	472,500 sf			
DS Composite	22,400 sf			
12 Mil Rain cover	481,000 sf			
60 mil HD Rain Flap	18,860 sf			
45 mil PPR	115,200 sf	Hanover Foods Lagoon	Hanover, PA.	Aug-07
SS Composite	14,000 sf			
40 mil LL TX	813,852 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07

Marcial Ramos
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
80 mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750 sf 376,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
Bentomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
40 mil HD TX	55,200 sf	Mystic Harbor WWTP	Berlin, MD	Oct-07
60 mil HDPE, Sm TN220 Drainage net 10 oz Geotextile	31,000 SF 22,500 SF 22,500 SF	Tank Lining Secondary Containment	Salunga, PA	Sep-07
60 mil HDPE, Tx 60 mil HDPE, Sm 10 oz geotextile Composite	177,215 SF 255,725 SF 255,725 SF 381,990 SF	Charles Co. LF	Waldorf, MD	Dec-07
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-08

Ramiro Olvera
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
Bentomat ST	805,500	Tuscarora LF	New Bern, NC	Jan-07
40 mil LLDPE Tex	1,072,260			
DS Composite	2,136,400			
Claymas 200R	270,000			
45 mil PPL	2,520	Smithsonian Butterfly House	Washington, DC	Mar-07
60 mil HDPE TX	242,450	Courtland Farms LF	Leesburg, VA	Apr-07
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
Geocomposite	525,000			
40 mil LL TX	525,000			
Rain Cover	483,000			

Roberto Ordonez - Master Seamer
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 mil HDPE TX	25,000 sy	Midshore LF	Easton, MD.	May-07
40 mil HDPE SM	14,000 sy			
60 mil HDPE SM	25,000 sy			
60 mil HDPE TX	14,000 sy			
DS Composite	78,000 sy			
45 mil PPR	88,181 sf	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST	40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
60 mil HDPE TX	40,000 sf			
16 oz Non-Woven Geotext.	40,000 sf			
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
40 mil LLDPE	525,000			
Geocomposite	525,000			
Rain Cover	483,000			
60 Mil HD TX	518,560 sf	Butcher Creek LF	Chse City, VA.	Oct-07
10oz Geotextile	478,800 sf			
6oz Geotextile	472,500 sf			
DS Composite	22,400 sf			
12 Mil Rain cover	481,000 sf			
60 mil HD Rain Flap	18,860 sf			
45 mil PPR	115,200 sf	Hanover Foods Lagoon	Hanover, PA.	Aug-07
SS Composite	14,000 sf			
40 mil LL TX	813,852 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07
40 Mil HDPE TX	6,290 sf	NAS Paluxent SWMP	Lexington Park, MD.	Aug-08

Trinidad Montes
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
Bentomat ST	805,500	Tuscarora LF	New Bern, NC	Jan-07
40 mil LLDPE Tex	1,072,260			
DS Composite	2,136,400			
Claymas 200R	270,000			
45 mil PPL	2,520	Smithsonian Butterfly House	Washington, DC	Mar-07
60 mil HDPE TX	242,450	Courtland Farms LF	Leesburg, VA	Apr-07
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
Geocomposite	525,000			
40 mil LL TX	525,000			
Rain Cover	483,000			

Edilzar Anzueto
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 Mil HDPE TX 40 Mil HDPE SM 60 Mil HDPE Sm 60 Mil HDPE TX DS Composite	25,000 sy 14,000 sy 25,000 sy 14,000 sy 78,000 sy	Midshore LF	Easton, MD.	May-07
45 Mil PPR	88,181 sf	Baltimore SWMP	Baltimore, MD.	Aug-07
Bentomat ST 60 Mil HDPE TX 16oz NW Geotextile	40,000 sf 40,000 sf 40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
80 Mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750sf 375,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
45 Mil PPR SS Composite	115,200 sf 14,000 sf	Hanover Foods	Hanover, PA.	Aug-07
40 Mil LLDPE TX	813,862 sf	Horry Co. LF	Conway, SC.	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07
80 Mil LLDPE SM 12 oz NW	60,375 sf 108,000 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-07

