Dare County
Roanoke Island Water System Improvements
Roanoke Island, North Carolina

Geotechnical Data Report

April 2010

Final Report

Dare County
Roanoke Island Water System Improvements
Roanoke Island, North Carolina

Geotechnical Data Report

April 2010

Prepared By:

I. Sacit Akbas, P.E.
Geotechnical Engineer

Reviewed By:

Danielle K. Neamtu, P.E.
Senior Geotechnical Engineer

Contents

Tables

Figures

Section 1
Introduction

1.1 Project Description

Camp Dresser & McKee (CDM) has been retained by Dare County to provide design and permitting services for the Roanoke Island Water System Improvements project located in Roanoke Island, North Carolina. The improvements will consist of installation of approximately 56 miles of 2- to 16-inch diameter water transmission main/distribution pipeline, construction of a new 2.0 million gallon (MG) ground storage tank at the Skyco Water Treatment Plant (WTP), construction of a new 300,000 gallon elevated tank, and improvements to the finished water pumps and associated equipment at the Skyco WTP.

1.2 Purpose and Scope

This Geotechnical Data Report (GDR) has been prepared by CDM to provide data from the geotechnical investigation(s) for the project including logs, soundings, drilling procedures, soil sample descriptions, and laboratory testing. The scope of work for the investigation(s) included the following:

- Perform one (1) geotechnical test boring (B-1) and three (3) cone penetration test (CPT) soundings (CPT-1 through CPT-3) at the proposed ground storage tank site;
- Perform two (2) geotechnical test borings (B-2 and B-3) and two (2) CPT soundings (CPT-4 and CPT-5) at the proposed elevated water tank site;
- Perform twenty-four (24) geotechnical test borings (B-5 through B-12, B-14, and B-16 through B-30) and ten (10) hand augers (HA-9, HA-11, HA-13, HA-16, HA-20, HA-24 through HA-26, HA-36, and HA-51) at the proposed trenchless road and stream crossings;
- Perform three (3) geotechnical test borings (B-4, B-13, and B-15) and forty-three (43) hand augers (HA-1 through HA-8, H-10, HA-12, HA-14, HA-15, HA-17 through HA-19, HA-21 through HA-23, HA-27 through HA-35, HA-37 through HA-50, HA-52, and HA-53) along the proposed transmission main/distribution pipeline; and
- Conduct geotechnical laboratory testing consisting of moisture content tests, grain size analyses, grain size analyses with hydrometer, Atterberg limits tests, organic content tests, and standard Proctor tests on selected soil samples.

1.3 Elevation Datum

All elevations noted herein are reported in feet and referenced to the North American Vertical Datum (NAVD) of 1988.

1.4 Report Limitations

This report has been prepared for the Roanoke Island Water System Improvements project in Roanoke Island, North Carolina as understood at this time and described in this report. No other warranty, express or implied, is made.

Section 2
Subsurface Investigation and Testing

2.1 Site Conditions

Roanoke Island is approximately 11 miles long and 2 miles wide and is located between the mainland and the northern beaches in Dare County, North Carolina, approximately 50 miles south of the Virginia state line. The island lies within Croatan Sound, between the mainland and Bodie Island, south of Albemarle Sound and north of Pamlico Sound. The north, north-central, and south parts of the island are generally well-developed, with residential and commercial properties located throughout. The south-central part of the island is mostly undeveloped.

In general, the existing grades on Roanoke Island range from EL. 0 to EL. 16.

2.1.1 Ground Storage Tank Site

The proposed ground storage tank site is in the southeastern corner of the existing Skyco WTP property located on Water Plant Road in central Roanoke Island, near the intersection of US-64/264 and NC-345.

The proposed ground storage tank will be south of the existing maintenance building and surrounded by wetlands to the east and south. The existing grades are relatively flat and vary gradually from EL. 2 to EL. 3.5. The ground storage tank site is mostly grass-covered except for a small debris pile (approximately 30 feet in diameter) containing brush and tree trunks in the center of the tank footprint that was present at the time of the drilling.

2.1.2 Elevated Storage Tank Site

The proposed elevated storage tank site is near the entrance of the closed Bowsertown Landfill located west to northwest of the intersection of California and Bowsertown Roads. The site is bounded by the closed landfill to the west and by California Road to the east. The existing grades are relatively flat and vary gradually from EL. 5 to EL. 6. The elevated storage tank site is asphalt-paved except for a pile of dredged marine material in the center and western side of the tank footprint that was present at the time of the drilling. The dredged material appeared to be up to 2 feet thick based upon field observations.

2.1.3 Transmission Main and Distribution Pipeline

The proposed transmission main and distribution pipeline alignments abut both urban and rural areas, consisting of residential and commercial properties, several state roads, and small streams. The existing site grades range from about EL. 0 to EL. 16.

2.2 Regional Geology

The project area is located in the Coastal Plain of far eastern North Carolina. Roanoke Island and the Outer Banks are barrier islands, separating the estuarine environments of Albemarle, Croatan, and Pamlico Sounds from the marine environment of the Atlantic Ocean. Surficial deposits in the area consist primarily of marine-related sediments including fine to coarse sands and gravel with frequent shell beds, and minor amounts of silt and clay with roots, leaves, and charcoal.

2.3 Subsurface Explorations

The subsurface explorations consisted of geotechnical test borings, CPT soundings, and hand augers and were performed in three phases to cover the five design packages (DP#1 through DP#5) included in this project. The Phase 1 and Phase 2 of the subsurface explorations addressed DP#1 and DP#2, respectively. Phase 3 of the subsurface explorations addressed DP#3 through DP#5. The approximate exploration locations are shown on **Figures 2-1** through **2-7**. Refer to the Contract Drawings for surveyed geotechnical test boring and CPT sounding locations.

2.3.1 Geotechnical Test Borings

A total of thirty (30) geotechnical test borings (B-1 through B-30) were drilled by GET Solutions, Inc. (GET) of Elizabeth City, North Carolina in three phases as described above. Phase 1 of the drilling included the tank sites and was performed between September 29 and October 1, 2009. Phase 2 and Phase 3 of the drilling, covering the trenchless crossings and pipeline portions of the work, were performed between December 16 and 18, 2009 and February 19 and 24, 2010, respectively.

Geotechnical test boring B-1 was drilled at the proposed ground storage tank site and was advanced to a depth of 70 feet below ground surface. Geotechnical test borings B-2 and B-3 were drilled at the proposed elevated storage tank site to depths of 70 and 100 feet below ground surface, respectively. The depth of the remaining geotechnical test borings performed at the trenchless crossing locations ranged from 25 to 40 feet below the ground surface.

Geotechnical test borings were drilled by a CME 45C truck-mounted drilling rig and a CME 55 ATV-mounted drilling rig. Borings were advanced using mud-rotary drilling techniques. In general, split-spoon sampling was conducted continuously for the first 12 to 20 feet below ground surface and at 5-foot-intervals thereafter. Split-spoon sampling was performed in accordance with ASTM D1586 (2-inch-diameter sampler driven 24 inches by blows from a 140-pound hammer falling freely for a 30-inch drop). The number of blows required to drive the sampler each 6-inch increment was recorded and the Standard Penetration Resistance (N-value) was determined as the sum of the blows over the 2nd and 3rd 6-inch increments of the 24-inch drive.

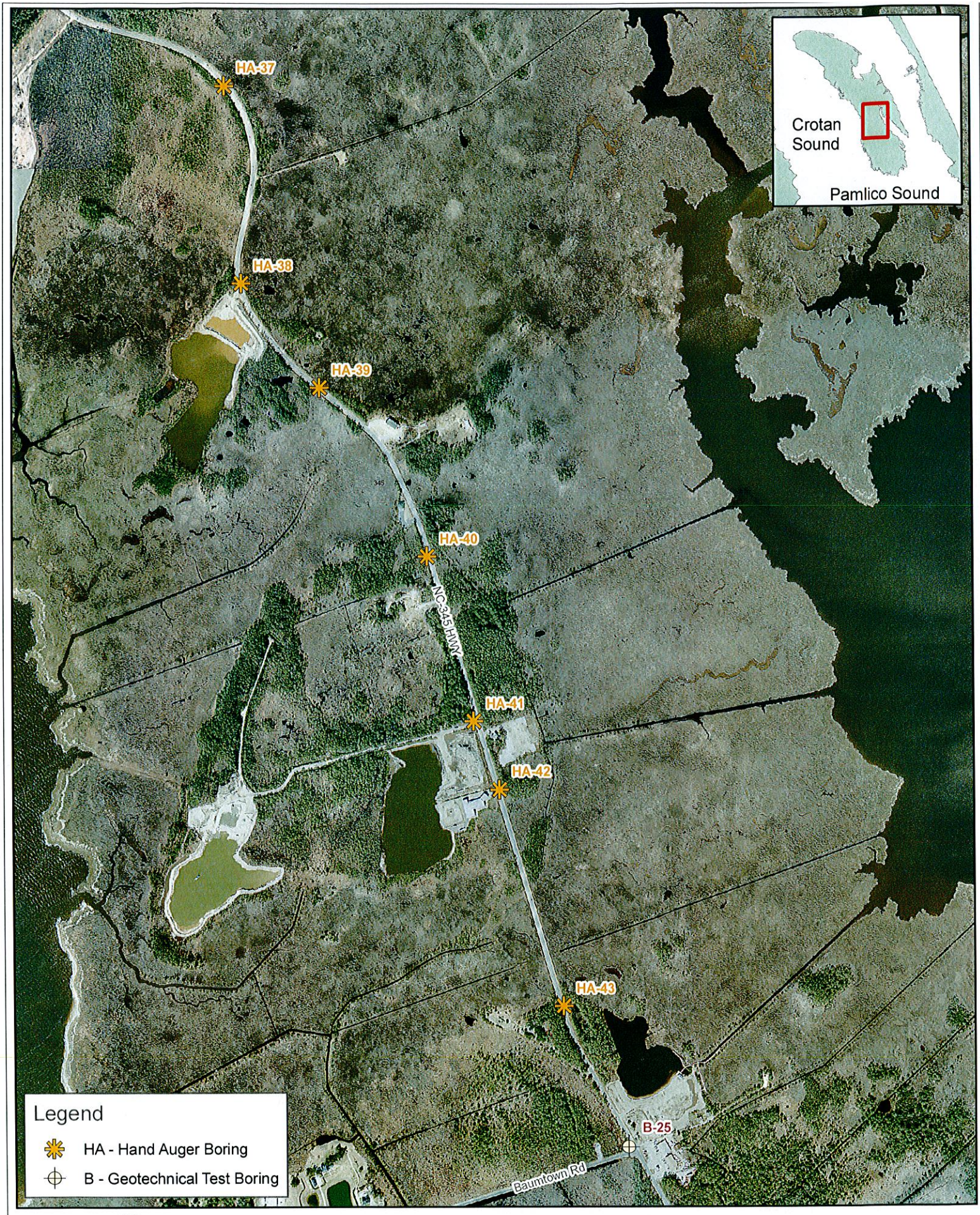
Figure 2-1
Approximate Subsurface Exploration Locations

CDM

Figure 2-2
Approximate Subsurface Exploration Locations

Figure 2-3
Approximate Subsurface Exploration Locations

Figure 2-4
Approximate Subsurface Exploration Locations



1 in = 1,000 ft

0 500 1,000 2,000 Feet

CDM

Figure 2-5
Approximate Subsurface Exploration Locations

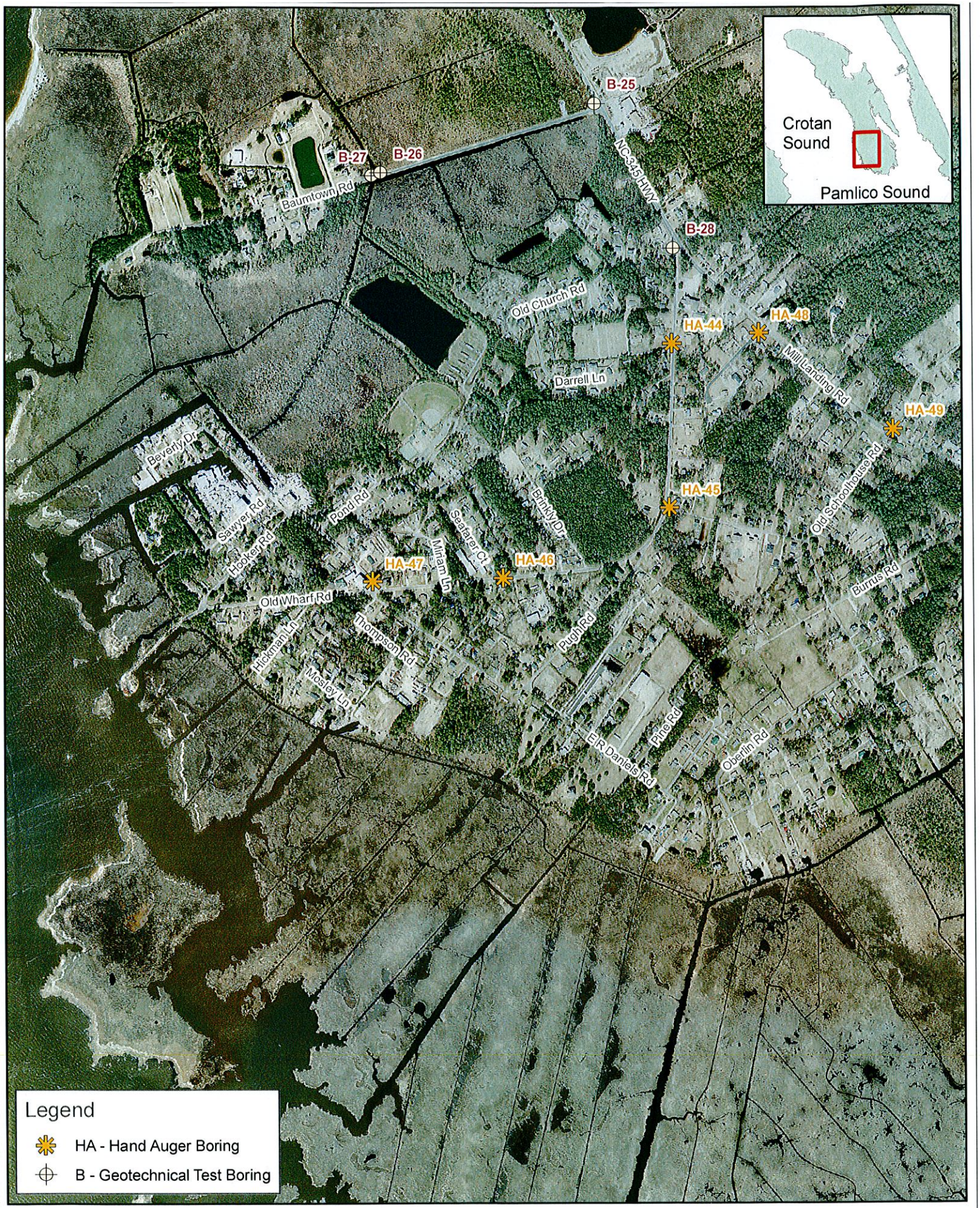


Figure 2-6
Approximate Subsurface Exploration Locations

Figure 2-7
Approximate Subsurface Exploration Locations

Representative soil samples were taken from each split-spoon sample and stored in jars for later review and laboratory testing. During Phase 1 and Phase 2 of the subsurface exploration program, a CDM geotechnical engineer observed the geotechnical test borings in the field and visually classified the soil samples in accordance with the Burmister soil identification system. Each soil sample was also given a Unified Soil Classification System (USCS) designation. During Phase 3 of the subsurface exploration program, a field engineer from GET observed the borings in the field and visually classified the soil samples in accordance with USCS. A summary of the geotechnical test borings is presented in **Table 2-1** and the boring logs, prepared by CDM and GET, are included in **Appendix A** of this report.

All geotechnical test borings were either grouted to the ground surface or backfilled with bentonite pellets upon completion. Groundwater levels in the borings were estimated from the condition of the samples obtained.

2.3.2 Cone Penetration Test Soundings

A total of five (5) CPT soundings (CPT-1 through CPT-5) were performed on September 23rd, 2009 using a 25-ton track-mounted hydraulic-push rig. CPT-1 through CPT-3 were performed at the proposed ground storage tank site and CPT-4 and CPT-5 were performed at the proposed elevated storage tank site. One of the CPT soundings at each site included shear wave velocity measurements to obtain a shear wave velocity profile of the soils. All CPT soundings were terminated at a depth of 100 feet below existing ground surface.

The piezocone is an *in-situ* deep-testing device that uses electrical transducers to obtain a nearly continuous depth profile of point resistance and sleeve friction on a cylindrical section immediately above the tip. These data are then used to evaluate *in-situ* soil properties such as shear strength, relative density, friction angle, elastic modulus, undrained shear strength, and hydraulic conductivity with respect to depth. The piezocone soundings were performed in general accordance with ASTM D5778 using a cone penetrometer with a data acquisition system. Readings of tip resistance, sleeve friction, and pore pressure were taken every 0.07 feet (2 cm). The tip resistance was measured as the force over the projected area of the cone tip. The measured tip resistance is corrected for porewater pressure. The sleeve friction is used to differentiate between soil types and can be expressed by the friction ratio (sleeve friction divided by corrected tip pressure).

There is a small rugged velocity seismometer located in the piezocone to measure the shear wave velocity. The miniature seismometer is placed in the horizontal direction and orientated transverse to the signal source to detect the horizontal component of the shear wave arrivals. A suitable seismic signal source, preferentially generate large amplitude shear waves with little or no compressional wave component, is needed for shear wave production and strikes with a sledge hammer were used as the source for this project.

Dare County
Roanoke Island Water System Improvements
Roanoke Island, North Carolina

Table 2-1
Summary of Geotechnical Test Borings

Test Boring No.	Boring Location	Ground Surface EL. [1] (ft)	Total Drilling Depth (ft)	Depth to Groundwater [2] (ft)
B-1	Ground Storage Tank	2.33	70	4.0
B-2	Elevated Tank	6.01	70	6.0
B-3	Elevated Tank	5.40	100	6.0
B-4	Stream @ HWY-345	1.48	35	8.0
B-5	US-64 @ HWY-345	2.21	35	8.0
B-6	US-64 @ HWY-345	5.62	35	9.0
B-7	Marshall C Collins	3.83	40	7.0
B-8	Marshall C Collins	2.33	40	6.0
B-9	Cypress Cove	2.73	30	2.0
B-10	Cypress Cove	3.64	30	4.0
B-11	Stream @ California	2.55	35	8.0
B-12	Stream @ California	4.06	35	6.0
B-13	Sir Walter Raleigh @ California	5.45	25	3.0
B-14	Burnside @ Scarborough	4.87	30	5.0
B-15	Scarborough @ Burnside	7.04	25	5.0
B-16	Stream @ Burnside	2.72	35	5.0
B-17	Stream @ Burnside	3.01	35	4.0
B-18	US-64 @ Etheridge	15.99	25	7.0
B-19	US-64 @ Airport	15.17	25	7.0
B-20	US-64 @ Brakewood	12.64	25	6.5
B-21	US-64 @ Amanda	7.96	25	4.0
B-22	Stream @ Battlefield	3.08	30	4.0
B-23	Stream @ Battlefield	2.98	30	4.0
B-24	HWY-345 @ Water Plant	3.08	25	3.0
B-25	HWY-345 @ Baumtown	3.12	25	4.0
B-26	Stream @ Baumtown	1.63	40	4.0
B-27	Stream @ Baumtown	2.40	30	4.0
B-28	HWY-345 @ Old Wharf	4.69	25	3.0
B-29	Stream @ Thicket Lump	1.97	30	2.0
B-30	Stream @ Thicket Lump	2.71	30	1.0

Notes:

1. Elevations based on the National American Vertical Datum (NAVD) of 1988.
2. Groundwater levels were noted during drilling and should not be considered to represent stabilized groundwater conditions.

The CPT results and shear wave velocity profiles are included in **Appendix B**.

2.3.3 Hand Auger Borings

A total of fifty-three (53) hand auger borings (HA-1 through HA-53) were performed by GET in two phases using a 3.25-diameter carbon steel hand auger. Hand augers HA-1 through HA-13 were performed during Phase 2 of subsurface explorations between December 28 and 29, 2009. Hand augers HA-14 through HA-53 were performed during Phase 3 of subsurface explorations between February 24 and March 8, 2010.

Representative soil samples were taken from each hand auger boring and stored in jars for later review. The soil samples were classified in accordance with the Unified Soil Classification System (USCS). The hand auger boring logs, prepared by GET, are included in **Appendix C** of this report.

2.3.4 Variation in Subsurface Conditions

The interpretation of general soil conditions presented herein is based on soil and groundwater conditions observed at the exploration locations. However, subsurface conditions can be expected to vary between the exploration locations.

Water levels obtained from the test borings should not necessarily be considered to represent stabilized groundwater levels. In addition, water levels are expected to fluctuate with season, temperature, climate, construction in the area, and other factors. Actual conditions during construction may be different from those observed at the time of the explorations.

2.4 Laboratory Test Results

Geotechnical laboratory testing was conducted on selected split-spoon samples as follows:

- Fifty (50) moisture contents were determined in accordance with ASTM D2216;
- Forty-six (46) grain size analyses were performed in accordance with ASTM D422;
- Four (4) grain size analyses with hydrometer tests were performed in accordance with ASTM D422;
- Two (2) Atterberg limits tests were performed in accordance with ASTM D4318;
- Seven (7) organic contents were determined in accordance with ASTM D2974; and

- Two (2) standard Proctor tests were performed in accordance with ASTM D698.

Laboratory test results are summarized in **Table 2-2** and the complete testing results are included in **Appendix C** of this report.

Dare County
Roanoke Island Water System Improvements
Roanoke Island, North Carolina

Table 2-2
Summary of Laboratory Test Results - Design Package 1

Test Boring No.	Sample No.	Sample Depth (ft)	Grain Size Analysis [1] (%)				Moisture Content [2] (%)	Organic Content [3] (%)	Atterberg Limits [4] (%)	
			Gravel	Sand	Fines				LL	PI
					Silt	Clay				
B-1	S-2	2.0-4.0	3.5	93.8	2.7		13.1	0.8	---	---
B-1	S-5	8.0-10.0	0.0	93.0	6.0	1.0	26.4	1.8	---	---
B-1	S-8	18.0-20.0	0.8	98.4	0.8		21.3	---	---	---
B-1	S-10	28.0-30.0	0.0	99.1	0.9		21.2	---	---	---
B-1	S-16	58.0-60.0	1.0	84.3	14.7		24.0	---	---	---
B-2	S-2B	3.0-4.0	0.0	82.7	17.3		12.8	1.0	---	---
B-2	S-7	13.0-15.0	0.0	98.8	1.2		20.4	---	---	---
B-2	S-16	58.0-60.0	10.3	78.9	10.8		17.6	---	---	---
B-3	S-5	8.0-10.0	0.0	99.2	0.8		21.7	---	---	---
B-3	S-6	10.0-12.0	0.0	99.2	0.8		19.3	---	---	---
B-3	S-11	33.0-35.0	0.0	96.2	3.8		13.8	---	---	---
B-3	S-16	58.0-60.0	0.2	80.9	14.2	4.7	29.0	---	---	---
B-3	S-21	83.0-85.0	0.6	82.9	16.5		24.8	---	---	---
B-3	S-23	93.0-95.0	0.0	46.5	42.7	10.8	37.2	---	---	---
B-3	S-24	98.0-100.0	0.0	6.8	76.4	16.8	19.1	---	58	36

Notes:

1. Grain size analyses were conducted in accordance with ASTM D422.
2. Moisture contents were determined in accordance with ASTM D2216.
3. Organic contents were determined in accordance with ASTM D2974.
4. Atterberg limits test was conducted in accordance with ASTM D4318.

Abbreviations:

LL Liquid Limit
PI Plasticity Index
--- Test not conducted on this sample

Dare County
Roanoke Island Water System Improvements
Roanoke Island, North Carolina

Table 2-2 - continued
Summary of Laboratory Test Results - Design Package 2

Test Boring No.	Sample No.	Sample Depth (ft)	Grain Size Analysis [1] (%)			Moisture Content [2] (%)	Organic Content [3] (%)
			Gravel	Sand	Fines		
B-5	S-5	8.0-10.0	0.0	98.1	1.9	27.1	---
B-5	S-8	14.0-16.0	0.0	96.2	3.8	25.4	---
B-5	S-12	23.0-25.0	3.6	94.0	2.4	17.2	---
B-6	S-4	6.0-8.0	0.6	92.3	7.1	12.5	---
B-7	S-10/B	18.5-20.0	3.5	95.2	1.3	19.7	---
B-8	S-4	6.0-8.0	0.0	89.3	10.7	22.9	---
B-8	S-11/T	23.0-24.5	22.6	77.0	0.4	10.7	---
B-9	S-5	8.0-10.0	3.5	93.8	2.7	25.5	---
B-9	S-10	18.0-20.0	10.3	89.5	0.2	16.2	---
B-10	S-8	14.0-16.0	1.3	97.7	1.0	20.7	---
B-11	S-5	8.0-10.0	0.0	99.3	0.7	23.4	---
B-11	S-7	12.0-14.0	0.0	98.9	1.1	19.2	---
B-12	S-2/B	2.5-4.0	0.0	80.2	19.8	10.4	0.9
B-12	S-7	12.0-14.0	20.4	78.3	1.3	17.2	---
B-13	S-5	8.0-10.0	0.0	68.2	31.8	106.2	---
B-13	S-9	16.0-18.0	11.1	88.2	0.7	14.1	---
B-14	S-2	2.0-4.0	0.0	72.3	27.7	21.0	---
B-14	S-5	8.0-10.0	0.0	98.5	1.5	20.9	---

Notes:

1. Grain size analyses were conducted in accordance with ASTM D422.
2. Moisture contents were determined in accordance with ASTM D2216.
3. Organic contents were determined in accordance with ASTM D2974.

Abbreviation:

--- Test not conducted on this sample

Dare County
Roanoke Island Water System Improvements
Roanoke Island, North Carolina

Table 2-2 - continued
Summary of Laboratory Test Results - Design Packages 3 through 5

Test Boring No.	Sample No.	Sample Depth (ft)	Grain Size Analysis [1] (%)			Moisture Content [2] (%)	Organic Content [3] (%)	Atterberg Limits [4] (%)		Standard Proctor [5]	
			Gravel	Sand	Fines			LL	PI	Maximum Dry Density (pcf)	Optimum Moisture (%)
B-18	S-4	6.0-8.0	0.0	99.5	0.5	20.6	---	---	---	---	---
B-19	S-3	4.0-6.0	0.0	99.2	0.8	5.6	---	---	---	---	---
B-20	S-3	4.0-6.0	0.0	97.9	2.1	19.0	---	---	---	---	---
B-21	S-4	6.0-8.0	0.0	98.9	1.1	23.6	---	---	---	---	---
B-22	S-3	4.0-6.0	0.0	90.3	9.7	19.7	---	---	---	---	---
B-22	S-5	8.0-10.0	0.0	99.5	0.5	22.1	---	---	---	---	---
B-23	S-4	6.0-8.0	0.0	98.7	1.3	22.2	---	---	---	---	---
B-24	S-2/B	3.0-4.0	0.0	68.8	31.2	15.0	---	---	---	---	---
B-24	S-3/B	5.0-6.0	0.0	98.5	1.5	23.0	---	---	---	---	---
B-25	S-3	4.0-6.0	0.0	94.3	5.7	23.1	---	---	---	---	---
B-26	S-4	6.0-8.0	---	---	---	---	70.7	---	---	---	---
B-26	S-6	10.0-12.0	0.0	91.0	9.0	27.8	---	---	---	---	---
B-26	S-9/T	16.0-17.5	---	---	---	---	54.1	---	---	---	---
B-27	S-3	4.0-6.0	0.0	94.6	5.4	28.6	3.7	---	---	---	---
B-27	S-6/B	11.0-12.0	0.0	5.0	95.0	62.7	---	66	45	---	---
B-28	S-3	4.0-6.0	0.0	86.8	13.2	29.8	---	---	---	---	---
B-29	S-2/B	3.0-4.0	0.0	67.5	32.5	29.7	---	---	---	---	---
B-30	S-1	0.5-2.0	0.0	94.7	5.3	22.9	---	---	---	107.9	12.6
HA-24	B-1	0.5-1.5	0.0	86.8	13.2	12.7	---	---	---	110	12.6

Notes:

1. Grain size analyses were conducted in accordance with ASTM D422.
2. Moisture contents were determined in accordance with ASTM D2216.
3. Organic contents were determined in accordance with ASTM D2974.
4. Atterberg limits test was conducted in accordance with ASTM D4318.
5. Standard Proctor tests were conducted in accordance with ASTM D698.

Abbreviations:

LL	Liquid Limit
PI	Plasticity Index
---	Test not conducted on this sample

Appendix A

Geotechnical Test Boring Logs

Phases 1 and 2

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-1

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 2.33
Drilling Method/Rig: Mud Rotary/CME 45C
Total Depth (ft.): 70
Drillers: Will Riddick
Depth to Initial Water Level (ft. BGS): 4
Drilling Date: Start: 9-29-09 **End:** 9-29-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 793,964.10 E 2,989,209.80
Logged By: D. Caldwell

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			2.3					
			0				FILL	Moist, loose, dark brown, fine SAND, some silt, trace organic material (wood, leaves). **-FILL-**
SS	S-1	24/24		6	2 3 3 4			
SS	S-2	24/20		7	2 3 4 6			Moist, loose, grayish brown, fine to medium SAND, trace silt, gravel, shell (sand to gravel size) fragments, organic material.
SS	S-3	24/22	-2.7 5	8	6 5 3 3			Wet, loose, grayish brown, fine to medium SAND, trace silt, gravel, shell (sand size) fragments.
SS	S-4	24/24		7	1 2 5 6		SP-SM	Wet, loose, dark brown, fine SAND, trace to little silt, trace organic material (wood).
SS	S-5	24/20		6	2 2 4 7			Wet, loose, dark brown, fine SAND, trace silt, clay, organic material (wood).
			-7.7 10					
SS	S-6	24/18		15	4 8 7 6			Wet, medium dense, brown, fine SAND, trace silt, clay.
SS	S-7	24/20		9	2 4 5 7		SP	Wet, loose, brown, fine SAND, trace silt.
			-12.7					

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 4/13/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-1

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-12.7 15				SP	
SS	S-8	24/14	-17.7 20	4	1 2 2 2			Wet, very loose to loose, brown, fine to medium SAND, trace silt, gravel.
SS	S-9	24/12	-22.7 25	2	1 1 1 1			Wet, very loose, brownish gray, fine to medium SAND, trace gravel.
SS	S-10	24/10	-27.7 30	3	1 2 1 2			Wet, very loose, light brown, fine to medium SAND, trace silt.
SS	S-11	24/12	-32.7 35	3	1 2 1 2			Wet, very loose, brown to dark gray, fine to medium SAND, little gravel, trace silt.
					8 16			Wet, dense, gray, fine to medium SAND, trace silt, shell (sand size) fragments.

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-1

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S-12	24/24		38	22 25		SP	
			-37.7 40					
SS	S-13	24/18		25	5 9 16 24		SP	Wet, medium dense, brown, fine to medium SAND, trace shell (sand size) fragments.
			-42.7 45				SP	Wet, medium dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments, weak cementation.
SS	S-14	24/20		71	16 37 34 37			Wet, medium dense, gray, fine to medium SAND.
			-47.7 50					Wet, dense, gray, fine SAND, trace shell (sand size) fragments.
SS	S-15	24/18		25	9 14 11 14			Wet, medium dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments.
			-52.7 55					
SS	S-16	24/20		5	2 3 2 5		SM	Wet, loose, gray, fine to medium SAND, little silt, trace shell (sand to gravel size) fragments.
			-57.7 60					

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-1

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S-17	24/18	-62.7 / 65	14	3 5 9 13		SM	Wet, medium dense, gray, fine SAND, little silt, shell (sand to gravel size) fragments.
SS	S-18	24/20	-67.7 / 70	17	5 10 7 12		SM	Wet, medium dense, gray, fine SAND, little silt, trace shell (sand to gravel size) fragments.
			-72.7 / 75					Boring terminated at 70 feet below ground surface.
			-77.7 / 80					
			-82.7 / 85					

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-2

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 6.01
Drilling Method/Rig: Mud Rotary/CME 45C
Total Depth (ft.): 70
Drillers: Will Riddick
Depth to Initial Water Level (ft. BGS): 6
Drilling Date: Start: 9-29-09 **End:** 9-30-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 798,852.80 E 2,983,822.20
Logged By: D. Caldwell

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			6.0					
SS	S-1	24/10	0	3	1 1 2 9		SP	Moist, very loose, dark grayish brown, fine SAND, trace gravel, organic material (charcoal).
SS	S-2	24/24		13	9 8 5 5		SC	Moist, medium dense, grayish brown, fine SAND. Moist, medium dense, dark grayish brown, fine to medium SAND, little clay, trace organic material (leaves).
SS	S-3	24/24	1.0 5	10	4 5 5 6		SP	Moist to wet, loose to medium dense, brown, fine SAND.
SS	S-4	24/23		20	7 10 10 10			Wet, medium dense, brownish gray, fine SAND.
SS	S-5	24/18		12	2 6 6 7			Wet, medium dense, brownish gray, fine SAND.
SS	S-6	24/15	-4.0 10	8	2 4 4 4			Wet, loose, brownish gray, fine to coarse SAND, trace gravel.
SS	S-7	24/18	-9.0	4	1 2 2 3			Wet, very loose to loose, dark brown, fine to medium SAND, trace silt.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-2

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-9.0 / 15				SP	
SS	S-8	24/13		7	1 3 4 5			Wet, loose, gray, fine to coarse SAND, trace gravel. Wet, loose, gray, fine SAND.
			-14.0 / 20					
SS	S-9	24/21		33	7 14 19 20			Wet, dense, gray, fine SAND. Wet, dense, gray, fine to medium SAND, trace shell (sand size) fragments. Wet, dense, gray, fine SAND.
			-19.0 / 25					
SS	S-10	24/15		26	12 14 12 9		SP	Wet, medium dense, gray, fine to medium SAND, little shell (sand size) fragments, trace gravel.
			-24.0 / 30					
SS	S-11	24/20		37	9 20 17 20			Wet, dense, gray, fine to medium SAND, little shell (sand size) fragments, trace gravel.
			-29.0 / 35					
					10 19			Wet, dense, gray, fine to medium SAND, little shell (sand size) fragments, trace gravel.

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-2

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S-12	24/19	-34.0	38	19 23		SP	
			40					
SS	S-13	24/18	-39.0	43	11 22 21 28			Wet, dense, gray, fine to medium SAND, little shell (sand to gravel size) fragments.
			45					
SS	S-14	24/24	-44.0	31	13 14 17 20			Wet, dense, gray, fine to medium SAND, little shell (sand to gravel size).
			50					
SS	S-15	24/19	-49.0	56	7 22 34 43			Wet, very dense, gray, fine to medium SAND, some shell (sand size) fragments. Wet, very dense, gray, fine to medium SAND, little shell (sand size) fragments, trace silt.
			55					
SS	S-16	24/24	-54.0	10	2 4 6 8		SP-SM	Wet, loose to medium dense, gray, fine to medium SAND, little silt, shell (sand to gravel size) fragments, trace clay.
			60					

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-2

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S-17	24/15		62	14 31 31 32		SP	Wet, very dense, gray, fine SAND, trace shell (sand size) fragments.
			-59.0 65					
SS	S-18	24/24		127	20 52 75 70			Wet, very dense, gray, fine SAND. Wet, very dense, dark gray, fine to medium SAND, trace shell (sand size) fragments.
			-64.0 70					
								Boring terminated at 70 feet below ground surface.
			-69.0 75					
			-74.0 80					
			-79.0 85					

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-3

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 5.40
Drilling Method/Rig: Mud Rotary/CME 45C
Total Depth (ft.): 100
Drillers: Will Riddick
Depth to Initial Water Level (ft. BGS): 6
Drilling Date: Start: 10-1-09 **End:** 10-1-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 798,886.00 E 2,983,809.90
Logged By: D. Caldwell

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			5.4					
SS	S-1	24/14	0	7	2 3 4 6		SP	Moist, loose, grayish brown, fine SAND.
SS	S-2	24/21		17	4 8 9 12			Moist, medium dense, brown, fine SAND.
SS	S-3	24/24	0.4 5	21	4 9 12 15			Moist, medium dense, gray, fine SAND.
SS	S-4	24/24		24	12 14 10 9			Wet, medium dense, gray, fine SAND.
SS	S-5	24/18		12	4 5 7 7			Wet, medium dense, brownish gray, fine to medium SAND, trace silt.
SS	S-6	24/18	-4.6 10	7	2 3 4 4			Wet, loose, brown, fine to medium SAND, trace silt.
SS	S-7	24/18	-9.6	6	2 3 3 3			Wet, loose, brown, fine to medium SAND, trace silt.

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-3

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-9.6 / 15				SP	
SS	S-8	24/15		4	2 1 3 5			Wet, very loose to loose, brown, fine to medium SAND, trace silt. Wet, very loose to loose, gray, fine to medium SAND.
			-14.6 / 20					
SS	S-9	24/20		28	6 14 14 20			Wet, medium dense, dark gray, fine SAND. (One-inch-thick shell layers at 23.5 and 24.5 feet below ground surface.) Wet, medium dense, gray, fine to medium SAND, little gravel.
			-19.6 / 25					
SS	S-10	24/15		23	11 13 10 10		SP	Wet, medium dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments, little gravel.
			-24.6 / 30					
SS	S-11	24/24		29	3 12 17 19			Wet, medium dense, gray, fine to medium SAND, some shell (sand size) fragments, trace silt.
			-29.6 / 35				SP	
					12 19			Wet, dense, gray, fine to medium SAND, trace silt, gravel, shell (sand size) fragments.

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-3

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S-12	24/17	-34.6 / 40	43	24 27		SP	
SS	S-13	24/20	-39.6 / 45	46	10 20 26 32			Wet, dense, gray, fine to medium SAND, trace shell (sand size) fragments.
SS	S-14	24/15	-44.6 / 50	62	15 30 32 36			Wet, very dense, gray, fine to medium SAND, trace shell (sand size) fragments.
SS	S-15	24/20	-49.6 / 55	50	6 23 27 27		SP	Wet, dense to very dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments, trace gravel.
SS	S-16	24/22	-54.6 / 60	9	3 4 5 5		SM	Wet, loose, gray, fine to medium SAND, little silt, shell (sand to gravel size) fragments, trace clay, gravel.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-3

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S-17	23/23		68	8 24 44 50/5"		SP	Wet, very dense, brownish gray, fine to medium SAND, little shell (sand size) fragments, trace silt.
			-59.6 65				SP	Wet, very dense, gray, fine to medium SAND, trace silt.
SS	S-18	22/22		52	7 14 38 50/4"		SP	Wet, very dense, brownish gray, fine to medium SAND, little shell (sand size) fragments, trace silt.
			-64.6 70				SP	Wet, very dense, gray, fine SAND, trace silt, shell (sand size) fragments.
SS	S-19	16/16		>50	11 25 50/4"			Wet, very dense, gray, fine SAND, trace silt, shell (sand size) fragments.
			-69.6 75					
SS	S-20	24/18		47	20 24 23			Wet, dense, gray, fine SAND, trace shell (sand size) fragments.
			-74.6 80		20			
SS	S-21	24/24		11	4 5 6 6		SM	Wet, medium dense, gray, fine SAND, little silt, trace shell (sand to gravel size) fragments, gravel.
			-79.6 85					

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-3

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
							SM	
SS	S-22	24/24	-84.6 / 90	6	2, 3, 3, 4			Wet, loose, gray, fine SAND, little silt, trace shell (sand size) fragments.
SS	S-23	24/24	-89.6 / 95	6	3, 3, 3, 3		ML/SM	Wet, medium stiff, gray, SILT and fine SAND, little clay, trace shell (sand size) fragments.
SS	S-24	24/24	-94.6 / 100	9	2, 4, 5, 5		CH	Moist, stiff, dark gray, silty CLAY, trace sand. Pocket Penetrometer Readings: Top= 1.8 tsf, Bottom= 1.0 tsf
								Boring terminated at 100 feet below ground surface.
			-99.6 / 105					
			-104.6 / 110					

BOREHOLE ROANOKE ISLAND.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-4

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 1.48
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 8
Drilling Date: Start: 12-18-09 **End:** 12-18-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 794,964.06 E 2,989,153.44
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			1.5					
			0		2		TS	8-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/23		5	3 2 2		SP-SC	Moist, loose, dark brown, fine SAND, little clay.
SS	S2	24/17		4	2 2 2 2		SP	Moist, very loose to loose, dark brown, fine SAND, trace clay.
SS	S3	24/20	-3.5 5	5	1 2 3 3			Moist, loose, tan and gray, fine SAND, trace clay.
SS	S4	24/24		14	2 6 8 8			Moist, medium dense, tan and gray, fine SAND, trace clay.
SS	S5	24/20		8	2 3 5 5			Wet, loose, gray, fine SAND.
SS	S6	24/18	-8.5 10	7	3 3 4 5			Wet, loose, gray, fine SAND.
SS	S7	24/224		9	3 4 5 7			Wet, loose, gray, fine SAND.
			-13.5		2 2			Wet, loose, gray, fine SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: L.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-4

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/20	-13.5 15	6	4 5		SP	
SS	S9	24/20		4	2 2 2 3			Wet, very loose to loose, gray, fine SAND.
SS	S10	24/18	-18.5 20	6	3 3 3 3			Wet, loose, gray, fine SAND.
SS	S11	24/22	-23.5 25	6	1 2 4 7			Wet, loose, gray, fine to medium SAND.
SS	S12	24/17	-28.5 30	7	3 3 4 7		SW	Wet, loose, gray, fine to coarse SAND.
SS	S13	24/24	-33.5 35	18	4 6 12 20			Wet, medium dense, brown, fine to coarse SAND, trace gravel.
								Boring terminated at 35 feet below ground surface.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-5

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 2.21
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 8
Drilling Date: Start: 12-18-09 **End:** 12-18-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 795,272.90 E 2,988,592.40
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			2.2					
			0					
SS	S1	24/19		4	1 2 2 2		SP	Moist, very loose to loose, brown and gray, fine SAND, trace roots.
SS	S2	24/24		0	WOH WOH WOH 3			Wet, very loose, brown and gray, fine SAND.
SS	S3	24/20	-2.8 5	8	2 3 5 5			Wet, loose, brown and gray, fine SAND.
SS	S4	24/20		6	4 3 3 5			Wet, loose, brown and gray, fine SAND, trace silt.
SS	S5	24/14		5	1 2 3 4			Wet, loose, light brown, fine SAND, trace silt.
			-7.8 10					
SS	S6	24/19		9	3 4 5 5			Wet, loose, light brown, fine SAND.
SS	S7	24/18		11	3 5 6 10			Wet, medium dense, light brown, fine SAND.
			-12.8		4 5			Wet, loose, light brown and gray, fine SAND, trace silt.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I.S.A. 3/19/10 **Date:**

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-5

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/22	-12.8 15	12	7 6		SP	
SS	S9	24/14		4	1 2 2 4			Wet, very loose to loose, brown, fine to medium SAND.
SS	S10	24/14		6	2 3 3 6			Wet, loose, brown to dark brown, fine SAND.
			-17.8 20					
SS	S12	24/15		11	4 5 6 6			Wet, medium dense, gray, fine to coarse SAND, trace gravel, silt.
			-22.8 25					
SS	S13	24/4		11	4 5 6 6			Wet, medium dense, gray, fine to coarse SAND, trace gravel.
			-27.8 30					
SS	S14	24/14		15	5 6 9 8			Wet, medium dense, gray, fine to coarse SAND.
			-32.8 35					Boring terminated at 35 feet below ground surface.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-6

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 5.62
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 9
Drilling Date: Start: 12-18-09 **End:** 12-18-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 795,382.96 E 2,988,560.26
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			5.6					
			0		2		TS	12-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		10	4 6 9		SP	Moist, loose to medium dense, tan, fine SAND.
SS	S2	24/24		18	5 7 11 22			Moist, loose to medium dense, tan, fine SAND.
SS	S3	24/24	0.6 / 5	37	10 20 17 20			Moist, dense, tan and dark brown, fine to medium SAND, trace shell fragments, clay.
SS	S4	24/18		22	10 11 11 11		SP-SC	Moist, medium dense, tan and dark brown, fine to medium SAND, trace clay, gravel.
SS	S5	24/16		10	4 4 6 5			Moist, loose to medium dense, tan and dark brown, fine to medium SAND, little clay, trace gravel.
			-4.4 / 10				SP	Wet, loose to medium dense, brown, fine SAND.
SS	S6	24/20		21	5 7 14 16			Wet, medium dense, brown, fine SAND.
SS	S7	24/20		19	4 8 11 16			Wet, medium dense, brown, fine SAND.
			-9.4		9 10			Wet, medium dense, light brown and gray, fine SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: J.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-6

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-9.4					
SS	S8	24/19	15	25	15 18		SP	
SS	S9	24/17		14	3 5 9 10			Wet, medium dense, light brown, fine SAND.
SS	S10	24/18		17	7 9 8 10			Wet, medium dense, light brown, fine SAND.
			-14.4 20					
SS	S12	24/20		9	5 5 4 8		SW	Wet, loose, dark brown, fine to coarse SAND, trace shell fragments.
			-19.4 25					
SS	S13	24/18		5	2 2 3 4		GP	Wet, loose, brown and white, fine GRAVEL.
			-24.4 30					
SS	S14	24/12		10	3 4 6 5		GP/SP	Wet, loose to medium dense, brown and white, fine GRAVEL and fine SAND.
			-29.4 35					
								Boring terminated at 35 feet below ground surface.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-7

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 3.83
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 40
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 7
Drilling Date: Start: 12-18-09 **End:** 12-18-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 796,023.18 E 2,988,068.09
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			3.8					
			0		1		TS	3-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/16		4	2 2 2		SP	Moist, very loose to loose, orange, brown, and gray, fine SAND.
SS	S2	24/9		5	1 3 2 1		SM	Moist, loose, black and gray, fine SAND, little silt, organic material.
SS	S3	24/21	-1.2 5	7	1 4 3 2		SC	Wet, loose, dark brown, fine to medium SAND, little clay.
SS	S4	24/24		15	5 6 9 10			Wet, medium dense, dark brown, fine to medium SAND, little clay.
							SP	Wet, medium dense, brown, fine SAND.
SS	S5	24/15		9	3 4 5 6			Wet, loose, brown, fine SAND.
			-6.2 10					
SS	S6	24/20		21	6 10 11 12			Wet, medium dense, gray and brown, fine SAND.
SS	S7	24/17		5	1 2 3 5			Wet, loose, gray and brown, fine SAND.
			-11.2		4 10			Wet, medium dense, gray and brown, fine SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-7