Carlos Sanchez
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 mil HDPE TX 40 mil HDPE SM 60 mil HDPE SM 60 mil HDPE TX DS Composite	25,000 sy 14,000 sy 25,000 sy 14,000 sy 78,000 sy	Midshore LF	Easton, MD.	May-07
45 mil PPR	88,181 sf	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST 60 mil HDPE TX 16 oz Non-Woven Geotext.	40,000 sf 40,000 sf 40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
Bentomant ST 40 mil LLDPE Geocomposite Rain Cover	525,000 525,000 525,000 483,000	Johnston Co. LF	Smithfield, NC.	May-07
60 Mil HD TX 10oz Geotextile 6oz Geotextile DS Composite 12 Mil Rain cover 60 mil HD Rain Flap	518,560 sf 478,800 sf 472,500 sf 22,400 sf 481,000 sf 18,860 sf	Butcher Creek LF	Chae City, VA.	Oct-07
45 mil PPR SS Composite	115,200 sf 14,000 sf	Hanover Foods Lagoon	Hanover, PA.	Aug-07
40 mil LL TX	813,652 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07

Francisco Fernandez
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
Bentomat ST	805,500	Tuscarora LF	New Bern, NC	Jan-07
40 mil LLDPE Tex	1,072,260			
DS Composite	2,136,400			
Claymas 200R	270,000			
45 mil PPL	2,520	Smithsonian Butterfly House	Washington, DC	Mar-07
60 mil HDPE TX	242,450	Courtland Farms LF	Leesburg, VA	Apr-07
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
Geocomposite	525,000			
40 mil LL TX	525,000			
Rain Cover	483,000			

Herminio Vasquez
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 Mil LLDPE TX	379,500 sf	Anacostia LF Cap	Hyattesville, MD.	Oct-07
10 oz Textile	384,750 sf			
DS Composite	375,200 sf			
Bentomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
40 Mil HD TX	55,200 sf	Mystic Harbor WWTP	Berlin, MD.	Oct-07
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-07
12oz Non Woven	108,000 sf			

Ignacio Fernandez
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 mil HDPE TX	25,000 sy	Midshore LF	Easton, MD.	May-07
40 mil HDPE SM	14,000 sy			
60 mil HDPE SM	25,000 sy			
60 mil HDPE TX	14,000 sy			
DS Composite	78,000 sy			
45 mil PPR	88,181 sf	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST	40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
60 mil HDPE TX	40,000 sf			
16 oz Non-Woven Geotext.	40,000 sf			
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
40 mil LLDPE	525,000			
Geocomposite	525,000			
Rain Cover	483,000			
60 Mil HD TX	518,560 sf	Butcher Creek LF	Chae City, VA.	Oct-07
10oz Geotextile	478,800 sf			
8oz Geotextile	472,500 sf			
DS Composite	22,400 sf			
12 Mil Rain cover	481,000 sf			
60 mil HD Rain Flap	18,860 sf			
45 mil PPR	115,200 sf	Hanover Foods Lagoon	Hanover, PA.	Aug-07
SS Composite	14,000 sf			
40 mil LL TX	813,852 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07

APPENDIX B-3

LLDPE Liner QC Log (CQC-100)

FORM CQC - 100
LINER PROJECT QC LOG
(One sheet per project)

PROJECT

NAME: North Wake Phase II Closure Project

NUMBER: 6172-55752

LOCATION: Raleigh, NC

Owner: Wake County

ADDRESS: 9004 Deponie Dr, Raleigh, NC, 27613

CONTACT: John Roberson PHONE: (919) 856-6365

ENGINEERING

ENGINEERING FIRM: CDM

ADDRESS: 5400 Glenwood Ave., Ste.300, Raleigh, NC 27612

CONTACT: Robert Brossoie PHONE: (919) 787-5620

CONTRACTOR

GENERAL CONTRACTOR: Thalle Construction

ADDRESS: 900 NC Highway 86 North Hillsborough, NC 27278

CONTACT: Ryan Coward PHONE: 336-516-2712

SUPPLIER OF LINER MATERIALS

NAME: Hallaton Inc.

ADDRESS: 1206 Sparks Rd, MD, 21152

CONTACT: Kennedy Gerber PHONE: (410) 583-7700

FORM CQC - 100
LINER PROJECT QC LOG
(One sheet per project)
(Continued)

QC INSPECTION

NAME: Camp Dresser & McKee (CDM)

ADDRESS: 5400 Glenwood Ave. Suite 300, Raleigh, NC, 27612

CONTACT: Farouk Banna PHONE: 336-255-0107

TESTING LABORATORY

LINER TESTING LABORATORY: TRI- Environmental Inc.

ADDRESS: 9063 Bee Caves Road, Austin, TX 78733

CONTACT: Dr. Mansukh Patel PHONE: 1-800-880-8378

FABRICATOR OF MATERIAL

NAME: Agru America

ADDRESS: 500 Garrison Road, Georgetown, SC, 29440

CONTACT: Anne Steacy PHONE: (713) 432 0322

INSTALLER OF MATERIAL

NAME: Hallaton Inc.

ADDRESS: 1206 Sparks Rd, MD, 21152

CONTACT: Kennedy Gerber PHONE: (410) 583-7700

LINER MATERIALS

SPECIFIED LINER MATERIALS: LLDPE THICKNESS & TYPE: 40 mil textured

MATERIAL CERTIFICATION

MATERIAL CERTIFICATION RECEIVED: Yes

DATE: 8/11/2008 ACCEPTED: Yes

APPENDIX B-4

LLDPE Liner Personnel QC Log (CQC-102)

FORM CQC - 102
PERSONNEL QC LOG
(Installation & field seaming personnel)
(Complete for each mobilization or change of personnel)

PROJECT NAME: North Wake Phase 2 Closure

DATE: 08-13-2008 PROJECT NUMBER: 6172-55752

SAFETY MEETING CONDUCTED ON MATERIALS HANDLING: Yes

GIVEN BY: Mark Raynar DATE: 8-13-2008

SUPERINTENDENT OF INSTALLATION: Ryan Coward

CREW PERSONNEL

CREW LEADER: Arthuro Sanchez - Supervisor

HELPER: Edilzar Anzueto – QA forms and as-built drawings

OTHER CREW MEMBERS

NAME: Martial Ramos ROLE: Seamer

NAME: Martin Martinez ROLE: Seamer

NAME: Carlos Fernandez ROLE: Seamer

NAME: Victor Smith ROLE: Labor

NAME: Serafin Sanchez ROLE: Labor

NAME: Martin Lugo ROLE: Labor

NAME: Javier Ponse ROLE: Labor

NAME: Salvador Sanchez ROLE: Labor

SIGNED: Farouk Banna

QC Inspector

FORM CQC - 102
PERSONNEL QC LOG
(Installation & field seaming personnel)
(Complete for each mobilization or change of personnel)

PROJECT NAME: North Wake Phase 2 Closure

DATE: 01-30-2009 PROJECT NUMBER: 6172-55752

SAFETY MEETING CONDUCTED ON MATERIALS HANDLING: _____

GIVEN BY: Mark Raynar DATE: 1/30/2009

SUPERINTENDENT OF INSTALLATION: Ryan Coward

CREW PERSONNEL

CREW LEADER: Ignacio Fernandez (Nacho) - Supervisor

HELPER: Alegandro Lopez (Alex) – QA forms and as-built drawings

OTHER CREW MEMBERS

NAME: Cesar Martinez ROLE: Seamer

NAME: Diego Rivas ROLE: Seamer

NAME: Gregorio Yanez ROLE: Labor

NAME: German Yanez ROLE: Labor

NAME: Amando Cortez ROLE: Labor

NAME: Jaime Ortega ROLE: Labor

NAME: Valentin Pacheco ROLE: Labor

NAME: Juan Valazquez ROLE: Labor

NAME: Esdras Fernandez ROLE: Labor

SIGNED: Farouk Banna

QC Inspector

Arturo Sanchez
Geomembrane Experience Resume - 2007

Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
80 mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750 sf 375,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
Bentomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
40 mil HD TX	55,200 sf	Mystic Harbor WWTP	Berlin, MD	Oct-07
60 mil HDPE, Sm TN220 Drainage net 10 oz Geotextile	31,000 SF 22,500 SF 22,500 SF	Tank Lining Secondary Containment	Selunga, PA	Sep-07
60 mil HDPE, Tx 60 mil HDPE, Sm 10 oz geotextile Composite	177,215 SF 255,725 SF 255,725 SF 381,990 SF	Charles Co. LF	Waldorf, MD	Dec-07
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-08

Arturo Sanchez
Geomembrane Experience Resume - 2006

Supervisor on the following job sites:

Material	Quantity	Project	Location	Date
60 mil LLDPE	140,000 SF	Chester County Prison	West Chester, PA	Mar-06
12 oz Geotextile	267,000 SF	WWTP Lagoon		
40 mil HDPE	290,000 SF	Modern LF Cap	York, PA	Apr-06
250 mil DS Geocomposite	290,000 SF			
10 oz Geotextile	290,000 SF			
40 mil HDPE, Tx	448,500 SF	GE LF, Cap	Rome, GA	Aug-06
Geocomposite	901,600 SF			
Geotextile	51,000 SF			
30 mil HDPE, Sm	81,000 SF	York County Rec Complex	Stewartstown, PA	Aug-06
10 oz Geotextile	81,000 SF			
60 mil HDPE, Sm	532,170 SF	Marshall Station LF, Cell	Terell, NC	Aug-06
60 mil HDPE, Tx	306,590 SF			
GCL	837,825 SF			
Composite	266,000 SF			
Geonet	560,000 SF			
8 oz Geotextile	569,250 SF			
60 mil HDPE, Tx	235,750 SF	Shenandoah LF, Cell	Edinburg, VA	Oct-06
16 oz geotextile	153,000 SF			
12 oz geotextile	130,500 SF			
Composite	94,500 SF			
40 mil HDPE, Sm	37,138 SF	Tank Lining	Salunga, PA	Nov-06
Geotextile	72,000 SF	Secondary Containment		
60 mil HDPE, Tx	506,000 SF	Northern LF, Cell SW-3	Westminster, MD	Dec-06
60 mil HDPE, Sm	1,437,500 SF			
GCL	24,750 SF			
Composite	1,290,800 SF			
40 mil HDPE, Sm	14,625 SF	Mixing Pit Liner	Salunga, PA	Dec-06
8 oz Geotextile	9,000 SF	Kline Facility		

Marcial Ramos
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
80 mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750 sf 376,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
Bentomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
40 mil HD TX	55,200 sf	Mystic Harbor WWTP	Berlin, MD	Oct-07
60 mil HDPE, Sm TN220 Drainage net 10 oz Geotextile	31,000 SF 22,500 SF 22,500 SF	Tank Lining Secondary Containment	Salunga, PA	Sep-07
60 mil HDPE, Tx 60 mil HDPE, Sm 10 oz geotextile Composite	177,215 SF 255,725 SF 255,725 SF 381,990 SF	Charles Co. LF	Waldorf, MD	Dec-07
80 Mil LLDPE SM	60,375 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-08

Edilzar Anzueto
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 Mil HDPE TX 40 Mil HDPE SM 60 Mil HDPE Sm 60 Mil HDPE TX DS Composite	25,000 sy 14,000 sy 25,000 sy 14,000 sy 78,000 sy	Midshore LF	Easton, MD.	May-07
45 Mil PPR	88,181 sf	Baltimore SWMP	Baltimore, MD.	Aug-07
Bentomat ST 60 Mil HDPE TX 16oz NW Geotextile	40,000 sf 40,000 sf 40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
80 Mil LLDPE TX	29,000 sf	BWI East Tenant Lot	Baltimore, MD.	Aug-07
40 Mil LLDPE TX 10oz Textile DS Composite	379,500 sf 384,750sf 375,200 sf	Anacostia LF Cap	Hyattsville, MD.	Oct-07
45 Mil PPR SS Composite	115,200 sf 14,000 sf	Hanover Foods	Hanover, PA.	Aug-07
40 Mil LLDPE TX	813,862 sf	Horry Co. LF	Conway, SC.	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07
80 Mil LLDPE SM 12 oz NW	60,375 sf 108,000 sf	Dundalk Marine Terminal	Dundalk, MD.	Dec-07

Martin Martinez - Master Seamer
Geomembrane Experience Resume - 2007

Master Seamer on the following job sites:

Material	Quantity (sf)	Project	Location	Date
40 Mil HDPE TX	225,000	Midshore LF	Easton, MD.	May-07
40 MIL HDPE SM	126,000			
60 MIL HDPE SM	225,000			
60 MIL HDPE TX	126,000			
DS Composite	702,000			
Bentomat ST	805,500	Tuscarora LF	New Bern, NC.	Jan-07
40 Mil LLDPE TX	1,072,260			
Claymat 200 R	270,000			
DS Composite	2,136,400			
45 Mil PPL	2,250	Smithsonian Butterfly House	Washington, DC	Mar-07
40 Mil LLDPE TX	362,500	New River LF Cap	Berlin, MD	Oct-07
8oz GE-180	346,500	Courtland Farms LF	Leesburg, VA.	Apr-07
DS Composite	360,500			
40 Mil HDPE TX	50,200	Bowman SWMP	Williamsport, MD	Jul-07
40 Mil LLDPE TX	379,500	Anacostia LF Cap	Hyattesville, MD.	Oct-07
10 oz Textile	384,750			
DS Composite	375,200			
40 Mil LLDPE TX	362,250	New River LF	Dublin, PA.	Dec-07
8oz GE-180	346,500			
DS Compsoite	360,500			
Bentomat ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
Geocomposite	525,000			
Rain Cover	483,000			
80 Mil LLDPE SM	60,375	Dundalk Marine Terminal	Dundalk, MD.	Dec-07
12 oz Non Woven	108,000			
60 Mil HDPE DS TX	118,240	Charles Co. LF No.2 Cell 3A	Waldorf, MD.	Feb-08
60 Mil HDPE SS TX	9,450			
Geosynthetic Clay Liner	153,340			
SS Composite	9,450			
40 Mil LLDPE TX	362,500	New River LF Cap	Berlin, MD	Oct-07
8oz GE-180	346,500			
DS Composite	360,500			

Total: 12,080,165

Juan Carlos Fernandez - Master Seamer
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity (sf)	Project	Location	Date
40 mil HDPE TX	225,000	Midshore LF	Easton, MD.	May-07
40 mil HDPE SM	126,000			
60 mil HDPE SM	225,000			
60 mil HDPE TX	126,000			
DS Composite	702,000			
45 mil PPR	88,181	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST	40,000	Blue Ridge Paper	Canton, NC.	Jul-07
60 mil HDPE TX	40,000			
16 oz Non-Woven Geotext.	40,000			
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
40 mil LLDPE	525,000			
Geocomposite	525,000			
Rain Cover	483,000			
60 Mil HD TX	518,560	Butcher Creek LF	Chae City, VA.	Oct-07
10oz Geotextile	478,800			
6oz Geotextile	472,500			
DS Composite	22,400			
12 Mil Rain cover	481,000			
60 mil HD Rain Flap	18,860			
45 mil PPR	115,200	Hanover Foods Lagoon	Hanover, PA.	Aug-07
SS Composite	14,000			
40 mil LL TX	813,852	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500	Raymark PVC	Manhiem, PA.	Sep-07
40 Mil HDPE TX	6,290	NAS Patuxent SWMP	Lesington Park, MD.	Aug-08

Total: 6,661,143

*** IAGI- Certified Welding Technician (CWT)**

Juan Carlos Fernandez - Master Seamer
Geomembrane Experience Resume - 2006

Master Seamer on the following job sites:

Material	Quantity (sf)	Project	Location	Date
36 mil Hypalon	640	Talbot County WWTP	St. Michaels, MD	Mar-06
60 mil HDPE, Sm	652,050	Hanes Mill LF Cell 2	Winston-Salem, NC	Jul-06
60 mil HDPE, Tx	47,150			
GCL	697,500			
12 oz Geotextile	648,000			
8 oz Geotextile	631,350			
Composite	47,600			
20 mil HDPE, Sm	680,000			
40 mil LLDPE, Sm	877,500	Hanes Mill LF Cap	Winston-Salem, NC	Jul-06
40 mil LLDPE, Tx	966,000			
Composite	1,828,400			
GCL	875,250			
40 mil LLDPE, Tx	151,800	New Hanover County LF	Wilmington, NC	Oct-06
Geocomposite	151,800	Cell 3B-5 Closure		
Woven Geotextile	188,058	WR Grace LF, Cap	Baltimore, MD	Oct-06
10 oz Geotextile	360,000			
GCL	549,000			
60 mil LLDPE	557,550			
40 mil LLDPE, Tx	484,000	RB Baker LF, Closure	Queenstown, MD	Nov-06
Geocomposite	345,000			

Total: 10,738,648

*** IAGI- Certified Welding Technician (CWT)**

Alex Lopez
Geomembrane Experience Resume - 2007

Foreman/Supervisor the following job sites:

Material	Quantity	Project	Location	Date
0 mil LLDPE TX	29,000 sf ✓	BWI East Tenant Lot	Baltimore, MD.	Aug-07
) Mil LLDPE TX	379,500 sf ✓	Anacostia LF Cap	Hyattsville, MD.	Oct-07
)oz Textile	384,750 sf			
3 Composite	375,200 sf			
ntomat ST Clay Liner	18,900 sf	Waynesboro GCL Pond	Waynesboro, PA.	Sep-07
mil HD TX	55,200 sf ✓	Mystic Harbor WWTP	Berlin, MD	Oct-07
mil HDPE, Sm	31,000 sf ✓	Tank Lining	Salunga, PA	Sep-07
220 Drainage net	22,500 sf	Secondary Containment		
oz Geotextile	22,500 sf			
nil HDPE, Tx	177,215 sf ✓	Charles Co. LF	Waldorf, MD	Dec-07
nil HDPE, Sm	255,725 sf ✓			
z geotextile	255,725 sf			
posite	381,990 sf			
Ill LLDPE SM	60,375 sf ✓	Dundalk Marine Terminal	Dundalk, MD.	Dec-08
omat ST	805,500 sf	Tuscarora LF	New Bern, NC	Jan-07
il LLDPE Tex	1,072,260 sf ✓			
omposite	2,136,400 sf			
nas 200R	270,000 sf			
I PPL	2,520 sf	Smithsonian Butterfly House	Washington, DC	Mar-07
HDPE TX	242,450 sf	Courtland Farms LF	Leesburg, VA	Apr-07
nant ST	525,000 sf	Johnston Co. LF	Smithfield, NC.	May-07
mposite	525,000 sf			
LL TX	525,000 sf			
over	483,000 sf			

Alex Lopez ok

Geomembrane Experience Resume - 2006

Foreman/Master Seamer the following job sites:

Material	Quantity	Project	Location	Date
60 mil LLDPE	140,000 SF	Chester County Prison	West Chester, PA	Mar-06
12 oz Geotextile	267,000 SF	WWTP Lagoon		
40 mil HDPE	290,000 SF	Modern LF Cap	York, PA	Apr-06
250 mil DS Geocomposite	290,000 SF			
10 oz Geotextile	290,000 SF			
40 mil HDPE, Tx	448,500 SF	GE LF, Cap	Rome, GA	Aug-06
Geocomposite	901,600 SF			
Geotextile	51,000 SF			
30 mil HDPE, Sm	81,000 SF	York County Rec Complex	Stewartstown, PA	Aug-06
10 oz Geotextile	81,000 SF			
60 mil HDPE, Sm	532,170 SF	Marshall Station LF, Cell	Terell, NC	Aug-06
60 mil HDPE, Tx	306,590 SF			
GCL	837,825 SF			
Composite	266,000 SF			
Geonet	560,000 SF			
8 oz Geotextile	569,250 SF			
60 mil HDPE, Tx	235,750 SF	Shenandoah LF, Cell	Edinburg, VA	Oct-06
16 oz geotextile	153,000 SF			
12 oz geotextile	130,500 SF			
Composite	94,500 SF			
40 mil HDPE, Sm	37,138 SF	Tank Lining	Salunga, PA	Nov-06
Geotextile	72,000 SF	Secondary Containment		
60 mil HDPE, Tx	506,000 SF	Northern LF, Cell SW-3	Westminster, MD	Dec-06
80 mil HDPE, Sm	1,437,500 SF			
GCL	24,750 SF			
Composite	1,290,800 SF			
40 mil HDPE, Sm	14,625 SF	Mixing Pit Liner	Salunga, PA	Dec-06
8 oz Geotextile	9,000 SF	Kline Facility		

Ignacio Fernandez
Geomembrane Experience Resume - 2007

Master Seamer on the following jobs:

Material	Quantity	Project	Location	Date
40 mil HDPE TX	25,000 sy	Midshore LF	Easton, MD.	May-07
40 mil HDPE SM	14,000 sy			
60 mil HDPE SM	25,000 sy			
60 mil HDPE TX	14,000 sy			
DS Composite	78,000 sy			
45 mil PPR	88,181 sf	Baltimore SWMP	Baltimore MD.	Aug-07
Bentomat ST	40,000 sf	Blue Ridge Paper	Canton, NC.	Jul-07
60 mil HDPE TX	40,000 sf			
16 oz Non-Woven Geotext.	40,000 sf			
Bentomant ST	525,000	Johnston Co. LF	Smithfield, NC.	May-07
40 mil LLDPE	525,000			
Geocomposite	525,000			
Rain Cover	483,000			
60 Mil HD TX	518,560 sf	Butcher Creek LF	Chae City, VA.	Oct-07
10oz Geotextile	478,800 sf			
6oz Geotextile	472,500 sf			
DS Composite	22,400 sf			
12 Mil Rain oover	481,000 sf			
60 mil HD Rain Flap	18,860 sf			
45 mil PPR	115,200 sf	Hanover Foods Lagoon	Hanover, PA.	Aug-07
SS Composite	14,000 sf			
40 mil LL TX	813,852 sf	Horry Co. LF	Conway, SC	Oct-07
16oz Geotextile	49,500 sf	Raymark PVC	Manhiem, PA.	Sep-07

APPENDIX B-5

Tensionmeter Calibration Certificate

DEMTECH Services Inc.

CALIBRATION CERTIFICATE

Customer Name:	Hallaton, Inc.	110 Volt	X
Unit Make & Model Number:	Accura-Lite	220 Volt	
Tensiometer Serial Number:	NAL-0999	Lbs.	X
		Kg.	

Device Calibrated:	S-Type load cell
Range:	0 - 500 lbs. Tension
Model No:	M2300-500
Serial No:	155044
Readout Model No:	DPM-3
Readout Serial No:	212038
Channel No:	N/A

Calibration Apparatus:
Dead Weight system w/
Fluke Model 187 Multimeter

W1	N/A	R1	N/A
W2	N/A	R2	N/A
W3	N/A	R3	N/A

Indicator reading with no load: 0

Applied Force lbs.	Output (mv):	Display reading:	Deviation Error:
2	-0.114	2	0.00
52	1.764	52	0.00
102	3.658	102	0.00
152	5.528	152	0.00
202	7.433	202	0.00
252	9.308	252	0.00
302	11.21	302	0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 10 V DC

Scale Factor (1):	N/A	Offset (1):	N/A
Scale Factor (2):	N/A	Offset (2):	N/A
Brake point:	N/A	Calibration Check #	N/A

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: Readout and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated readouts and load cells are not interchangeable.

Calibrated by: Jeff Hicks Date: 07/23/08

Demtech Services, Inc.

Placerville, California, USA

CALIBRATION CERTIFICATE

Customer Name: **Hallaton**

Tensiometer Model: Pro-Tester T-0100

Device Calibrated: S-Type load cell
Range: 0 - 750 lbs. Tension
Model No: M2405-750#
Serial No: **220066**

Calibration Apparatus:

Reference load cell (S/N 204781)

A/D Module Model No: T-029
A/D Module Serial No: **5106220066**
Channel No: N/A

Dead Weight:		Reference Cell:	
W1	2	R1	2
W2	152	R2	152
W3	302	R3	302

Indicator reading with no load: 0

Offset: **5.310790** Scale: **4.229439**

Applied Force lbs.	Cell Response:	Deviation Error:
2	2	0.00
52	52	0.00
102	102	0.00
152	152	0.00
202	202	0.00
252	252	0.00
302	302	0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician: Dean Cato Date: 05/08/08

Demtech Services, Inc.

Placerville, California, USA

CALIBRATION CERTIFICATE

Customer Name: **Hallaton**

Tensiometer Model: Pro-Tester T-0100

Device Calibrated: S-Type load cell
Range: 0 - 750 lbs. Tension
Model No: M2405-750#
Serial No: **222095**

Calibration Apparatus:

Reference load cell (S/N 204781)

A/D Module Model No: T-029
A/D Module Serial No: **1907222095**
Channel No: N/A

Dead Weight:

W1	2
W2	152
W3	302

Reference Cell:

R1	2
R2	152
R3	302

Indicator reading with no load: 0

Offset: **1.702314** Scale: **4.129421**

Applied Force lbs.	Cell Response:	Deviation Error:
2	2	0.00
52	52	0.00
102	102	0.00
152	152	0.00
202	202	0.00
252	252	0.00
302	302	0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician: Dean Cato Date: 05/08/08