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-11.2					
SS	S8	24/20	15	24	14 18		SP	
SS	S9	24/20		19	4 7 12 11			Wet, medium dense, gray and brown, fine SAND.
SS	S10	24/18		9	3 4 5 5			Wet, loose, gray brown, fine SAND. Wet, loose, brown and gray, fine to medium SAND, trace gravel, silt.
			-16.2 20					
SS	S11	24/18		14	4 6 8 9		GP/SP	Wet, medium dense, brown and gray, fine GRAVEL and fine SAND.
			-21.2 25					
SS	S12	24/16		9	3 4 5 5			Wet, loose, brown and gray, fine GRAVEL and fine SAND.
			-26.2 30					
SS	S13	24/18		6	2 3 3 5			Wet, loose, brown and gray, fine GRAVEL and fine SAND.
			-31.2 35					
					1 2		SP	Wet, loose, brown, fine SAND, trace silt.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-7

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S14	24/24		5	3 4		SP	
			-36.2 40					Boring terminated at 40 feet below ground surface.
			-41.2 45					
			-46.2 50					
			-51.2 55					
			-56.2 60					

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-8

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 2.33
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 40
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 6
Drilling Date: Start: 12-18-09 **End:** 12-18-09
Abandonment Method: Grouted to ground surface
Borehole Coordinates:
Field Screening Instrument: None
N 796,224.96 E 2,987,906.32
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			2.3					
			0		2		TS	3-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		10	5 5 6		SP	Moist, loose to medium dense, black and dark brown, fine SAND, trace silt.
SS	S2	24/24		10	4 5 5 5			Moist, medium dense, black, fine SAND, some wood fragments, roots, trace silt.
SS	S3	24/24	-2.7 5	8	2 4 4 3			Moist, loose, dark brown, fine SAND, trace silt. Wet, loose, dark brown, fine SAND, trace silt.
SS	S4	24/24		3	2 1 2 2		SP-SM	Wet, very loose, brown, dark brown, fine SAND, little silt.
SS	S5	24/16		14	3 6 8 10		SP	Wet, medium dense, light brown, fine SAND.
			-7.7 10					
SS	S6	24/24		22	6 10 12 10			Wet, medium dense, light brown, fine SAND.
SS	S7	24/24		15	4 7 8 10			Wet, medium dense, light brown, fine SAND.
			-12.7		2 4			Wet, medium dense, white and light brown, fine SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-8

Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/24	-12.7 15	12	8 10		SP	
SS	S9	24/13		14	3 6 8 8			Wet, medium dense, white and light brown, fine SAND.
SS	S10	24/24		9	3 4 5 7			Wet, medium dense, brown, fine to medium SAND. Wet, loose, brown, fine to medium SAND.
			-17.7 20					
SS	S11	24/16		7	1 3 4 5		SP	Wet, loose, brown, fine to coarse SAND, some gravel, trace silt.
			-22.7 25				GP/SP	Wet, loose, brown and gray, fine GRAVEL and fine SAND.
SS	S12	24/12		3	2 1 2 3			Wet, very loose, brown and gray, fine GRAVEL and fine SAND.
			-27.7 30					
SS	S13	24/18		11	3 4 7 6			Wet, medium dense, brown and gray, fine GRAVEL and fine SAND.
			-32.7 35					
					3 4		SP	Wet, medium dense, gray, medium to coarse SAND.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-8

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S14	24/12		11	7 7		SP	
			-37.7 40					Boring terminated at 40 feet below ground surface.
			-42.7 45					
			-47.7 50					
			-52.7 55					
			-57.7 60					

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-9

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 2.73
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 30
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 2
Drilling Date: Start: 12-17-09 **End:** 12-17-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 796,615.02 E 2,987,518.43
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			2.7					
			0		2		TS	4-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		3	1 2 2		SP-SM	Moist, very loose, dark brown, fine SAND, little silt, trace roots.
SS	S2	24/17		5	2 2 3 4		SP	Wet, loose, light brown, fine SAND, trace clay.
SS	S3	24/21	-2.3 5	7	1 2 5 6			Wet, loose, light brown, fine SAND, trace clay.
SS	S4	24/21		10	5 5 5 5			Wet, loose to medium dense, light brown, fine SAND, trace clay.
SS	S5	24/14		5	2 2 3 3			Wet, loose, white to gray, fine SAND, trace gravel, silt.
SS	S6	24/18	-7.3 10	6	2 3 3 3			Wet, loose, white to gray, fine SAND.
SS	S7	24/16		3	1 2 1 2			Wet, very loose, white to gray, fine SAND.
			-12.3		1 1			Wet, very loose, white to gray and light brown, fine SAND.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-9

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-12.3 15					
SS	S8	24/24		2	1 2		SP	
SS	S9	24/12		3	1 2 1 1		SW	Wet, very loose, brown, fine to coarse SAND.
SS	S10	24/10	-17.3 20	3	1 1 2 3		SP	Wet, very loose, brown, fine to coarse SAND, little gravel.
SS	S11	24/12	-22.3 25	5	1 2 3 4		GP	Wet, loose, brown and white, fine GRAVEL, some medium to coarse sand.
SS	S12	24/20	-27.3 30	24	3 6 18 24		GP SP SP	Wet, medium dense, brown and white, fine GRAVEL, some medium to coarse sand. Wet, medium dense, brown, fine SAND Wet, medium dense, gray, fine SAND, some shell fragments.
			-32.3 35					Boring terminated at 30 feet below ground surface.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-10

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 3.64
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 30
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 4
Drilling Date: Start: 12-17-09 **End:** 12-17-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 796,904.65 E 2,987,299.53
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			3.6					
			0		3		TS	6-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		10	5 5 5		SP	Moist, loose to medium dense, brown, fine SAND.
SS	S2	24/19		5	2 3 2 3			Moist, loose, light brown, fine SAND.
SS	S3	24/24	-1.4 5	7	3 3 4 5			Wet, loose, light brown, fine SAND, trace silt.
SS	S4	24/22		12	5 5 7 8			Wet, medium dense, light brown, fine SAND.
SS	S5	24/18		10	4 5 5 7			Wet, loose to medium dense, light brown, fine SAND.
SS	S6	24/16	-6.4 10	14	5 6 8 7			Wet, medium dense, light brown, fine SAND.
SS	S7	24/24		5	2 3 2 2			Wet, loose, light brown, fine SAND.
			-11.4		1 WOH			Wet, very loose, dark brown, fine to medium SAND, trace gravel, silt.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-10

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/8	-11.4 15	0	WOH WOH		SP	
SS	S9	24/10		1	1 1 WOH WOH		SW	Wet, very loose, brown and white, fine to coarse SAND, little gravel.
SS	S10	24/16	-16.4 20	2	1 1 1 1		SP	Wet, very loose, brown and white, medium to coarse SAND, little gravel.
SS	S11	24/6	-21.4 25	1	1 WOH 1 1			Wet, very loose, brown and white, medium to coarse SAND, little gravel.
SS	S12	24/22	-26.4 30	25	7 12 13 23		SW	Wet, medium dense, fine to coarse SAND, some shell fragments.
			-31.4 35					Boring terminated at 30 feet below ground surface.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-11

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 2.55
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 8
Drilling Date: Start: 12-17-09 **End:** 12-17-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 798,504.41 E 2,984,205.56
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			2.6					
SS	S1	24/19	0	12	4 6 6 2		FILL SP SC	Moist, medium dense, brown, fine to coarse SAND and fine GRAVEL. - FILL- Moist, medium dense, black, fine SAND. Moist, medium dense, brown, fine SAND, little clay.
SS	S2	24/24		10	2 4 6 5			Moist, loose to medium dense, brown, fine SAND, little clay.
SS	S3	24/24	-2.5 5	13	4 6 7 8		SP	Wet, loose to medium dense, brown, fine SAND, trace roots. Wet, medium dense, brown, fine SAND.
SS	S4	24/24		14	4 7 7 8			Wet, medium dense, brown, fine SAND.
SS	S5	24/14		4	2 2 2 1			Wet, very loose to loose, brown, black, and white, fine to medium SAND, trace silt.
SS	S6	24/24	-7.5 10	6	2 3 3 4			Wet, loose, brown, fine to coarse SAND.
SS	S7	24/16		3	1 2 1 4			Wet, very loose, brown, fine to medium SAND, trace silt.
			-12.5		3 4			Wet, loose, brown, fine to coarse SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. **Date:** 3/19/10

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-11

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/24	-12.5 15	9	5 4		SP	
SS	S9	24/19		4	1 2 2 4		SP	Wet, very loose to loose, white and gray, fine to coarse SAND, little to some gravel.
SS	S10	24/18	-17.5 20	4	2 2 2 3		SP	Wet, very loose to loose, gray, fine to medium SAND.
SS	S11	24/19	-22.5 25	56	16 30 26 20		SP	Wet, very dense, gray, medium to coarse SAND, some shell fragments, little gravel.
SS	S12	24/22	-27.5 30	32	14 15 17 20			Wet, dense, gray, medium to coarse SAND, little shell fragments, gravel.
SS	S13	24/24	-32.5 35	34	9 15 19 36		SP	Wet, dense, brown and gray, medium SAND, trace shell fragments, gravel.
								Boring terminated at 35 feet below ground surface.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-12

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 4.06
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 6
Drilling Date: Start: 12-17-09 **End:** 12-17-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 798,589.79 E 2,984,121.24
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			4.1					
			0		1		TS	6-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/20		7	2 5 6		SP	Moist, loose, light brown, fine SAND.
SS	S2	24/16		10	4 4 6 8		SP	Moist, loose to medium dense, light brown, fine SAND.
SS	S3	24/19	-0.9 5	13	4 5 8 8		SC	Moist, loose to medium dense, gray, fine to medium SAND, little to some clay, trace roots, wood fragments.
SS	S4	24/18		2	1 1 1 3		SP	Moist, medium dense, gray and brown, fine SAND.
SS	S5	24/20		7	1 3 4 4		SW	Moist, very loose, gray and brown, fine SAND.
SS	S6	24/24	-5.9 10	7	3 3 4 4		SW	Wet, very loose, brown to dark brown, fine to medium SAND, trace roots.
SS	S7	24/24		1	1 WOH 1 WOH		SP	Wet, loose, dark brown, fine to medium SAND.
			-10.9					Wet, loose, dark brown, fine to medium SAND.
								Wet, very loose, dark brown, fine to coarse SAND, some gravel, trace silt.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I.S.A. **Date:** 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-12

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-10.9 / 15				SP	
SS	S8	24/14	-15.9 / 20	7	2 3 4 4		SP	Wet, loose, light gray, fine to medium SAND, trace silt.
SS	S9	24/24	-20.9 / 25	27	7 12 15 18		SP	Wet, medium dense, gray and light brown, medium to coarse SAND, little shell fragments.
SS	S10	24/21	-25.9 / 30	38	11 19 19 25			Wet, dense, gray and light brown, medium to coarse SAND, little shell fragments.
SS	S11	24/20	-30.9 / 35	35	10 14 21 23			Wet, dense, gray, fine SAND, some shell fragments, trace gravel.
								Boring terminated at 35 feet below ground surface.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-13

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 5.45
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 25
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 3
Drilling Date: Start: 12-17-09 **End:** 12-17-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 800,329.51 E 2,983,255.17
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			5.5					
			0		2		TS	6-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		7	4 3 4		SP	Moist, loose, tan and dark brown, fine SAND, trace silt.
SS	S2	24/24		4	3 2 2 1			Wet, very loose to loose, gray, fine to medium SAND.
SS	S3	24/24	0.5 5	4	2 2 2 4			Wet, very loose to loose, gray to brown, fine to medium SAND.
SS	S4	24/19		13	3 4 9 9			Wet, medium dense, brown, fine to medium SAND.
SS	S5	24/18		2	1 1 1 4			Moist, very loose, black and white, fine to medium SAND, little roots, wood fragments, trace silt.
			-4.6 10					
SS	S6	24/16		9	2 5 4 4			Wet, loose, white, fine SAND.
SS	S7	24/15		4	2 2 2 3			Wet, very loose to loose, white, fine to medium SAND. Wet, very loose to loose, white, fine to medium SAND, trace gravel.
			-9.6		2 4			Wet, loose, fine to coarse SAND, trace gravel.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I.S.A. **Date:** 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-13

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-9.6 15					
SS	S8	24/16		7	3 4		SP	
SS	S9	24/21		4	2 2 2 2		SP	Wet, very loose to loose, dark brown, fine to coarse SAND, little gravel, trace clay.
SS	S10	24/12		2	1 1 1 WOH			Wet, very loose, white to gray, fine to coarse SAND, little gravel, trace clay.
			-14.6 20					
SS	S11	24/21		50	7 18 32 24		SP	Wet, dense to very dense, gray, fine SAND, little shell fragments, trace silt.
			-19.6 25					
								Boring terminated at 25 feet below ground surface.
			-24.6 30					
			-29.6 35					

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-14

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 4.87
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 30
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 5
Drilling Date: Start: 12-17-09 **End:** 12-17-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 800,595.72 E 2,982,897.55
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			4.9					
			0		2		TS	3-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		4	2 2 1		SM	Moist, very loose to loose, dark brown and black, fine SAND, some silt.
SS	S2	24/19		3	1 2 1 1			Moist, very loose, brownish gray, fine to medium SAND, some silt, little clay.
SS	S3	24/21	-0.1 5	6	2 3 3 3			Moist, loose, brown and gray, fine SAND, some silt, little clay.
							SP	Wet, loose, dark brown, fine SAND.
SS	S4	24/24		13	3 6 7 8			Wet, medium dense, dark to light brown, fine SAND.
SS	S5	24/17		5	2 2 3 4			Wet, loose, light brown, fine to medium SAND, trace silt, roots.
SS	S6	24/19	-5.1 10	8	3 4 4 4			Wet, loose, light brown and gray, fine to medium SAND, trace silt.
SS	S7	24/18		6	3 3 3 3			Wet, loose, brown and gray, fine to medium SAND.
			-10.1		2 2			Wet, loose, brown and gray, fine to medium SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I.S.A. 3/19/10 **Date:**

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-14

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-10.1 15					
SS	S8	24/24		5	3 2		SP	
							SW/GP	Wet, very loose, brown, fine to coarse SAND and fine GRAVEL.
SS	S9	24/18	-15.1 20	2	1 WOH 2 WOH		SP	Wet, very loose, brown, fine to coarse SAND and fine GRAVEL. Wet, very loose, gray, fine SAND.
SS	S10	24/18	-20.1 25	3	1 1 2 2			Wet, very loose, gray, fine SAND.
SS	S11	24/18	-25.1 30	10	2 3 7 10		SP/GP	Wet, loose to medium dense, gray, fine SAND. Wet, loose to medium dense, gray, fine SAND and SHELL FRAGMENTS.
			-30.1 35					Boring terminated at 30 feet below ground surface.

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-15

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 7.04
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 25
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 5
Drilling Date: Start: 12-16-09 **End:** 12-16-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 801,499.26 E 2,982,298.13
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			7.0					
			0		2		TS	6-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		3	2 1 3		SP	Moist, very loose, black and brown, fine SAND, trace silt.
SS	S2	24/19		4	2 2 2 3		SC	Moist, very loose to loose, brown and gray, fine to medium SAND, little clay.
					4		SP/PT	Moist, medium dense, black, fine to medium SAND and ORGANIC MATERIAL.
SS	S3	24/24	2.0 5	11	5 6 6		SP	Wet, medium dense, gray and brown, fine SAND.
SS	S4	24/16		10	4 5 5 4			Wet, loose to medium dense, gray and brown, fine SAND.
SS	S5	24/18		11	4 5 6 4			Wet, medium dense, white and gray, fine SAND.
SS	S6	24/21	-3.0 10	10	4 4 6 6			Wet, loose to medium dense, white and gray, fine SAND.
SS	S7	24/17	-8.0	6	1 3 3 3			Wet, loose, brown, fine to medium SAND.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
- HSA - Hollow Stem Auger
- SSA - Solid Stem Auger
- HA - Hand Auger
- AR - Air Rotary
- DTR - Dual Tube Rotary
- FR - Foam Rotary
- MR - Mud Rotary
- RC - Reverse Circulation
- CT - Cable Tool
- JET - Jetting
- D - Driving
- DTC - Drill Through Casing

SAMPLING TYPES:
- AS - Auger/Grab Sample
- CS - California Sampler
- BX - 1.5" Rock Core
- NX - 2.1" Rock Core
- GP - Geoprobe
- HP - Hydro Punch
- SS - Split Spoon
- ST - Shelby Tube
- WS - Wash Sample

OTHER:
- AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

Reviewed by: I.S.A. 3/19/10 **Date:**

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-15

Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			-8.0 / 15				SP	
SS	S8	24/18	-13.0 / 20	8	2 3 5 5		SW	Wet, loose, brown and gray, fine to coarse SAND, little gravel.
SS	S9	24/14	-18.0 / 25	20	2 7 13 18		SP	Wet, medium dense, fine SAND, trace shell fragments.
			-23.0 / 30					Boring terminated at 25 feet below ground surface.
			-28.0 / 35					

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-16

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 2.72
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 5
Drilling Date: Start: 12-16-09 **End:** 12-16-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 801,578.93 E 2,978,372.38
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			2.7					
			0		1		TS	3-inch-thick grass, roots, and sandy TOPSOIL.
SS	S1	24/24		6	2 4 7		FILL	Moist, loose, brown, fine to medium SAND, trace gravel. **-FILL-**
SS	S2	24/18		15	4 7 8 9		SP	Moist, medium dense, gray, fine SAND.
SS	S3	24/18	-2.3 5	21	5 9 12 11		SC	Moist, medium dense, gray, fine SAND. Wet, medium dense, light gray, fine SAND, little clay.
SS	S4	24/17		15	6 7 8 10		SP	Wet, medium dense, gray, medium SAND.
SS	S5	24/18		17	3 6 11 15			Wet, medium dense, grayish brown, medium SAND.
SS	S6	24/24	-7.3 10	26	6 13 13 13			Wet, medium dense, grayish brown, medium SAND.
SS	S7	24/20		13	5 6 7 9		SW	Wet, medium dense, brown, fine to coarse SAND, trace gravel.
			-12.3		1 WOH			Wet, very loose, brown, fine to coarse SAND, trace gravel.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I.S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-16

Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/22	-12.3 15	2	2 1		SW	
SS	S9	24/12		4	1 2 2 2		SW GP/SW	Wet, very loose to loose, brown, fine to coarse SAND, little gravel. Wet, very loose to loose, brown and white, fine GRAVEL and fine to coarse SAND.
SS	S10	24/13	-17.3 20	4	1 2 2 4		SP	Wet, very loose to loose, dark brown, fine SAND, trace silt.
SS	S11	24/12	-22.3 25	12	3 5 7 8			Wet, medium dense, grayish brown, fine SAND.
SS	S12	24/16	-27.3 30	31	10 14 17 15		SP	Wet, dense, gray, fine to medium SAND, little shell fragments.
SS	S13	24/18	-32.3 35	41	15 20 21 23			Wet, dense, gray, fine to medium SAND, some shell fragments.
								Boring terminated at 35 feet below ground surface.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-17

Client: Dare County
Project Name: Roanoke Island Water System Improvements
Project Location: Roanoke Island, NC
Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.
Surface Elevation (ft.): 3.01
Drilling Method/Rig: Mud Rotary/CME-35
Total Depth (ft.): 35
Drillers: Dave Wikoff
Depth to Initial Water Level (ft. BGS): 4
Drilling Date: Start: 12-16-09 **End:** 12-16-09
Abandonment Method: Backfilled with Bentonite Pellets
Borehole Coordinates:
Field Screening Instrument: None
N 801,277.20 E 2,978,446.34
Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
			3.0					
SS	S1	24/24	0	7	2 2 5 5		FILL	Moist, loose, brown and gray, fine to medium SAND. **-FILL-**
SS	S2	24/20		7	3 4 3 3			Moist, loose, brown and gray, fine to medium SAND.
SS	S3	24/24	-2.0 5	13	2 5 8 11		SP	Wet, loose, black and white, fine SAND, trace silt.
SS	S4	24/20		17	2 5 12 13			Wet, medium dense, brown and dark brown, fine SAND, little roots, trace silt.
SS	S5	24/20	-7.0 10	11	3 5 6 7			Wet, medium dense, brown, fine SAND.
SS	S6	24/21		21	7 10 11 12			Wet, medium dense, brown, fine SAND.
SS	S7	24/24		16	4 6 10 9			Wet, medium dense, brown, fine SAND.
			-12.0		2 1			Wet, very loose, gray and brown, fine to medium SAND.

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
DTR - Dual Tube Rotary
FR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving
DTC - Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
OTHER:
AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: I. S.A. 3/19/10 **Date:**

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 3/19/10

CAMP DRESSER & McKEE

CDM

BOREHOLE LOG
B-17

Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S8	24/18	-12.0 15	3	2 2		SP	Wet, very loose, gray and brown, fine to medium SAND.
SS	S9	24/24		2	1 1 1 WOH		SW	Wet, very loose, dark brown, fine to coarse SAND, trace gravel.
SS	S10	24/19	-17.0 20	3	1 2 1 4		SW	Wet, very loose, dark brown, fine to coarse SAND, some gravel.
SS	S11	24/16	-22.0 25	8	3 3 5 5		SP	Wet, loose, gray, fine SAND.
SS	S12	24/10	-27.0 30	3	1 2 1 2			Wet, very loose, gray, fine to medium SAND.
SS	S13	24/18	-32.0 35	42	10 20 22 21		SP	Wet, dense, gray, fine SAND. Wet, dense, gray, fine SAND, some shell fragments.
								Boring terminated at 35 feet below ground surface.

BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDT 4/13/10

Phase 3

GET Solutions, Inc.

Geotechnical • Environmental • Drilling

BORING LOG
B-18

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: US-64 at Etheridge
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 7' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2/19/10
CAVING> ℄ ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			8 inches of TOPSOIL							
			0.7							
			Tan-Gray, moist, poorly graded fine to medium SAND (SP), loose		1	18	SS	3 3 4 5	7	
			3							
			Light Gray, moist, Silty fine SAND (SM) with trace clay, loose		2	16	SS	3 3 2 3	5	
		5	5							
			Tan, moist to wet, poorly graded fine to medium SAND (SP), loose to medium dense		3	16	SS	3 3 5 5	8	
	2		Wet from 7 feet ▽		4	14	SS	3 3 4 3	7	0.5
					5	12	SS	3 3 4 5	7	
		10			6	18	SS	3 5 5 7	10	
	4				7	14	SS	6 7 9 11	16	
		15			8	14	SS	7 11 13 15	24	
	6	20			9	14	SS	6 7 7 11	14	
			Light Gray from 23 feet		10	16	SS	6 9 16 21	25	
		25								
	8		Boring terminated at 25 ft.							
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc
Geotechnical • Environmental • Testing

BORING LOG B-19

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: US-64 at Airport
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 7' **AFTER 24 HOURS:** ▼ ___
PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2/19/10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7' Gray-Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, loose to medium dense		1	18	SS	2 2 3 5	5	
			Tan from 2.5 feet		2	20	SS	5 5 4 3	9	
		5			3	16	SS	3 3 3 4	6	0.8
	2		▽ Wet from 7 feet		4	18	SS	3 3 4 4	7	
					5	14	SS	3 3 6 6	9	
		10			6	17	SS	5 8 7 6	15	
	4				7	17	SS	3 5 7 7	12	
		15			8	20	SS	5 6 6 5	12	
	6				9	14	SS	3 5 9 11	14	
		20								
			Light Gray from 23 feet		10	12	SS	7 11 14 15	25	
		25								
	8		Boring terminated at 25 ft.							
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical • Environmental • Coastal

BORING LOG
B-20

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Brakewood
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2-19-10
DEPTH TO WATER - INITIAL*: ▽ 6.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			8 inches of TOPSOIL							
			0.7 Gray-Brown, moist, Silty fine SAND (SM) with trace Organics, loose		1	16	SS	2 4 4 4	8	
			2 Light Tan-Tan, moist, Silty fine SAND (SM), very loose		2	20	SS	3 2 2 3	4	
			4							
		5	Light Tan-Tan, moist to wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to coarse SAND (SP-SM) with silt, very loose to medium dense		3	16	SS	3 3 3 4	6	2.1
	2		▽ Wet from 6.5 feet		4	24	SS	3 5 7 7	12	
			Light Gray-Tan from 8 feet		5	12	SS	3 5 6 5	11	
		10			6	18	SS	5 5 6 6	11	
	4				7	13	SS	3 3 4 4	7	
		15			8	16	SS	3 4 4 3	8	
			Tan from 18 feet		9	12	SS	1 1 2 2	3	
	6	20								
			Brown from 23 feet		10	14	SS	1 2 2 1	4	
		25								
	8		Boring terminated at 25 ft.							
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical • Environmental • Coastal

BORING LOG B-21

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Amanda
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2/25/10
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			7 inches of TOPSOIL (0.6)		1	24	SS	2 3 3 2	6	
			Gray, moist, Silty fine SAND (SM) with clay and trace organics, loose (3)		2	20	SS	2 2 7 6	9	
			Gray, moist, Silty fine SAND (SM), loose (4)							
		5	Gray-Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, very loose to loose		3	22	SS	3 4 4 4	8	
	2		Tan from 6 feet		4	24	SS	3 1 3 4	4	1.1
		10			5	12	SS	1 1 2 2	3	
					6	16	SS	1 3 2 3	5	
	4				7	14	SS	2 2 3 4	5	
		15			8	14	SS	3 3 5 4	8	
					9	11	SS	4 5 5 6	10	
	6	20								
					10	12	SS	3 3 3 3	6	
		25	Boring terminated at 25 ft.							
	8									
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

BORING LOG B-22

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Stream at Battlefield
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2-19-10
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL		1	24	SS	3 4 6 5	10	
			0.7 Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), with trace organics, loose to medium dense		2	17	SS	8 5 8 7	13	
		5	4 Gray-Tan, wet, poorly graded fine to medium SAND (SP-SM), loose		3	24	SS	3 3 3 4	6	9.7
	2		6 Tan, wet, poorly graded fine to coarse SAND (SP), loose		4	24	SS	3 4 5 5	9	
		10			5	12	SS	2 3 3 4	6	0.5
	4				6	16	SS	3 4 3 4	7	
		15			7	14	SS	3 3 4 4	7	
					8	16	SS	1 3 4 6	7	
	6		16 Tan, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), very loose to medium dense		9	13	SS	5 5 6 6	11	
		20	Light Gray from 18 feet		10	12	SS	4 5 6 7	11	
			Reddish Tan from 23 feet		11	12	SS	3 1 3 5	4	
	8	25								
			28 Tan, wet, poorly graded fine to coarse SAND (SP) with Marine Shell Fragments, dense		12	16	SS	18 26 19 19	45	
		30	Boring terminated at 30 ft.							
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

*The initial groundwater reading may not be indicative of the static groundwater level.

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical • Environmental • Drilling

BORING LOG B-23

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Stream at Battlefield
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___
PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2-19-10
CAVING> ℄ ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	7 inches of TOPSOIL							
			0.6 Dark Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), with trace organics, medium dense		1	16	SS	4 5 6 5	11	
			2 Tan-Gray, moist to wet, Silty fine SAND (SM) with clay to Clayey fine SAND (SC) with silt, loose to medium dense		2	24	SS	7 6 5 3	11	
		5	Wet from 4 feet		3	10	SS	3 4 5 4	9	
	2		6 Tan-Gray, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, loose		4	24	SS	3 2 3 4	5	1.3
					5	12	SS	2 3 4 3	7	
		10	Tan from 10 feet		6	20	SS	2 3 4 3	7	
	4				7	16	SS	3 5 4 5	9	
		15	Tan-Gray from 14 feet		8	12	SS	4 4 5 6	9	
					9	14	SS	3 4 4 4	8	
			18 Gray-Tan, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), medium dense		10	12	SS	5 6 6 8	12	
	6	20								
			23 Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, with Marine Shell Fragments, medium dense to very dense		11	14	SS	9 12 17 17	29	
		25								
	8									
					12	16	SS	16 26 25 18	51	
		30	Boring terminated at 30 ft.							
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

BORING LOG B-24

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: HWY-345 at Water Plant
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___
PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2-23-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			7 inches of TOPSOIL							
			0.6							
			Gray-Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, very loose to loose		1	24	SS	2 2 3 3	5	
			▽ 3		2	16	SS	2 1 2 2	3	31.2
			Tan, wet, Silty fine to medium SAND (SM) with clay to Clayey fine to medium SAND (SC) with silt, loose							
		5	5		3	24	SS	2 4 4 4	8	1.5
	2		Tan, wet, poorly graded fine to medium SAND (SP), loose to medium dense		4	24	SS	4 3 3 4	6	
			Brown from 7 feet							
			Tan from 8 feet		5	14	SS	1 2 3 4	5	
		10			6	18	SS	4 5 6 5	11	
	4				7	12	SS	4 5 5 6	10	
		15			8	24	SS	4 6 8 7	14	
			Gray-Tan from 18 feet		9	12	SS	3 4 4 5	8	
	6	20			10	14	SS	3 3 5 4	8	
		25								
	8		Boring terminated at 25 ft.							
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

BORING LOG B-25

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: HWY-345 at Baumtown
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___
PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2-24-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			6 inches of TOPSOIL		1	12	SS	2 3 5 5	8	
			0.5 Tan, moist, poorly graded fine to medium SAND (SP) with large root fragments, loose							
			3		2	24	SS	4 5 3 2	8	
		5	Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), loose to medium dense Tan from 4 feet Wet from 4 feet		3	24	SS	2 3 4 5	7	5.7
	2				4	24	SS	4 6 9 9	15	
			8							
		10	Gray-Tan, wet, poorly graded fine to coarse SAND (SP), loose to medium dense		5	24	SS	4 5 7 7	12	
			Tan from 11 feet		6	20	SS	6 7 9 10	16	
	4				7	14	SS	5 7 9 9	16	
		15			8	24	SS	4 4 3 2	7	
			With fine Gravel from 18 feet		9	8	SS	2 5 6 7	11	
	6	20								
					10	10	SS	3 4 6 5	10	
		25	Boring terminated at 25 ft.							
	8									
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

BORING LOG B-26

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Stream at Baumtown
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2-23-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt; (Possible Fill), loose		1	18	SS	2 5 5 4	10	
			2.5 Black, moist to wet, Silty, Clayey PEAT (PT), very soft to soft		2	20	SS	2 2 1 1	3	
			Wet from 4 feet		3	10	SS	1 1 1 0	2	
	2	5			4	1	SS	WOH WOH WOH WOH	0	
					5	7	SS	WOH WOH WOH WOH	0	
		10	10 Reddish Brown, wet, poorly graded fine to medium SAND (SP-SM), loose to medium dense		6	24	SS	1 3 3 3	6	9.0
	4				7	18	SS	6 7 8 6	15	
		15			8	20	SS	3 3 3 2	6	
			15.5 Black, wet, Silty, Clayey PEAT (PT), very soft		9	24	SS	1 1 1 1	2	
			17.5 Gray, wet, Sandy Fat CLAY (CH), very soft		10	12	SS	1 1 1 1	2	
	6	20	19 Dark Gray, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) with trace organics, very loose		11	12	SS	1 1 2 3	3	
		25	24 Gray, wet, poorly graded fine to coarse SAND (SP), very loose to loose							
	8				12	16	SS	4 5 5 3	10	
			With Marine Shell Fragments from 29 feet							
		30								
	10				13	7	SS	1 1 1 1	2	
		35	34.5 Dark Gray, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to coarse SAND (SP-SM) with silt, with fine Gravel, very loose					2 2		

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical · Environmental · Coastal

BORING LOG
B-26

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Stream at Baumtown
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2-23-10
DEPTH TO WATER - INITIAL*: ▼ 4' **AFTER 24 HOURS:** ▼ ___
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	12	40			14	2	SS	1 1	3	
			Boring terminated at 40 ft.							
	14	45								
		50								
	16									
		55								
	18									
		60								
	20	65								
		70								
	22									
		75								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical · Environmental · Coastal

BORING LOG B-27

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Stream at Baumtown
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2-23-10
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			7 inches of TOPSOIL							
			0.6							
			Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM); (Possible Fill), very loose		1	24	SS	2 2 2 3	4	
			3							
			Dark Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with organics to Silty fine to medium SAND (SM) with organics , very loose		2	16	SS	2 1 1 2	2	
	2	5	Wet from 4 feet Organic Content = 3.7% Dark Brown from 6 feet		3	7	SS	3 1 1 3	2	5.4
					4	24	SS	2 2 2 4	4	
			9							
		10	Tan, wet, poorly graded fine to medium SAND (SP), loose		5	14	SS	5 3 3 2	6	
			11							
			Gray, wet, Fat CLAY (CH), very soft		6	24	SS	1 1 1 1	2	95.0
	4		13							
			Gray, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to coarse SAND (SP-SM) with silt, very loose to medium dense		7	16	SS	3 3 3 4	6	
		15			8	14	SS	3 3 2 1	5	
					9	12	SS	1 0 1 0	1	
					10	6	SS	1 1 1 1	2	
	6	20								
			With fine Gravel and Marine Shell Fragments from 23 feet		11	20	SS	5 4 8 5	12	
		25								
	8									
					12	24	SS	4 5 5 6	10	
		30								
			Boring terminated at 30 ft.							
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical • Environmental • Coastal

BORING LOG B-28

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: HWY-345 at Old Wharf
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Mud Rotary (Wash)
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 2-24-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			6 inches of TOPSOIL							
			0.5							
			Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), loose to medium dense		1	24	SS	2 5 6 4	11	
			Wet from 3 feet		2	16	SS	3 3 4 2	7	
			3.5							
		5	Dark Gray, wet, Silty fine SAND (SM) with clay and trace organics, very loose		3	20	SS	1 1 2 1	3	13.2
	2		6							
			Light Gray-Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, very loose to loose		4	16	SS	1 1 2 3	3	
			Tan from 8 feet		5	16	SS	3 4 5 6	9	
		10			6	16	SS	4 4 3 3	7	
	4				7	16	SS	3 3 3 4	6	
		15			8	16	SS	3 3 3 3	6	
	6		Tan-Gray from 19.5 feet		9	14	SS	1 3 3 2	6	
		20								
			23							
			Gray, wet, Clayey fine SAND (SC) with silt, loose		10	24	SS	2 3 4 2	7	
		25	Boring terminated at 25 ft.							
	8									
		30								
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

Geotechnical • Environmental • Drilling

BORING LOG B-29

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Stream at Thicket Lump
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2-22-10
DEPTH TO WATER - INITIAL*: ▼ 2' **AFTER 24 HOURS:** ▼ ___
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Gray-Tan, moist to wet, Silty fine SAND (SM), very loose		1	12	SS	1 0 2 3	2	
			Wet from 2 feet							
			3 Brown, wet, Clayey fine SAND (SC) with silt, with trace organics, very loose		2	24	SS	1 1 1 1	2	32.5
		5	4 Tan-Gray, wet, Silty fine SAND (SM), loose		3	24	SS	2 2 4 4	6	
	2		6 Tan, wet, poorly graded fine to coarse SAND (SP), loose to medium dense		4	24	SS	2 6 9 9	15	
					5	12	SS	4 4 4 4	8	
		10			6	24	SS	2 3 2 1	5	
	4				7	14	SS	4 4 4 5	8	
		15	Gray from 14 feet		8	24	SS	4 4 5 5	9	
			Tan from 16 feet		9	14	SS	5 4 3 3	7	
	6	20			10	10	SS	2 2 3 3	5	
			23 Gray, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), medium dense		11	24	SS	2 6 9 18	15	
		25								
	8									
			29 Light Gray, wet, poorly graded fine to medium SAND (SP), very dense		12	16	SS	22 33 42 53	75	
		30	Boring terminated at 30 ft.							
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

GET Solutions, Inc.

BORING LOG B-30

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Stream at Thicket Lump
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)
DATE: 2-22-10
DEPTH TO WATER - INITIAL*: ▽ 1' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			6 inches of TOPSOIL		1	16	SS	1 0 1 0	1	8.3
			0.5 Gray-Tan, moist to wet, poorly graded fine to medium SAND (SP-SM), very loose Wet from 1 foot		2	18	SS	WOH WOH WOH 1	0	
			3.5 Dark Gray-Brown, wet, Silty fine SAND (SM) with clay and organics, loose		3	24	SS	2 2 3 4	5	
	2	5	6 Tan, wet, poorly graded fine to medium SAND (SP-SM) to Silty fine SAND (SM), loose		4	24	SS	3 4 4 5	8	
			8 Gray-Brown, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, loose		5	16	SS	3 4 5 5	9	
		10			6	22	SS	3 5 5 7	10	
	4		13 Gray, wet, Sandy Fat CLAY (CH), soft		7	18	SS	2 1 2 3	3	
		15	15 Light Gray, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, very loose to medium dense Gray from 17.5 feet		8	16	SS	4 6 8 7	14	
					9	12	SS	2 3 3 4	6	
	6	20	Dark Gray from 19 feet		10	12	SS	2 2 1 5	3	
					11	10	SS	2 3 2 3	5	
		25	24.5 Gray, wet, Clayey fine SAND (SC) with silt, loose							
	8		29 Tan, wet, poorly graded fine to medium SAND (SP), medium dense		12	14	SS	4 6 6 9	12	
		30	Boring terminated at 30 ft.							
	10									
		35								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Topsoil
	Poorly graded Sand
	Silty Sand
	Poorly graded Sand with Silt
	Silty Sand with organics
	Clayey Sand
	Poorly Graded Sand with Organics
	Peat
	Fat Clay
Misc. Symbols	
	Water table during drilling

Notes:

1. Exploratory borings were drilled on 2-22-10 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

Appendix B

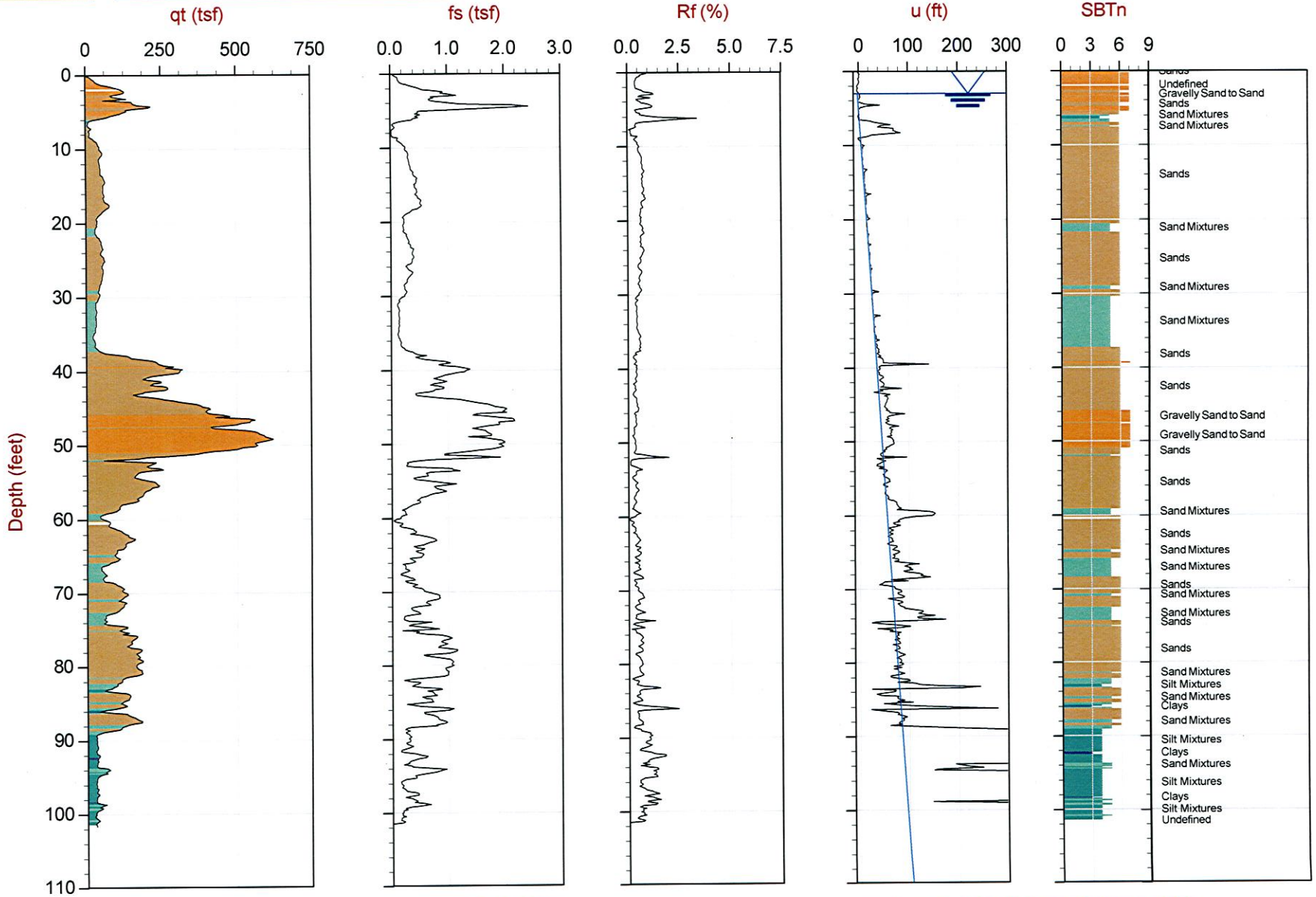
CPT Soundings

CONETEC

GET Solutions

Job No: 09-960
Date: 09:23:09 14:33
Site: Wanchese NC

Sounding: CPT-1
Cone: 195:T1500F15U500



Max Depth: 31.000 m / 101.70 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 960CP03.COR
Unit Wt: SBT Chart Soil Zones

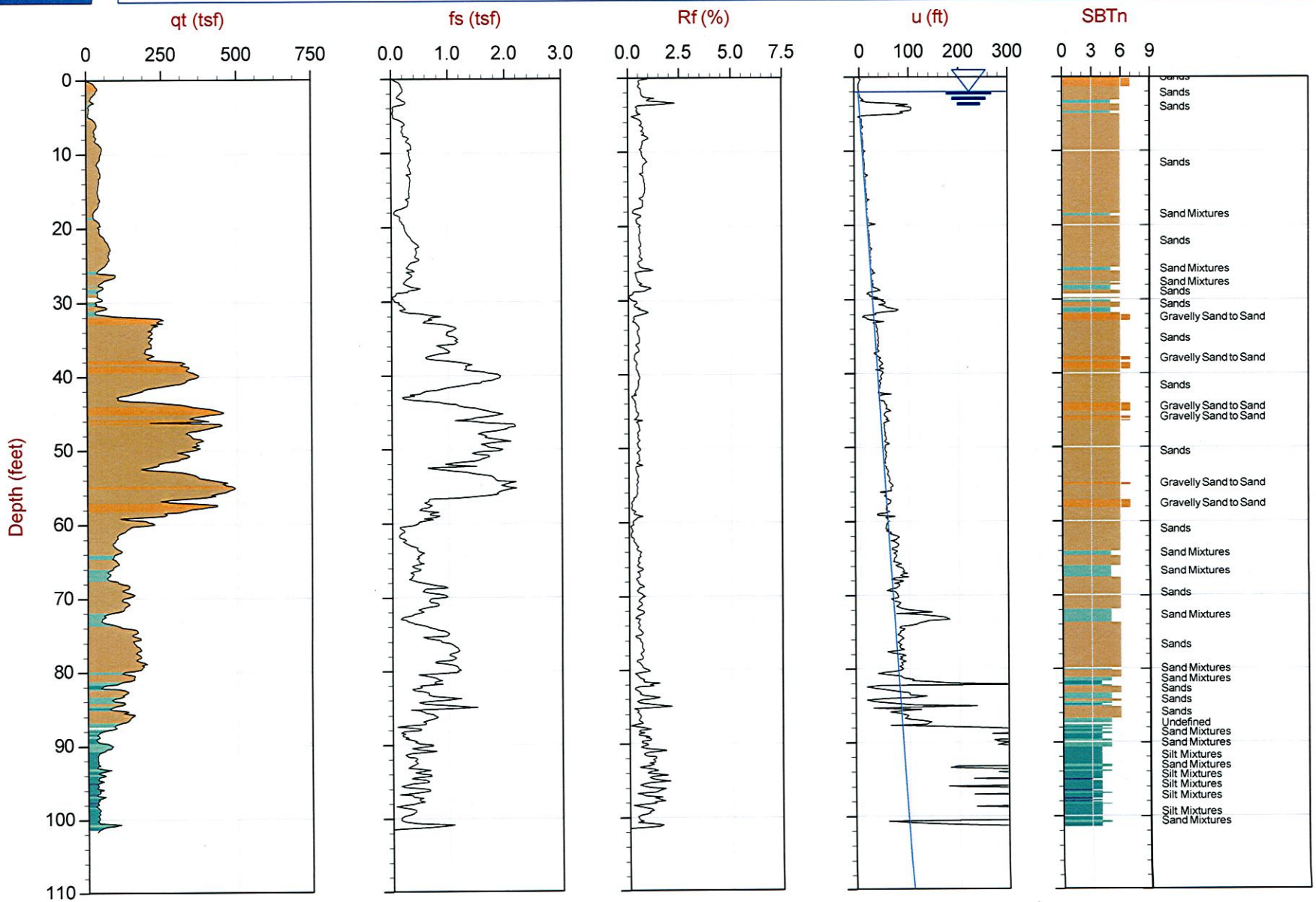
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1

CONETEC

GET Solutions

Job No: 09-960
Date: 09:23:09 13:44
Site: Wanchese NC

Sounding: CPT-2
Cone: 195:T1500F15U500



Max Depth: 31.000 m / 101.70 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 960CP02.COR
Unit Wt: SBT Chart Soil Zones

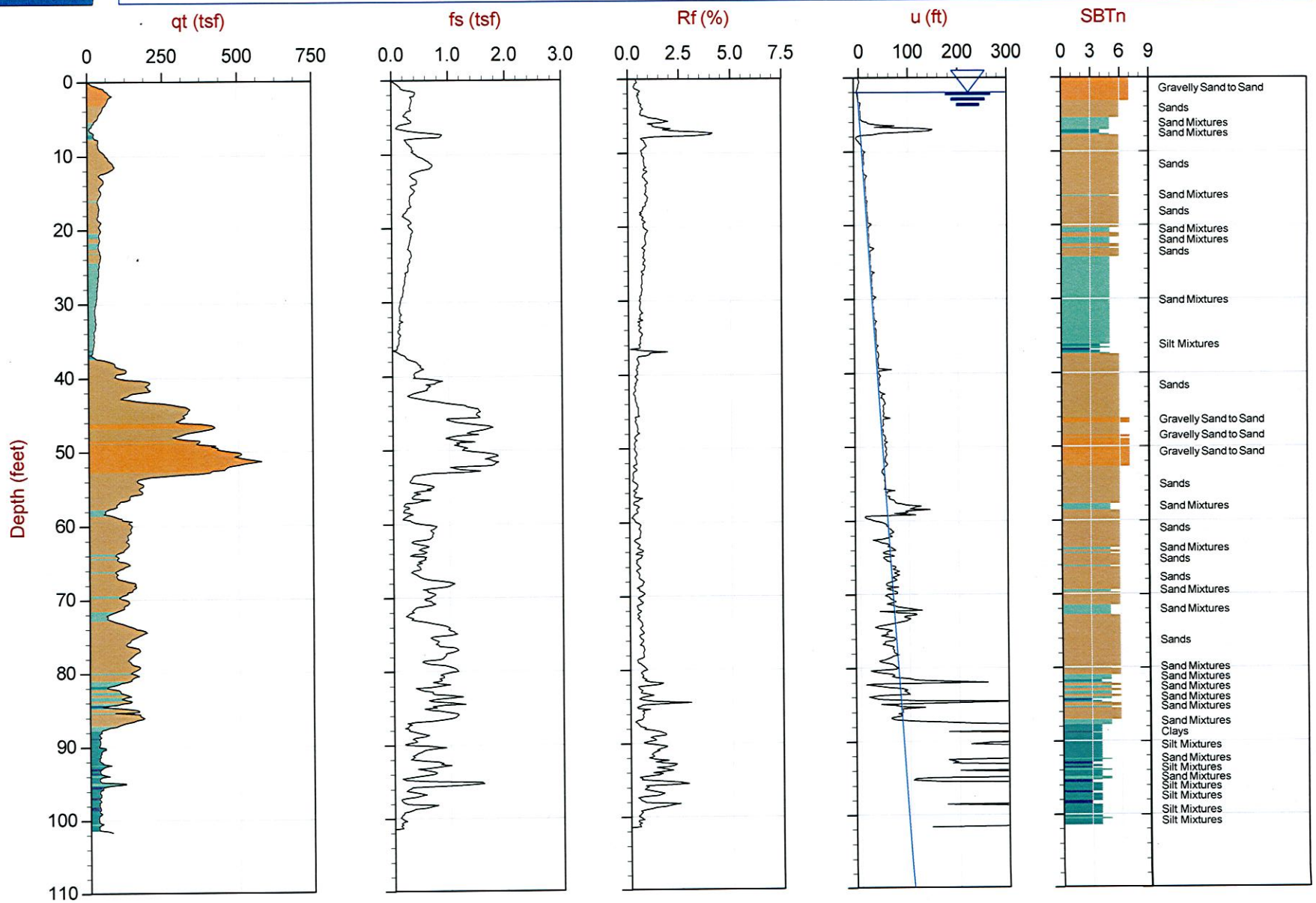
SBT: Lunne, Robertson and Powell, 1997

CONETEC

GET Solutions

Job No: 09-960
Date: 09:23:09 12:17
Site: Wanchese NC

Sounding: CPT-3
Cone: 195:T1500F15U500



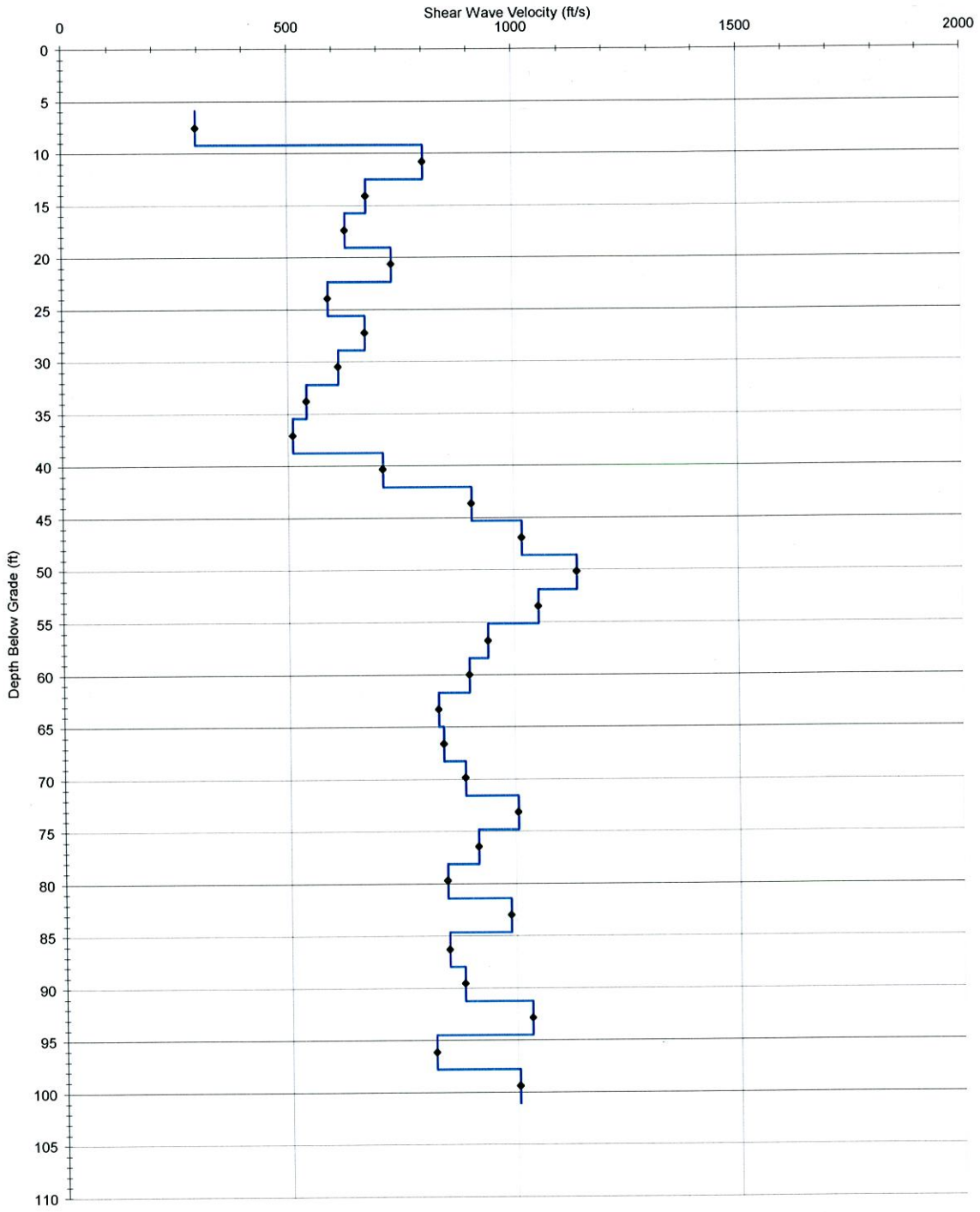
Max Depth: 31.000 m / 101.70 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

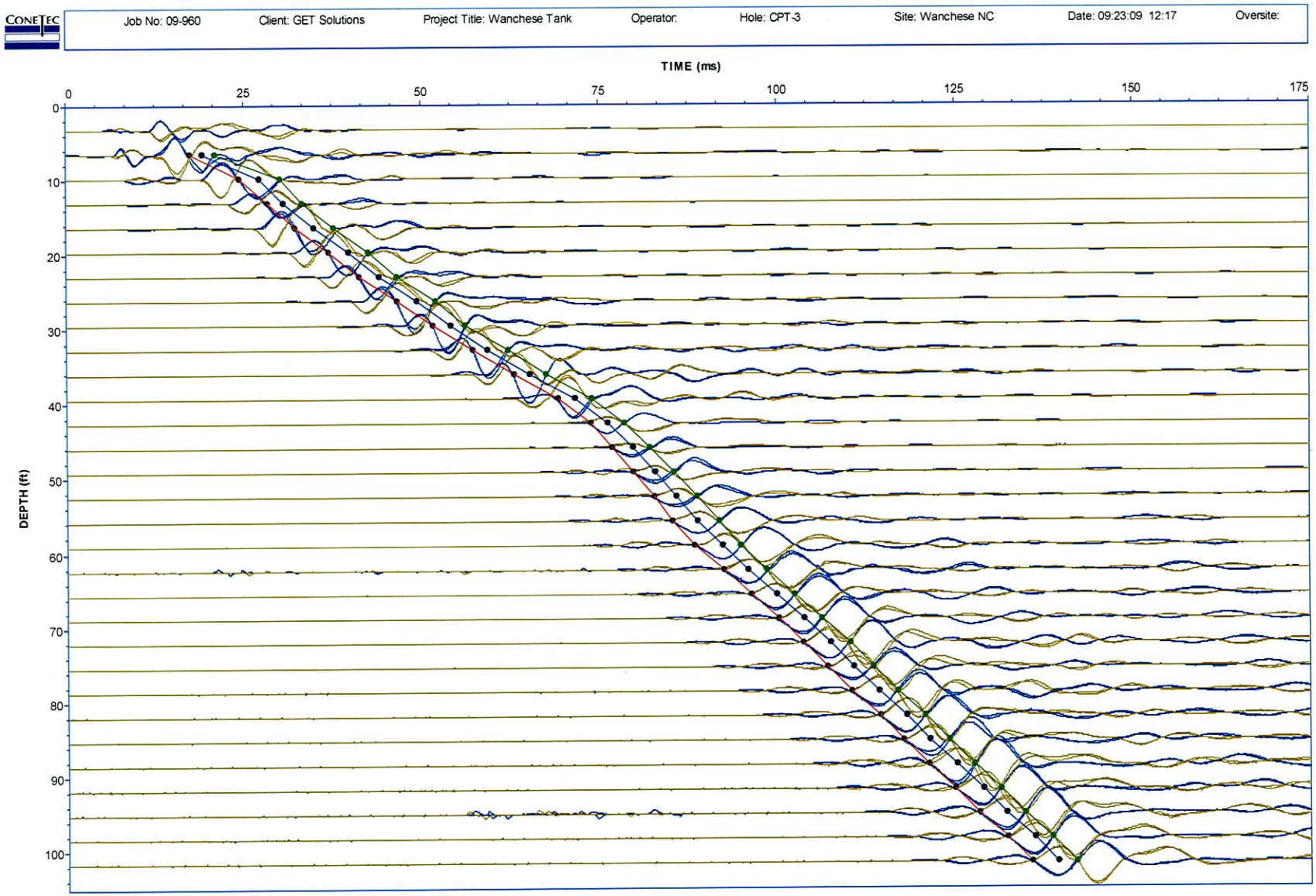
File: 960CP01.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997

CONETEC

Shear Wave Velocity- CPT-3
Wanchese Tank
09-960
September 23, 2009



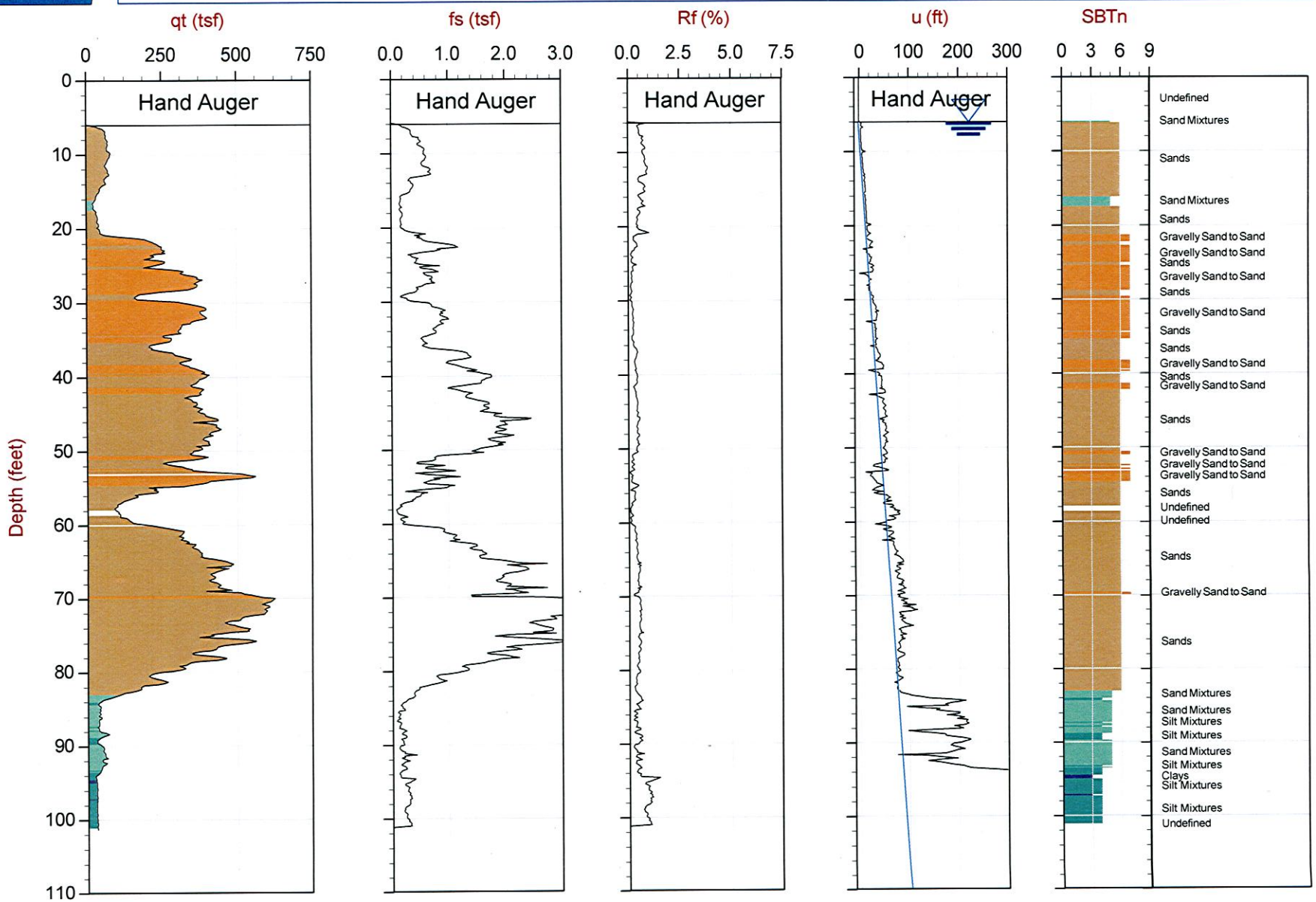

CONETEC
Job No: 09-960
Client: GET Solutions
Project Title: Wanchese Tank
Operator:
Hole: CPT-3
Site: Wanchese NC
Date: 09:23:09 12:17
Oversite:
TIME (ms)
0
25
50
75
100
125
150
175
DEPTH (ft)
0
10
20
30
40
50
60
70
80
90
100

CONETEC

GET Solutions

Job No: 09-960
Date: 09:23:09 16:59
Site: Manteo NC

Sounding: CPT-4
Cone: 195:T1500F15U500



Max Depth: 30.900 m / 101.38 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 960CP04.COR
Unit Wt: SBT Chart Soil Zones

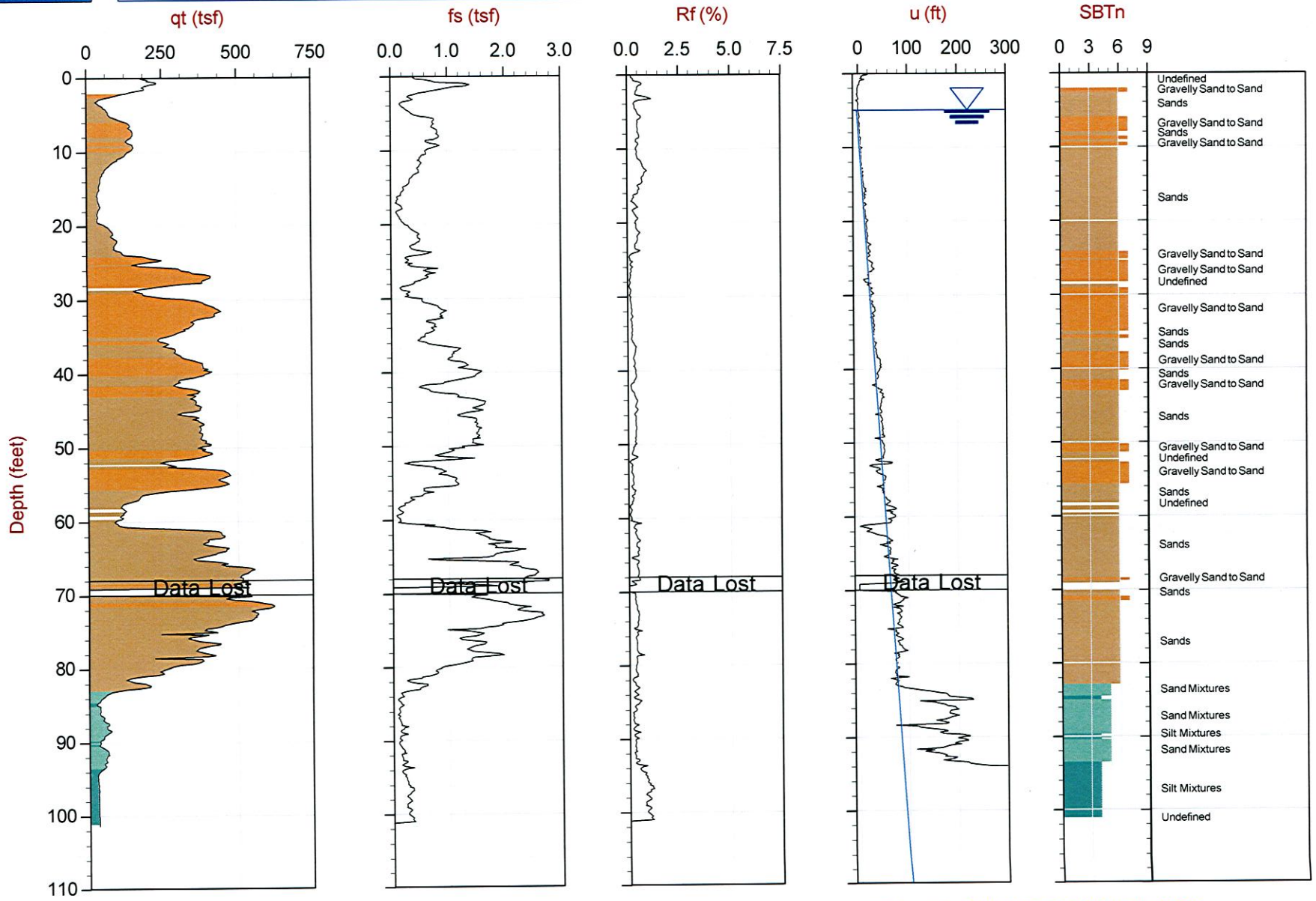
SBT: Lunne, Robertson and Powell, 1997

CONETEC

GET Solutions

Job No: 09-960
Date: 09:23:09 18:28
Site: Manteo NC

Sounding: CPT-5
Cone: 195:T1500F15U500



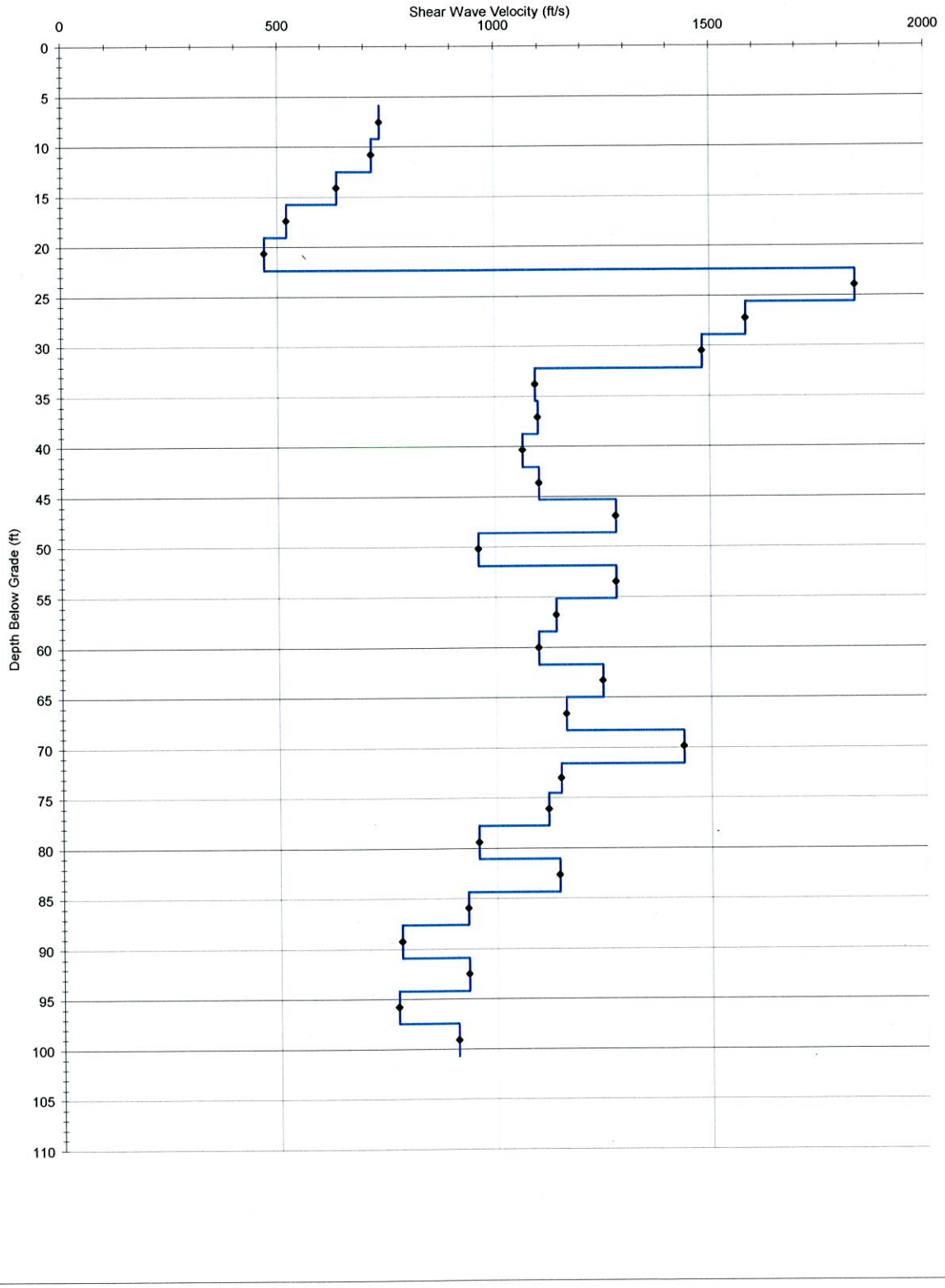
Max Depth: 30.900 m / 101.38 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

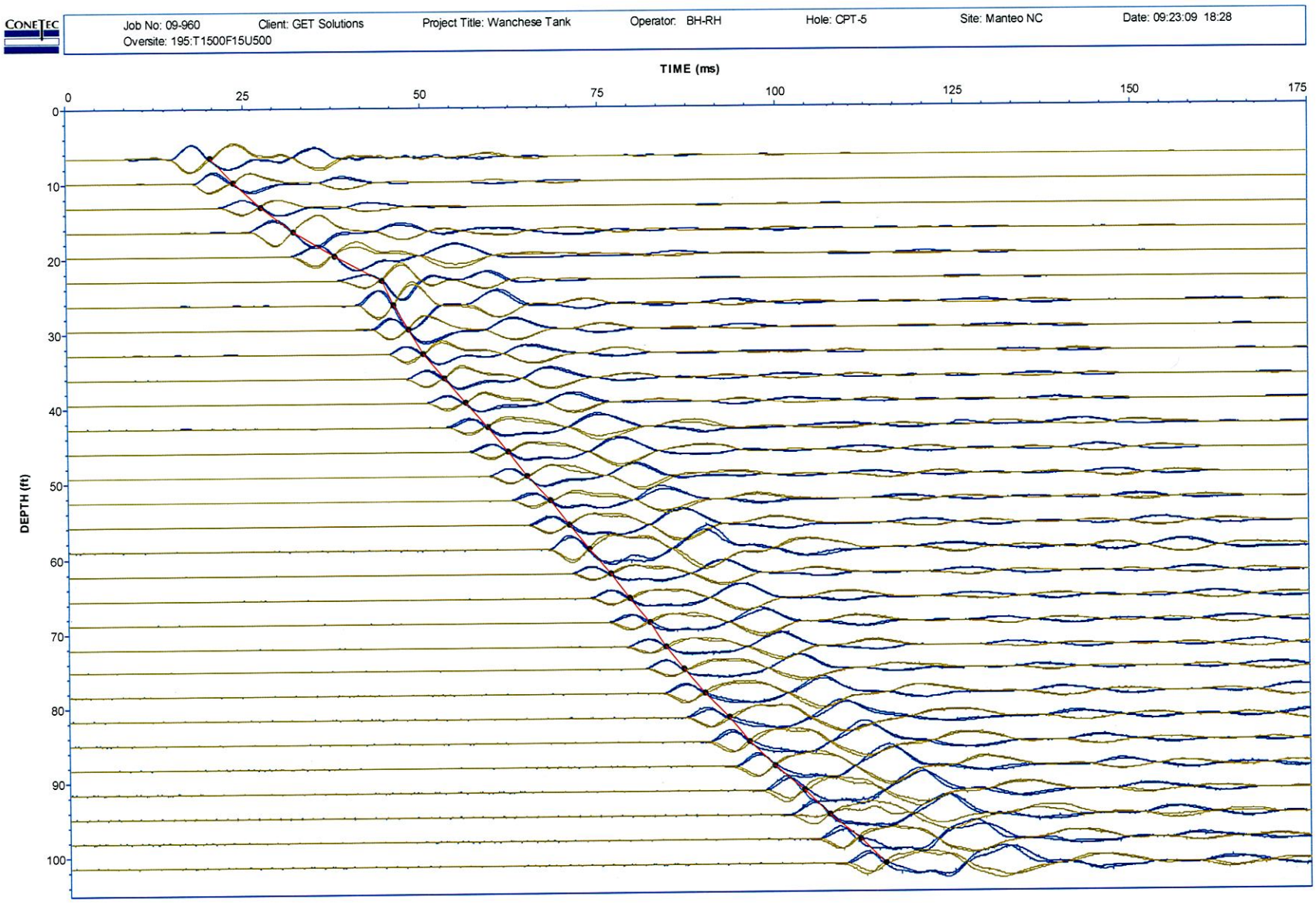
File: 960CP05.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997

CONETEC

Shear Wave Velocity- CPT-5
Manteo Tank
09-960
September 23, 2009




CONETEC
Job No: 09-960
Client: GET Solutions
Project Title: Wanchese Tank
Operator: BH-RH
Hole: CPT-5
Site: Manteo NC
Date: 09:23:09 18:28
Oversite: 195:T1500F15U500
TIME (ms)
0
25
50
75
100
125
150
175
DEPTH (ft)
0
10
20
30
40
50
60
70
80
90
100

Appendix C
Hand Auger Boring Logs

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-1

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Vista Lake
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 12-29-09
DEPTH TO WATER - INITIAL*: ▽ 2' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C 4.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM); (FILL)				HA			
	0.4	1	Black, moist, Sandy TOPSOIL		1		HA			
	0.8	2 ▽	Gray-Tan, wet, Clayey fine SAND (SC) with silt		2		HA			
	1.2	3	Gray-Tan, wet, Silty fine SAND (SM) with clay		3.5		HA			
	1.6	4 C	Boring terminated at 4.5 ft.							
	2	5								
		6								
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-2

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Viccars
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 12-29-09
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___ **CAVING>** ℄ 5.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	Tan-Gray, moist, Silty fine SAND (SM) mixed with Gravel; (Uncontrolled Fill)				HA			
	0.4	1								
		2	Gray, moist to wet, Silty fine SAND (SM)				HA			
	0.8		Tan from 2.5 feet							
		3	Wet from 3 feet							
		3.5	Tan-Reddish Tan, wet, Clayey fine SAND (SC) with silt				HA			
	1.2	4	Tan-Reddish Tan, wet, Silty fine SAND (SM)				HA			
		5								
	1.6		Boring terminated at 5.5 ft.							
		6								
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-3

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina — **PROJECT NO.:** EC09-249G
BORING LOCATION: California — **SURFACE ELEVATION:** INA
DRILLER: G E T Solutions, Inc. — **LOGGED BY:** P. Lankford, EIT
DRILLING METHOD: Hand Auger — **DATE:** 12-29-09
DEPTH TO WATER - INITIAL*: ▽ 1' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C 3'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7							
		1 ▽	Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) to Silty fine SAND (SM) Wet from 1 foot				HA			
	0.4									
		2								
	0.8									
		3	Boring terminated at 3 ft.							
	1.2	4								
		5								
	1.6									
		6								
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-4

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Fernando
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 2.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-29-09
CAVING> C 4.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	12 inches of TOPSOIL							
	0.4	1	Light Gray, moist, Clayey fine SAND (SC) with silt		1		HA			
	0.8	2	Light Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) Wet from 2.5 feet		2		HA			
	1.2	3	Tan, wet, poorly graded fine to medium SAND (SP)		3.5		HA			
	1.6	4	Boring terminated at 4.5 ft.							
	2	5								
		6								
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-5

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Cross
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 2.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-29-09
CAVING> ℄ 6'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			18 inches of TOPSOIL							
		1								
	0.4									
			1.5							
			Gray-Tan, moist, Clayey fine SAND (SC) with silt				HA			
		2								
			2							
			Gray-Tan, moist to wet, Silty fine SAND (SM) with clay				HA			
	0.8		▽ Wet from 2.5 feet							
		3								
			3.5							
			Tan-Gray, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
	1.2	4								
		5								
	1.6									
		6 ℄								
			Boring terminated at 6 ft.							
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-6

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Jones
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 2.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-29-09
CAVING> C 5.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7							
		1	Brown-Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
	0.4									
		2								
	0.8		Wet from 2.5 feet							
		3	Tan-Gray from 3 feet							
	1.2	4								
		5								
	1.6		C							
			Boring terminated at 5.5 ft.							
		6								
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-7

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Ananias Dare
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 12-28-09
DEPTH TO WATER - INITIAL*: ▽ 1.5' **AFTER 24 HOURS:** ▽ ___
CAVING> C. 4'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Tan, moist, Silty fine SAND (SM) with trace clay and trace small roots				HA			
		1								
	0.4									
			▽ 1.5							
			Reddish Tan, wet, Silty fine SAND (SM)				HA			
		2	2							
			Reddish Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	0.8	3								
	1.2	4	Boring terminated at 4 ft.							
		5								
	1.6									
		6								
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-8

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: West
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-29-09
CAVING> C 6.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	24 inches of TOPSOIL							
	0.4	1								
		2	Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics		2		HA			
	0.8	3								
			Wet from 3.5 feet ▽							
	1.2	4	Dark Brown, wet, Silty fine SAND (SM) with organics		4		HA			
	1.6	5								
		6								
	2		Boring terminated at 6.5 ft. C							
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-9

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Amelia
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-29-09
CAVING> C 5.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	Gray-Tan, moist, Silty fine SAND (SM) mixed with root mat				HA			
	0.4	1.5	Gray-Tan, moist to wet, Silty fine SAND (SM)				HA			
	0.8	3 ▽	Wet from 3 feet With trace Clay from 3 feet							
	1.2	4	Tan-Gray, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
	1.6	5 C	Boring terminated at 5.5 ft.							
	2	6								
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-10

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Tanali
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-29-09
CAVING> C 5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	18 inches of Sandy TOPSOIL							
	0.4	1								
			Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
	0.8	2								
	1.2	3								
		4 ▽	Wet from 4 feet							
	1.6	5 C	Boring terminated at 5 ft.							
	2	6								
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-11

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: East Woodlands (Offset 90' to the East)
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 12-29-09
DEPTH TO WATER - INITIAL*: ▽ 2.5' **AFTER 24 HOURS:** ▽ ___
CAVING> C. 3'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	Gray-Tan, moist, Silty fine SAND (SM) with clay; (Possible FILL)				HA			
	0.4	1								
			1.5							
		2	Gray-Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), with Marine Shell Fragments				HA			
	0.8		▽ Wet from 2.5 feet							
		3	C							
			Boring terminated at 3.5 ft.							
	1.2	4								
		5								
	1.6									
		6								
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-12

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
PROJECT NO.: EC09-249G
BORING LOCATION: Cannon Gate
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 12-29-09
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___
CAVING> C 6'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	12 inches of TOPSOIL							
		1	Gray, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt		1		HA			
	0.4	2	Tan from 2.5 feet							
	0.8	3	Wet from 3.5 feet ▽							
	1.2	4	Tan-Gray, wet, Clayey fine SAND (SC) with silt		4		HA			
		5	Tan-Gray, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)		5		HA			
	1.6	6 C	Boring terminated at 6 ft.							
	2	7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-13

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island, North Carolina
BORING LOCATION: Gravel Road After Bartow
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 1.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 12-28-09
CAVING> ℄ 4'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			Gray, moist, poorly graded fine to medium SAND (SP); (Possible FILL)				HA			
	0.4	1	Dark Gray-Brown, moist to wet, Silty fine SAND (SM) with organics				HA			
			▽ Wet from 1.5 feet							
		2								
	0.8		Dark Gray from 2.5 feet							
		3								
	1.2	4	℄ Boring terminated at 4 ft.							
		5								
	1.6									
		6								
	2									
		7								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-14

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: First at Harriot
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-8-10
CAVING> C 6.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	10 inches of TOPSOIL							
			0.8							
			Dark Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt, with trace organics				HA			
			1.5							
		2	Tan-Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) Light Gray from 2 feet				HA			
	0.8									
		4	Brown from 3.5 feet Wet from 3.5 feet							
	1.6									
		6								
			Boring terminated at 6.5 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-15

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: First at Amanda
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 2' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-8-10
CAVING> C 6'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	18 inches of TOPSOIL							
			1.5							
		2 ▽	Gray, moist to wet, Silty fine SAND (SM) with clay and with trace organics Wet from 2 feet				HA			
	0.8		3.5							
		4	Black, wet, Silty fine SAND (SM) with organics				HA			
			4.5							
	1.6		Brown, wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM), with trace organics				HA			
		6	Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-16

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Barlow at US-64
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-8-10
CAVING> C. 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	18 inches of TOPSOIL							
							HA			
		2	Tan, moist, Silty fine SAND (SM) with clay (1.5)				HA			
	0.8		Tan, moist, Clayey fine SAND (SC) with silt (2)				HA			
		4 ▽	Tan, moist, Silty fine SAND (SM) (2.5)				HA			
	1.6	6	Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt (4)							
	2.4	8	Boring terminated at 7 ft.							
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-17

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Barlowe at Wingina
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-8-10
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___
CAVING> ⌭ 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2								
	0.8									
		4 ▽	Wet from 4 feet							
	1.6									
		6								
			Boring terminated at 7 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-18

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Scuppenmong at Arbor
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 1.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-8-10

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	12 inches of TOPSOIL							
			Black, moist to wet, Silty fine SAND (SM) with clay and with organics		1		HA			
			▽ Wet from 1.5 feet							
		2								
	0.8									
		4								
	1.6		Dark Brown, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) with organics		5		HA			
		6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-19

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Scuppenmong at Dogwood
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-8-10
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	10 inches of TOPSOIL							
							HA			
			Gray-Tan, moist, Silty fine SAND (SM)							
			Tan from 1.5 feet							
		2	Reddish Tan, moist, Clayey fine SAND (SC) with silt				HA			
	0.8									
			Reddish Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		4 ▽	Wet from 4 feet							
			Gray from 5 feet							
	1.6	6	Boring terminated at 6 ft.							
	2.4	8								
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-20

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Gardens
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-8-10
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** ℄ 6.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7 Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2								
	0.8		2.5 Light Gray-Tan, moist, Clayey fine SAND (SC) with silt				HA			
			3.5 Light Gray, wet, Silty fine SAND (SM)				HA			
		4	4 Light Gray, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	1.6	6	℄ Boring terminated at 6.5 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-21

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: US-64 at Meekins
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-8-10
CAVING> C 6'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Tan-Gray, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
			1 Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2	2 Light Gray-Tan, moist to wet, Silty fine SAND (SM) with trace clay				HA			
	0.8		Wet from 3 feet ▽							
		4	4 Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	1.6	6	Boring terminated at 6 ft.							
	2.4	8								
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-22

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Raleigh Wood
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-4-10
DEPTH TO WATER - INITIAL*: ▽ 2.5' **AFTER 24 HOURS:** ▽ ___
CAVING> ℄ 5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Tan, moist, Silty fine SAND (SM)				HA			
			1.5 Tan, moist, Clayey fine SAND (SC) with silt				HA			
		2	2 Tan, moist to wet, Silty fine SAND (SM)				HA			
	0.8		▽ Wet from 2.5 feet							
			3 Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
		4								
	1.6		Boring terminated at 5 ft.							
		6								
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-23

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Fields
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-4-10
DEPTH TO WATER - INITIAL*: ▼ 5' **AFTER 24 HOURS:** ▼ ___ **CAVING>** C.

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2								
	0.8									
			3.5 Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
		4								
	1.6		▽ Wet from 5 feet							
		6								
	2.4	8	Boring terminated at 8 ft.							
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-24

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Steve Basnight
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-4-10
DEPTH TO WATER - INITIAL*: ▽ ___ **AFTER 24 HOURS:** ▽ ___ **CAVING>** ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Tan-Gray, moist, Silty fine SAND (SM)				HA			
		2	Tan from 1.5 feet							
	0.8		2.5 Reddish Tan, moist, Clayey fine SAND (SC) with silt				HA			
			3 Tan, moist, Silty fine SAND (SM)				HA			
		4								
			4.5 Tan, moist, poorly graded fine to medium SAND (SP)				HA			
	1.6	6								
	2.4	8	Boring terminated at 8 ft.							
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-25

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: US-64 at Candela
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ___ **AFTER 24 HOURS:** ___
PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-3-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			14 inches of TOPSOIL							
			1.2							
			Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2								
	0.8									
			Gray from 3.5 feet							
		4								
			5							
	1.6		Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
		6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-26

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Holy Ridge
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-3-10
DEPTH TO WATER - INITIAL*: ___ **AFTER 24 HOURS:** ___ **CAVING>** ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	4 inches of TOPSOIL							
			0.3				HA			
			Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt							
			Gray from 1 foot							
		2	Tan from 2 feet							
	0.8		2.5				HA			
			Tan, moist, Clayey fine SAND (SC) with silt							
		4	4				HA			
	1.6		Tan, moist, poorly graded fine to medium SAND (SP)							
		6	Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-27

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: US-64 at Pearce
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-3-10
DEPTH TO WATER - INITIAL*: ___ **AFTER 24 HOURS:** ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Tan-Gray, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt Tan from 1 foot				HA			
		2	Tan-Gray from 2 feet							
	0.8		Tan from 2.5 feet							
		4								
			4.5							
			Reddish Tan, moist, silty fine SAND (SM) with trace clay				HA			
	1.6	6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-28

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Pearce at Fort Hugar
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 4.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-3-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2	2							
	0.8		Light Gray, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
			3							
			Mottled Gray-Reddish Tan, moist, Clayey fine SAND (SC) with silt				HA			
		4	4							
			Light Gray, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt Wet from 4.5 feet				HA			
	1.6	6	Boring terminated at 6 ft.							
	2.4	8								
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-29

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Fort Raleigh at National Park
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-3-10
DEPTH TO WATER - INITIAL*: ▽ ___ **AFTER 24 HOURS:** ▽ ___ **CAVING>** ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	0.8	2								
		4								
	1.6									
		6	Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-30

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Brakewood at N Fearing
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-3-10
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			8 inches of TOPSOIL							
			0.7							
			Light Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
		2								
	0.8									
			▽ Wet from 3 feet							
		4								
	1.6									
		6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-31

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Airport at Warren
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-3-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Reddish Tan, moist, Silty fine SAND (SM) With clay from 0.5 to 1.5 feet				HA			
		2								
	0.8		2.5							
			Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
			Wet from 3.5 feet ▽							
		4								
	1.6									
		6	Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-32

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Airport at Daphne
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 1.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-4-10
CAVING> ℄ 4.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	12 inches of TOPSOIL							
		1	Light Gray, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt Wet from 1.5 feet				HA			
	0.8	2								
		4	Boring terminated at 4.5 ft.							
	1.6	6								
	2.4	8								
		10								
	3.2	12								
	4	14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-33

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Airport at Old Country
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-4-10
DEPTH TO WATER - INITIAL*: ▽ 6' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			12 inches of TOPSOIL							
			1							
			Gray, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
		2	Tan from 1.5 feet							
	0.8									
		4								
	1.6									
		6 ▽	Wet from 6 feet							
	2.4	8								
			Boring terminated at 8 ft.							
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-34

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: D Victor Meekins at Sunnyside
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-4-10
DEPTH TO WATER - INITIAL*: ___ **AFTER 24 HOURS:** ___ **CAVING>** ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7				HA			
			Tan-Gray, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt							
		2	Tan from 2 feet							
	0.8									
		4								
	1.6									
		6								
	2.4	8	Boring terminated at 8 ft.							
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-35

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: HWY-345
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 2-24-10
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** ___ 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5 Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2	Gray-Tan from 1.5 feet							
	0.8		2.5 Dark Gray, moist, Clayey fine SAND (SC) with silt, with organics				HA			
			▽ 3.5 Brown, wet, Silty fine SAND (SM) with organics				HA			
		4								
	1.6		5 Tan-Gray, wet, Silty fine SAND (SM)				HA			
		6								
			Boring terminated at 7 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-36

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC **PROJECT NO.:** EC09-249G
BORING LOCATION: HWY-345 **SURFACE ELEVATION:** INA
DRILLER: G E T Solutions, Inc. **LOGGED BY:** P. Lankford, EIT
DRILLING METHOD: Hand Auger **DATE:** 2-24-10
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C 5.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			Gray-Tan, moist, Silty fine SAND (SM) with clay				HA			
		2	Gray, moist, Clayey fine SAND (SC) with silt, with trace organics				HA			
	0.8		Black, moist, Silty fine SAND (SM) with clay and organics				HA			
			Gray-Tan, wet, Silty fine SAND (SM) with clay				HA			
		4								
	1.6		C							
		6	Boring terminated at 5.5 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.

Geotechnical • Environmental • Testing

BORING LOG HA-37

PROJECT:	Roanoke Island Water System Improvements		
CLIENT:	CDM		
PROJECT LOCATION:	Roanoke Island/ Manteo/ Wanchese, NC	**PROJECT NO.:**	EC09-249G
BORING LOCATION:	HWY-345	**SURFACE ELEVATION:**	INA
DRILLER:	G E T Solutions, Inc.	**LOGGED BY:**	P. Lankford, EIT
DRILLING METHOD:	Hand Auger	**DATE:**	3-2-10
DEPTH TO WATER - INITIAL*:	∇ 3' **AFTER 24 HOURS:** ▼	**CAVING>** C	7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS: Plastic Limit ⊢ Liquid Limit; Moisture Content - ●; N-Value - ▨; 10 20 30 40 50 60 70
	0	0	18 inches of TOPSOIL								
		1.5	Tan-Brown, moist to wet, Silty fine SAND (SM) Gray from 2.5 feet Wet from 3 feet				HA				
		3.5	Black, wet, Silty, Clayey PEAT (PT)				HA				
		4.5	Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet				HA				
		7	Boring terminated at 7 ft.								

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-38

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> C 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	24 inches of TOPSOIL							
	0.8	2	Dark Gray, moist, Silty fine SAND (SM) with clay and organics		2		HA			
			Gray, moist to wet, Silty fine SAND (SM) with trace clay		3		HA			
		4	Wet from 3.5 feet ▽							
	1.6		Gray, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt		4		HA			
		6	Tan from 6 feet							
	2.4	8	Boring terminated at 7 ft.							
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-39

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> ▽ 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			Tan-Brown, moist, Silty fine SAND (SM)				HA			
	0.8	2	Black, moist, Silty, Clayey PEAT (PT)				HA			
			Black, moist, Silty fine SAND (SM) with organics				HA			
	1.6	4	Brown, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) Wet from 3.5 feet Tan from 4 feet							
		6								
	2.4	8	Boring terminated at 7 ft.							
	3.2	10								
	4	12								
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-40

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: HWY-345
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-2-10
DEPTH TO WATER - INITIAL*: ▼ 4' **AFTER 24 HOURS:** ▼ ___
CAVING> C 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	10 inches of TOPSOIL							
			0.8							
			Gray, moist, Silty fine SAND (SM)				HA			
		2	Gray-Tan from 2 feet							
	0.8		Tan from 2.5 feet							
		4 ▽	4				HA			
			Gray-Tan, wet, Clayey fine SAND (SC) with silt							
			5				HA			
	1.6	6	Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt							
			Boring terminated at 7 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-41

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 4' **AFTER 24 HOURS:** ▼ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> C 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			4 inches of TOPSOIL							
			0.3' Tan, moist, Silty fine SAND (SM) with trace clay				HA			
			1.5' Tan-Gray, moist, Clayey fine SAND (SC) with silt				HA			
		2	2' Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	0.8									
		4 ▽	Wet from 4 feet							
	1.6									
		6								
			Boring terminated at 7 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-42

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	10 inches of TOPSOIL							
							HA			
			Tan-Gray, moist, Silty fine SAND (SM)							
			0.8 / 1.5				HA			
		2	Dark Brown, moist, Silty fine SAND (SM) with clay and organics							
			2				HA			
	0.8		Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)							
							HA			
			2.5							
			Gray, moist, Silty fine SAND (SM) with clay							
			3.5				HA			
		4	Tan-Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) Brown from 4 feet							
	1.6		▽ Wet from 5 feet							
		6								
	2.4	8	Boring terminated at 8 ft.							
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-43

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: HWY-345
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-2-10
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** ℄ 5.5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	4 inches of TOPSOIL							
			0.3 Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
			1' Reddish Tan, moist, Clayey fine SAND (SC) with silt				HA			
		2	2 Reddish Tan, moist, Silty fine SAND (SM)				HA			
	0.8									
			▽ 3.5 Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
		4								
	1.6									
			℄ Boring terminated at 5.5 ft.							
		6								
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-44

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Old Wharf at Cudworth
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▼
PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> C 5'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	6 inches of TOPSOIL							
			0.5							
			Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
			Gray-Tan from 1.5 feet							
		2	2							
	0.8		Dark Gray, moist to wet, Silty fine SAND (SM) with organics				HA			
			Wet from 3 feet ▽							
			3.5							
		4	Black, wet, Silty, Clayey PEAT (PT)				HA			
	1.6		Boring terminated at 5 ft.							
		6								
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-45

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Old Wharf at Schoolhouse
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-2-10
DEPTH TO WATER - INITIAL*: ▽ 2.5' **AFTER 24 HOURS:** ▽ ___
CAVING> ⊂ 6'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7							
			Dark Gray, moist, Silty fine SAND (SM) with organics				HA			
			Black from 1.5 feet							
		2								
	0.8		2.5 ▽							
			Gray, wet, Clayey fine SAND (SC) with silt				HA			
		4								
			4.5							
			Dark Gray, wet, Silty fine SAND (SM) with organics				HA			
	1.6									
		6 ⊂								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-46

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: Old Wharf at Friendly
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> ℄ ___

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2	Black, moist, Silty fine SAND (SM) with organics				HA			
	0.8		▽							
			Gray-Tan, wet, Silty fine SAND (SM)				HA			
		4	Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM)				HA			
	1.6	6	Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-47

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Old Wharf at Beverly
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-2-10
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	10 inches of TOPSOIL							
			0.8							
			Gray-Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
			1.5							
		2	Tan-Gray, moist, Clayey fine SAND (SC) with silt				HA			
	0.8		2.5							
			Light Gray-Tan, moist, Silty fine SAND (SM) with clay				HA			
			3							
			Dark Gray, moist to wet, Silty fine SAND (SM) with organics				HA			
		▽	Wet from 3.5 feet							
		4								
	1.6									
		6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-48

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345 at Pine Acres
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	18 inches of TOPSOIL							
							HA			
		2	Light Gray, moist, Silty fine SAND (SM)							
	0.8		Dark Gray, moist, Clayey fine SAND (SC) with silt, with organics				HA			
			Dark Brown, moist to wet, Silty fine SAND (SM) with organics				HA			
		▽	Wet from 3.5 feet Auger refusal at 4 feet - Possible large root							
		4	Boring terminated at 4 ft.							
	1.6	6								
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-49

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: HWY-345 at Tillett
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-2-10
DEPTH TO WATER - INITIAL*: ▽ 3.5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C 6'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7							
			Tan-Gray, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
		2								
	0.8									
			Gray-Tan from 3 feet							
			Wet from 3.5 feet ▽							
		4								
			4.5							
			Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	1.6									
		6 C								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

**The initial groundwater reading may not be indicative of the static groundwater level.*

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-50

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345 at Jovers
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▼ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> ℄ 7'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	12 inches of TOPSOIL							
					1		HA			
			Tan-Gray, moist, Clayey fine SAND (SC) with silt							
					1.5		HA			
		2	Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM) Tan-Gray from 2 feet				HA			
	0.8		▽ Wet from 3 feet							
		4			4		HA			
			Tan, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt							
	1.6	6								
			Boring terminated at 7 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG
HA-51

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
BORING LOCATION: HWY-345 at C B Daniels Sr
DRILLER: G E T Solutions, Inc.
DRILLING METHOD: Hand Auger
DEPTH TO WATER - INITIAL*: ▽ 3' **AFTER 24 HOURS:** ▼ ___

PROJECT NO.: EC09-249G
SURFACE ELEVATION: INA
LOGGED BY: P. Lankford, EIT
DATE: 3-2-10
CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			15 inches of TOPSOIL							
			1.25							
		2	Tan-Gray, moist, Clayey fine SAND (SC) with silt				HA			
	0.8		2.5							
			Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt Wet from 3 feet				HA			
▽		4								
	1.6									
		6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-52

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Harbor
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-2-10
DEPTH TO WATER - INITIAL*: ▽ 5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0								
			6 inches of TOPSOIL							
			0.5							
			Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	0.8	2								
		4								
	1.6		▽ Wet from 5 feet							
		6								
			Boring terminated at 6 ft.							
	2.4	8								
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

GET Solutions, Inc.
Geotechnical • Environmental • Testing

BORING LOG HA-53

PROJECT: Roanoke Island Water System Improvements
CLIENT: CDM
PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC
PROJECT NO.: EC09-249G
BORING LOCATION: Fort Raleigh
SURFACE ELEVATION: INA
DRILLER: G E T Solutions, Inc.
LOGGED BY: P. Lankford, EIT
DRILLING METHOD: Hand Auger
DATE: 3-3-10
DEPTH TO WATER - INITIAL*: ▽ 5' **AFTER 24 HOURS:** ▽ ___ **CAVING>** ℄ 8'

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200
	0	0	8 inches of TOPSOIL							
			0.7							
			Tan, moist, poorly graded fine to medium SAND (SP)				HA			
		2	2							
	0.8		Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM)				HA			
			Tan from 3 feet							
			3.5							
		4	Tan, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt				HA			
	1.6		▽ Wet from 5 feet							
		6								
	2.4	8	℄							
			Boring terminated at 8 ft.							
		10								
	3.2									
		12								
	4									
		14								

TEST RESULTS
Plastic Limit ⊢ Liquid Limit
Moisture Content - ●
N-Value - ▨
10 20 30 40 50 60 70

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Notes:

*The initial groundwater reading may not be indicative of the static groundwater level.

SS = Split Spoon Sample
ST = Shelby Tube Sample
HA = Hand Auger Sample
BS = Bulk Sample
WOH = Weight of Hammer

KEY TO SYMBOLS

Symbol Description

Strata symbols


Topsoil


Poorly graded Sand with silt and organics


Silty Sand


Silty Sand with organics


Clayey Sand


Poorly graded Sand with Silt


Poorly graded Sand


Clayey Sand with Organics


Peat

Misc. Symbols


Water table during drilling


Depth to caving

Notes:

1. Exploratory borings were drilled on 3-3-10 using a 4-inch diameter continuous flight power auger.

2. No free water was encountered at the time of drilling or when re-checked the following day.

3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.

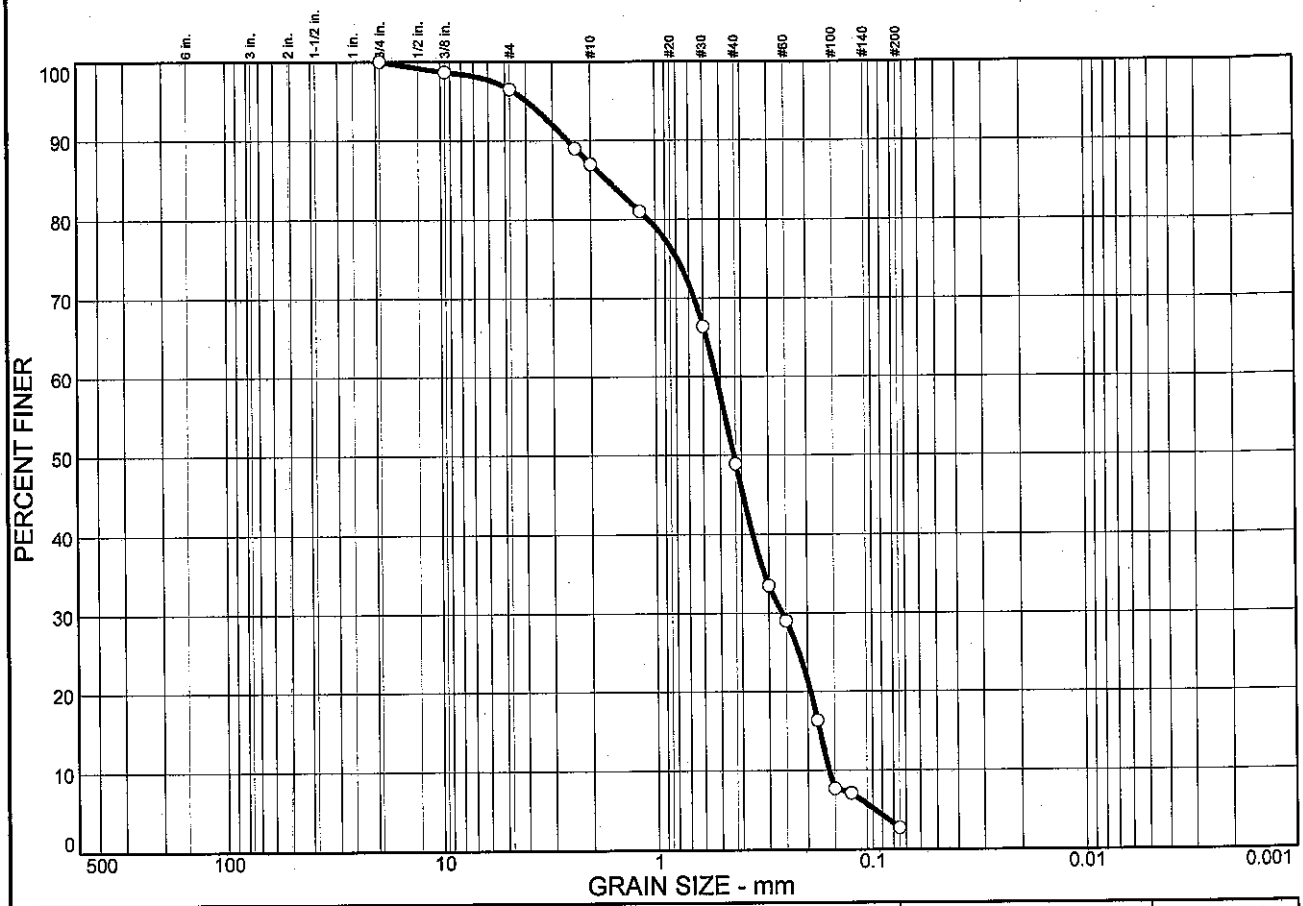
4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.

Appendix D

Geotechnical Laboratory Test Results

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.5	93.8	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75 in.	100.0		
0.375 in.	98.7		
#4	96.5		
#8	89.0		
#10	87.0		
#16	81.0		
#30	66.4		
#40	48.9		
#50	33.5		
#60	29.0		
#80	16.3		
#100	7.7		
#120	7.1		
#200	2.7		

* (no specification provided)

Soil Description

Poorly graded SAND (SP) with trace organics (organic content = 0.8%)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 1.68 D_{60}= 0.523 D_{50}= 0.434
D_{30}= 0.261 D_{15}= 0.176 D_{10}= 0.160
C_u= 3.28 C_c= 0.81

Classification

USCS= SP AASHTO= A-1-b

Remarks

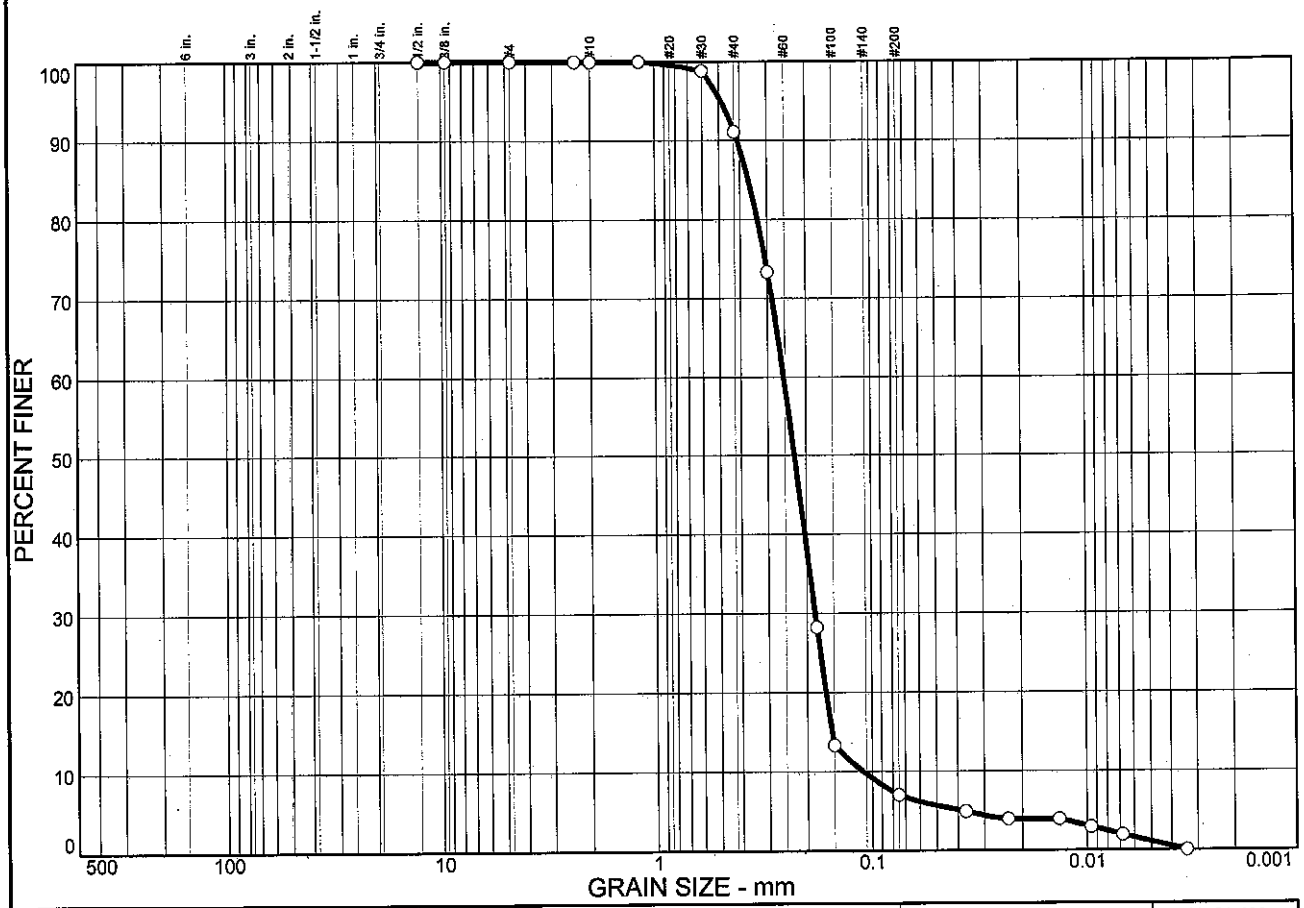
Visible marine shell fragments retained on the following sieves: 3/ 8", #4, #8, #10, #16, #30

Sample No.: S-2 **Source of Sample:** **Date:**
Location: B-1 **Elev./Depth:** 2 to 4 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	93.0	6.0	1.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	98.8		
#40	91.1		
#50	73.3		
#80	28.2		
#100	13.3		
#200	7.0		

* (no specification provided)

Soil Description

Poorly graded SAND (SP-SM) with silt, with trace organics (organic content = 1.8%)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.366 D_{60}= 0.254 D_{50}= 0.227
D_{30}= 0.184 D_{15}= 0.154 D_{10}= 0.110
C_u= 2.30 C_c= 1.20

Classification

USCS= SP-SM AASHTO= A-3

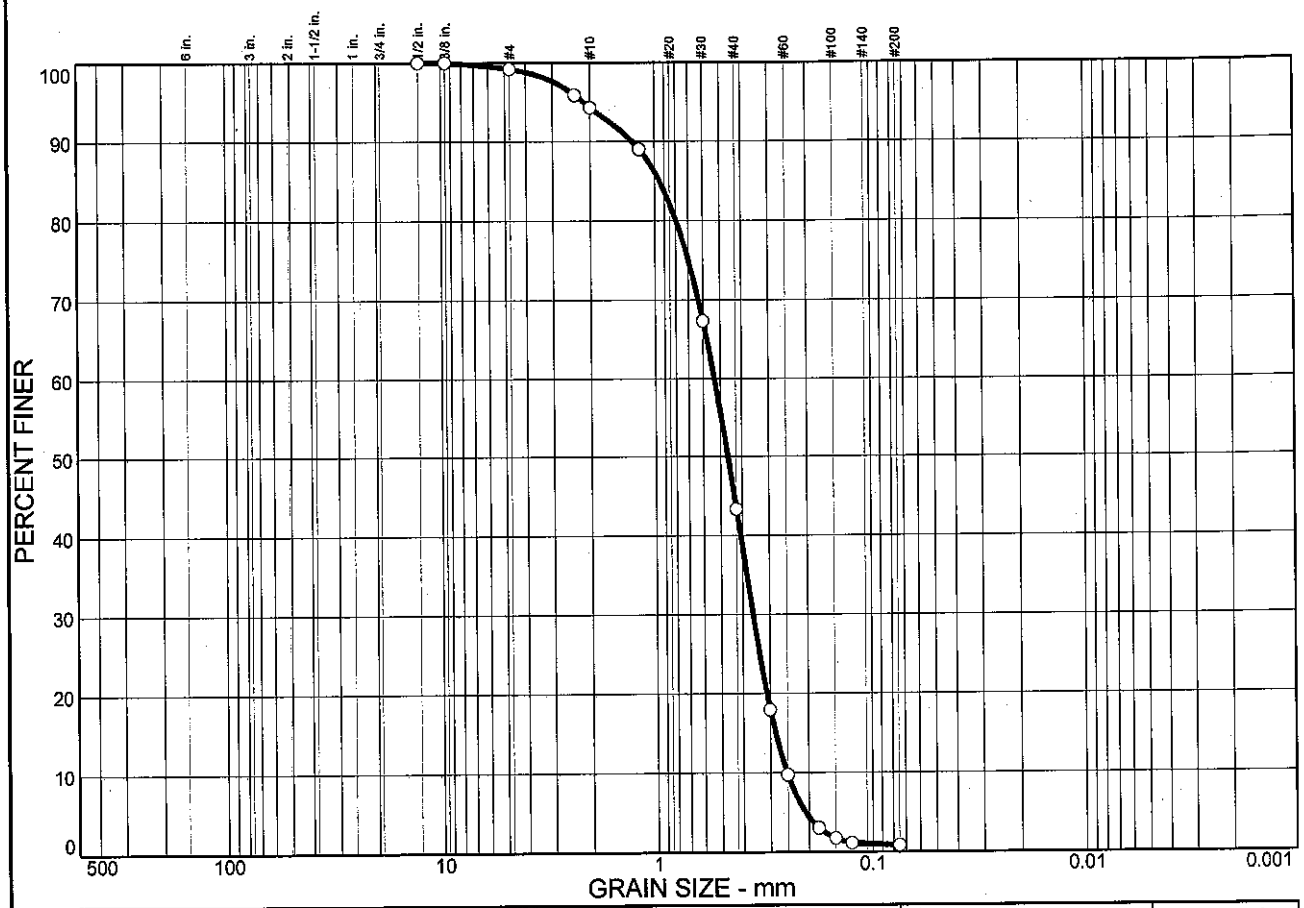
Remarks

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-1 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.8	98.4	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	99.2		
#8	95.9		
#10	94.3		
#16	89.0		
#30	67.3		
#40	43.3		
#50	17.9		
#60	9.7		
#80	3.0		
#100	1.7		
#120	1.1		
#200	0.8		

* (no specification provided)

Soil Description

Poorly graded SAND (SP)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.950 D_{60}= 0.534 D_{50}= 0.464
D_{30}= 0.359 D_{15}= 0.284 D_{10}= 0.252
C_u= 2.12 C_c= 0.96

Classification

USCS= SP AASHTO= A-1-b

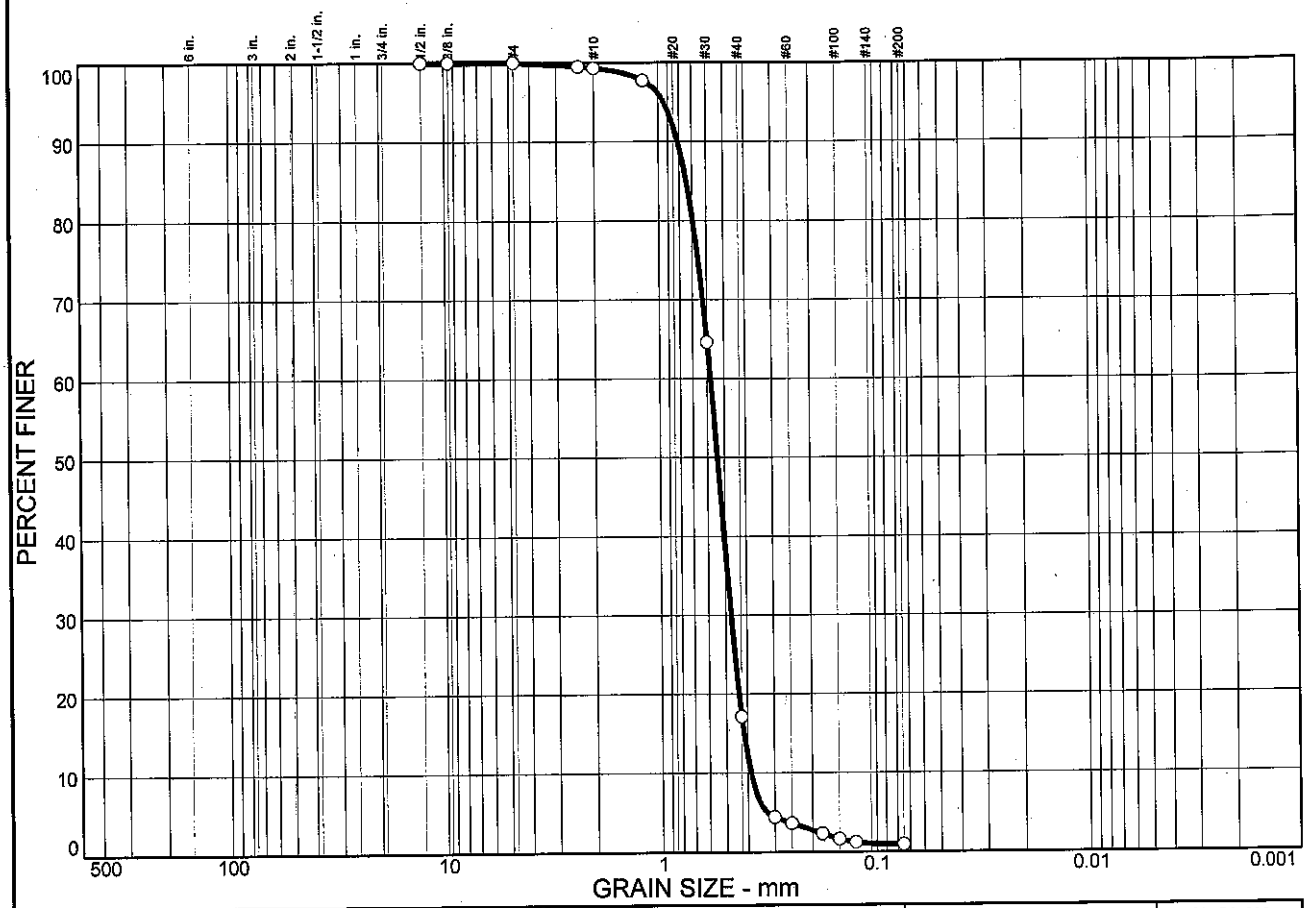
Remarks

Sample No.: S-8 **Source of Sample:** **Date:**
Location: B-1 **Elev./Depth:** 18 to 20 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.1	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	99.5		
#10	99.3		
#16	97.7		
#30	64.6		
#40	17.1		
#50	4.4		
#60	3.6		
#80	2.3		
#100	1.6		
#120	1.2		
#200	0.9		

* (no specification provided)

Soil Description

Poorly graded SAND (SP)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.743 D_{60}= 0.580 D_{50}= 0.541
D_{30}= 0.473 D_{15}= 0.415 D_{10}= 0.387
C_u= 1.50 C_c= 1.00

Classification

USCS= SP AASHTO= A-1-b

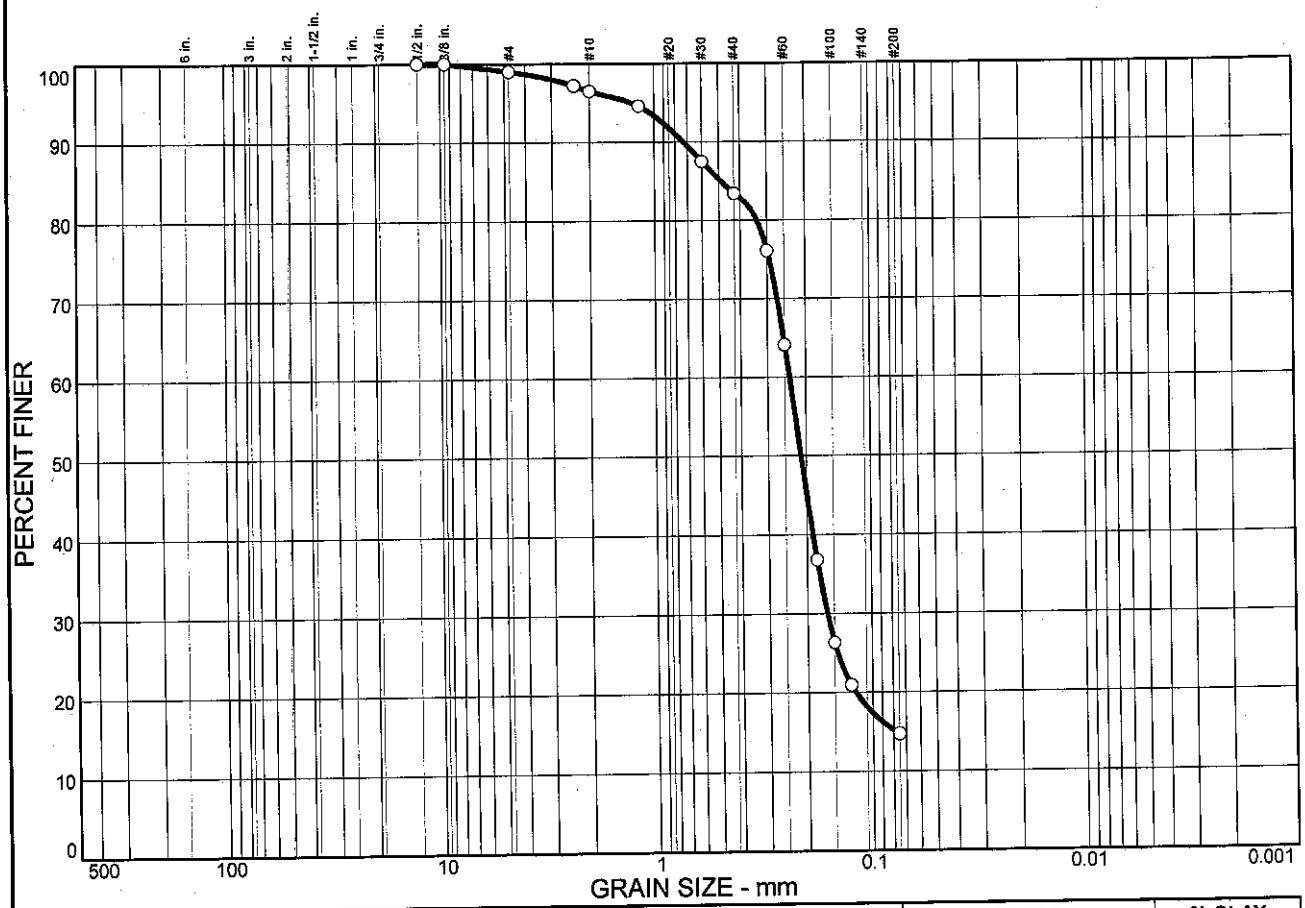
Remarks

Sample No.: S-10 **Source of Sample:** **Date:**
Location: B-1 **Elev./Depth:** 28 to 30 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.0	84.3	14.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	99.0		
#8	97.2		
#10	96.5		
#16	94.6		
#30	87.5		
#40	83.4		
#50	76.1		
#60	64.1		
#80	36.8		
#100	26.3		
#120	20.9		
#200	14.7		

* (no specification provided)

Soil Description

Silty SAND (SM)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.493 D_{60}= 0.238 D_{50}= 0.212
D_{30}= 0.162 D_{15}= 0.0780 D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

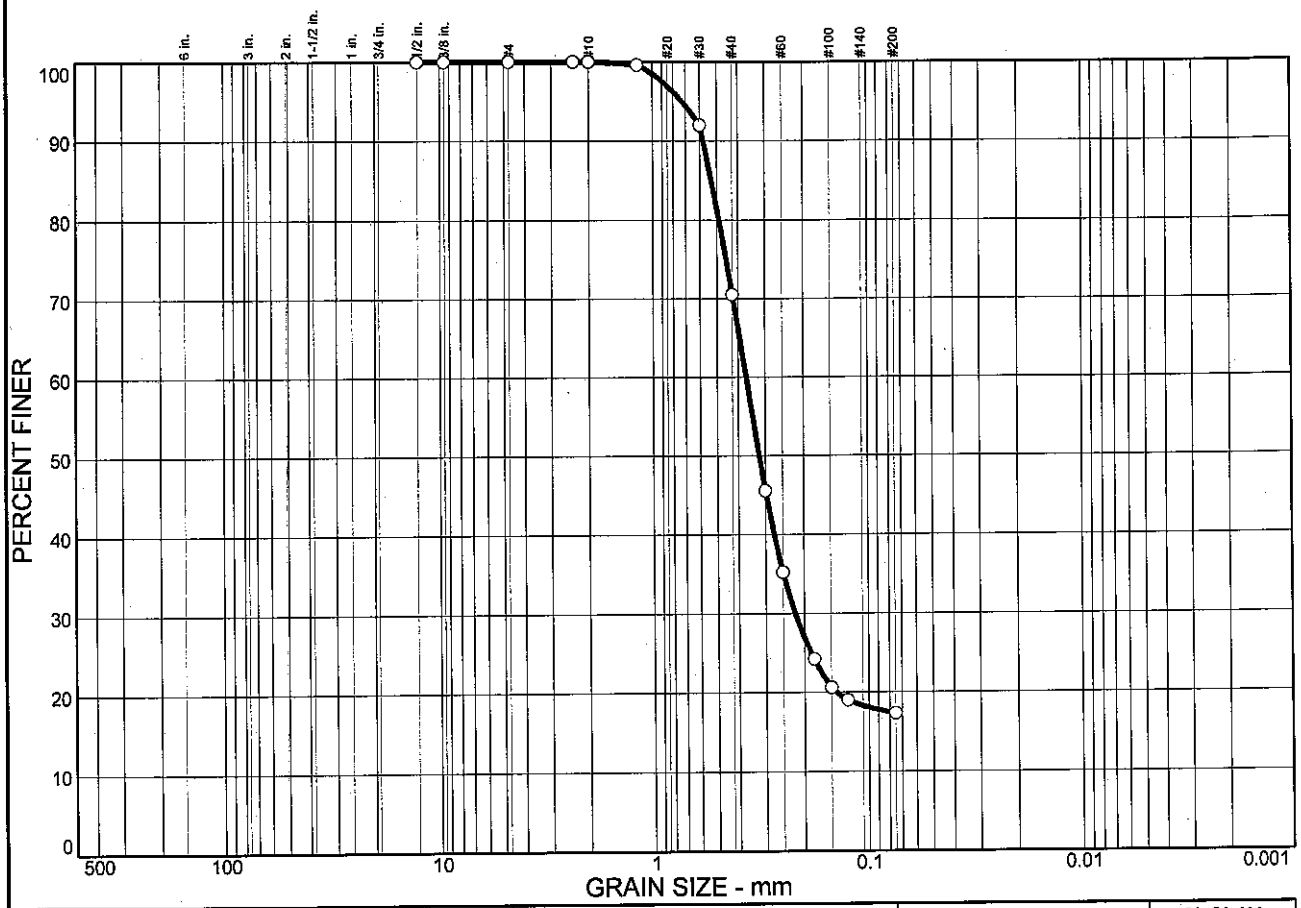
Visible marine shell fragments retained on the following sieves: #4, #8, #10, #16, #30, #40, #50

Sample No.: S-16 **Source of Sample:** **Date:**
Location: B-1 **Elev./Depth:** 58 to 60 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	82.7	17.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.6		
#30	92.0		
#40	70.5		
#50	45.5		
#60	35.2		
#80	24.2		
#100	20.6		
#120	19.0		
#200	17.3		

* (no specification provided)

Soil Description

Silty SAND (SM) with trace organics (organic content = 1.0%)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.532 D_{60}= 0.368 D_{50}= 0.321
D_{30}= 0.220 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

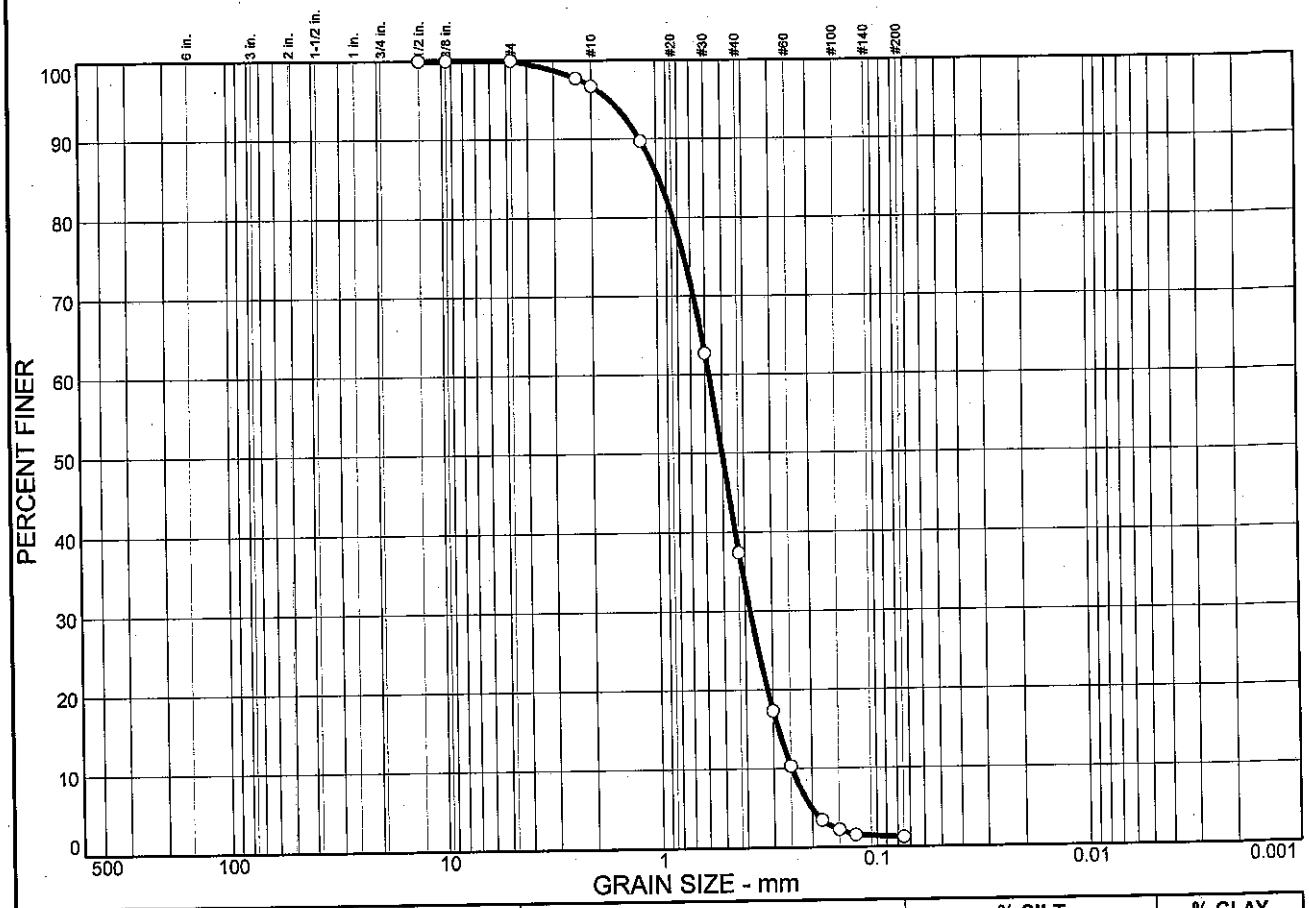
Remarks

Sample No.: S-2B **Source of Sample:** **Date:**
Location: B-2 **Elev./Depth:** 3 to 4 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.8	1.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	97.7		
#10	96.7		
#16	89.7		
#30	62.7		
#40	37.4		
#50	17.3		
#60	10.3		
#80	3.4		
#100	2.2		
#120	1.5		
#200	1.2		

* (no specification provided)

Soil Description

Poorly graded SAND (SP)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.976 D_{60}= 0.577 D_{50}= 0.503
D_{30}= 0.380 D_{15}= 0.284 D_{10}= 0.248
C_u= 2.33 C_c= 1.01

Classification

USCS= SP AASHTO= A-1-b

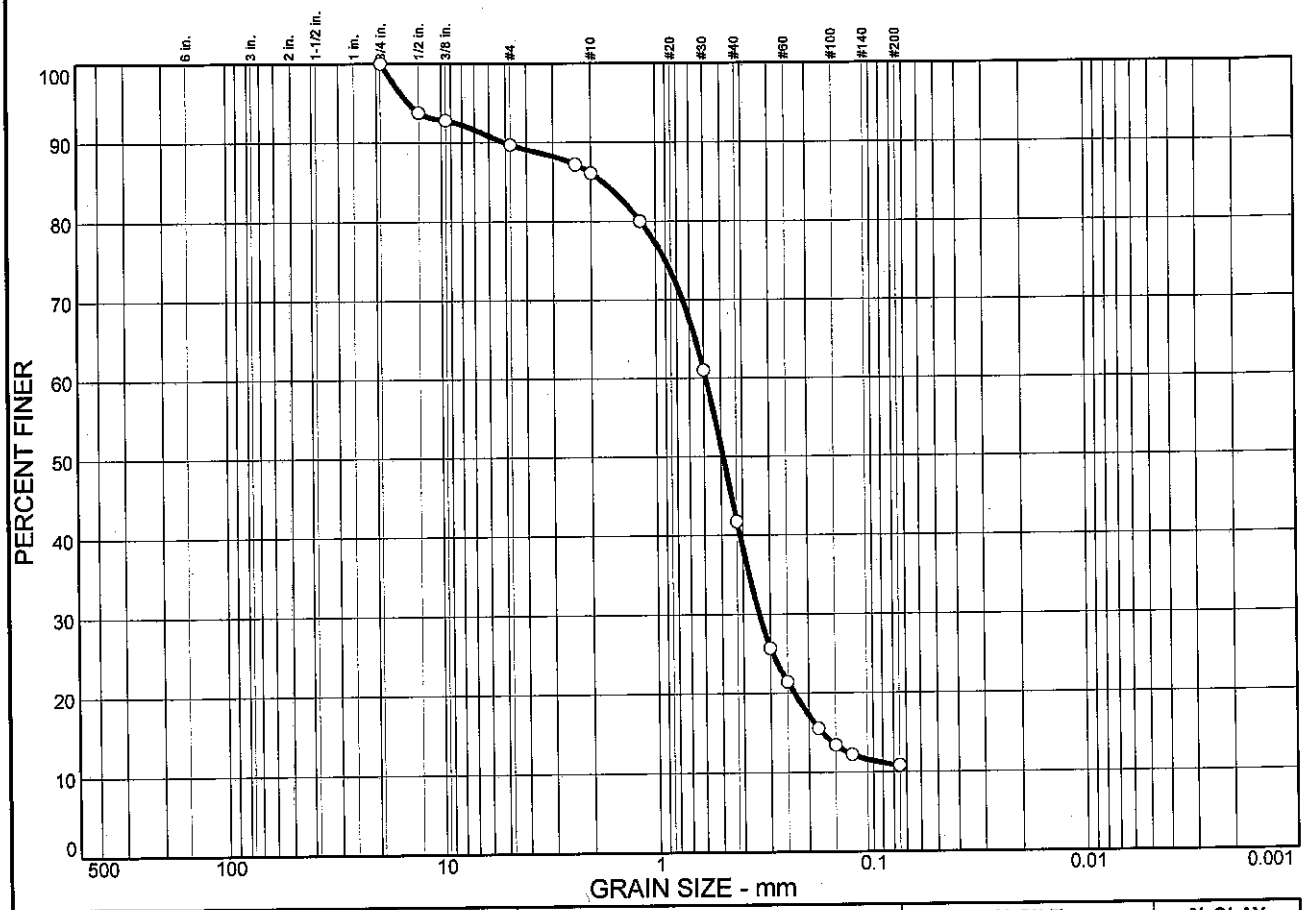
Remarks

Sample No.: S-7 **Source of Sample:** **Date:**
Location: B-2 **Elev./Depth:** 13 to 15 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.3	78.9	10.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75 in.	100.0		
0.5 in.	93.8		
0.375 in.	92.8		
#4	89.7		
#8	87.2		
#10	86.1		
#16	80.0		
#30	61.0		
#40	41.7		
#50	25.7		
#60	21.4		
#80	15.5		
#100	13.4		
#120	12.2		
#200	10.8		

* (no specification provided)

Soil Description

Poorly graded SAND (SP-SM) with silt

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 1.76 D_{60}= 0.588 D_{50}= 0.490
D_{30}= 0.337 D_{15}= 0.174 D_{10}=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

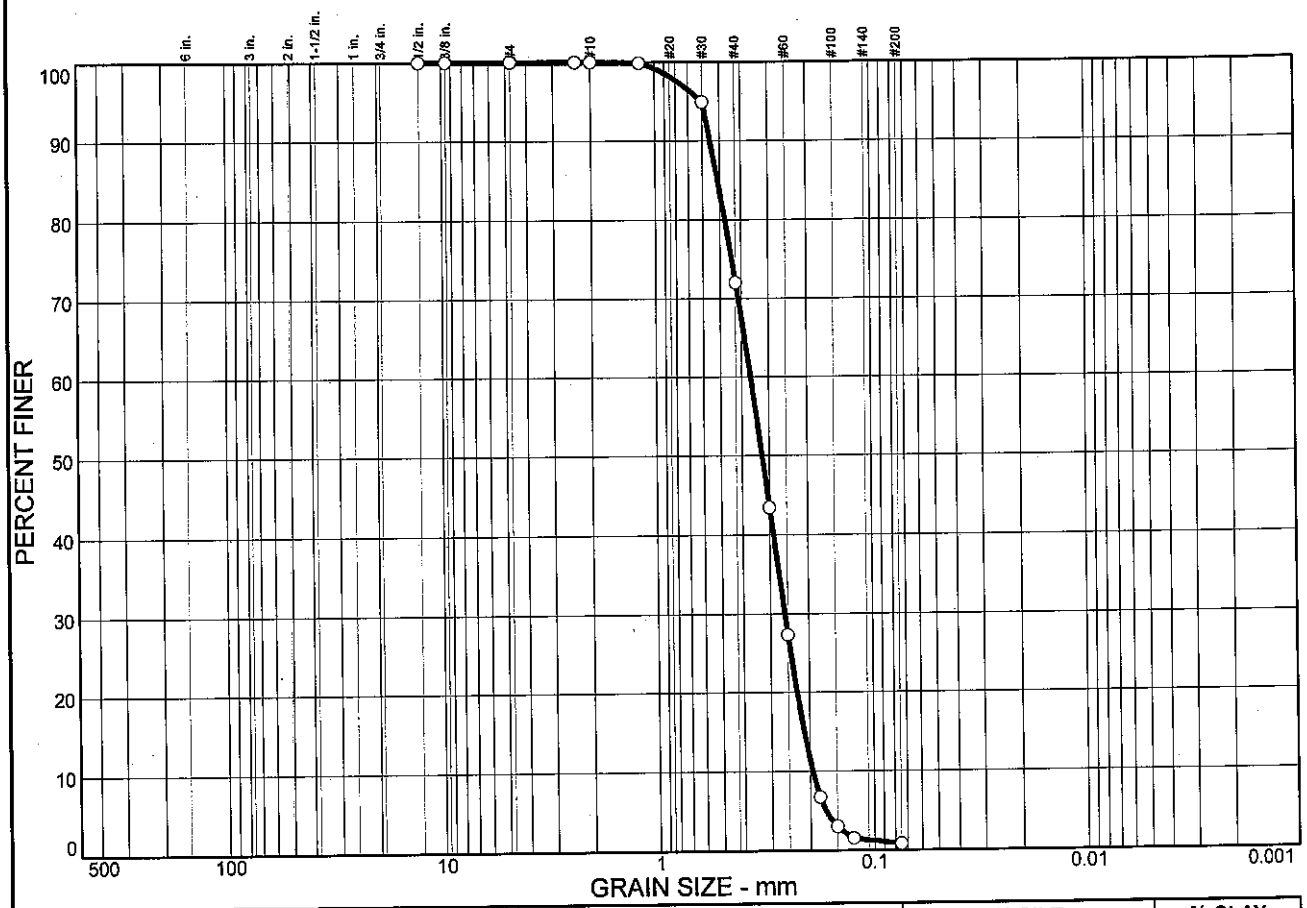
Visible marine shell fragments retained on the following sieves: 1/2", 3/8", #4, #8, #10, #16, #30, #40, #50

Sample No.: S-16 **Source of Sample:** **Date:**
Location: B-2 **Elev./Depth:** 58 to 60 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.2	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.9		
#30	94.9		
#40	72.0		
#50	43.4		
#60	27.3		
#80	6.7		
#100	3.0		
#120	1.5		
#200	0.8		

* (no specification provided)

Soil Description

Poorly graded SAND (SP)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.513 D_{60}= 0.364 D_{50}= 0.323
D_{30}= 0.258 D_{15}= 0.212 D_{10}= 0.195
C_u= 1.87 C_c= 0.94

Classification

USCS= SP AASHTO= A-3

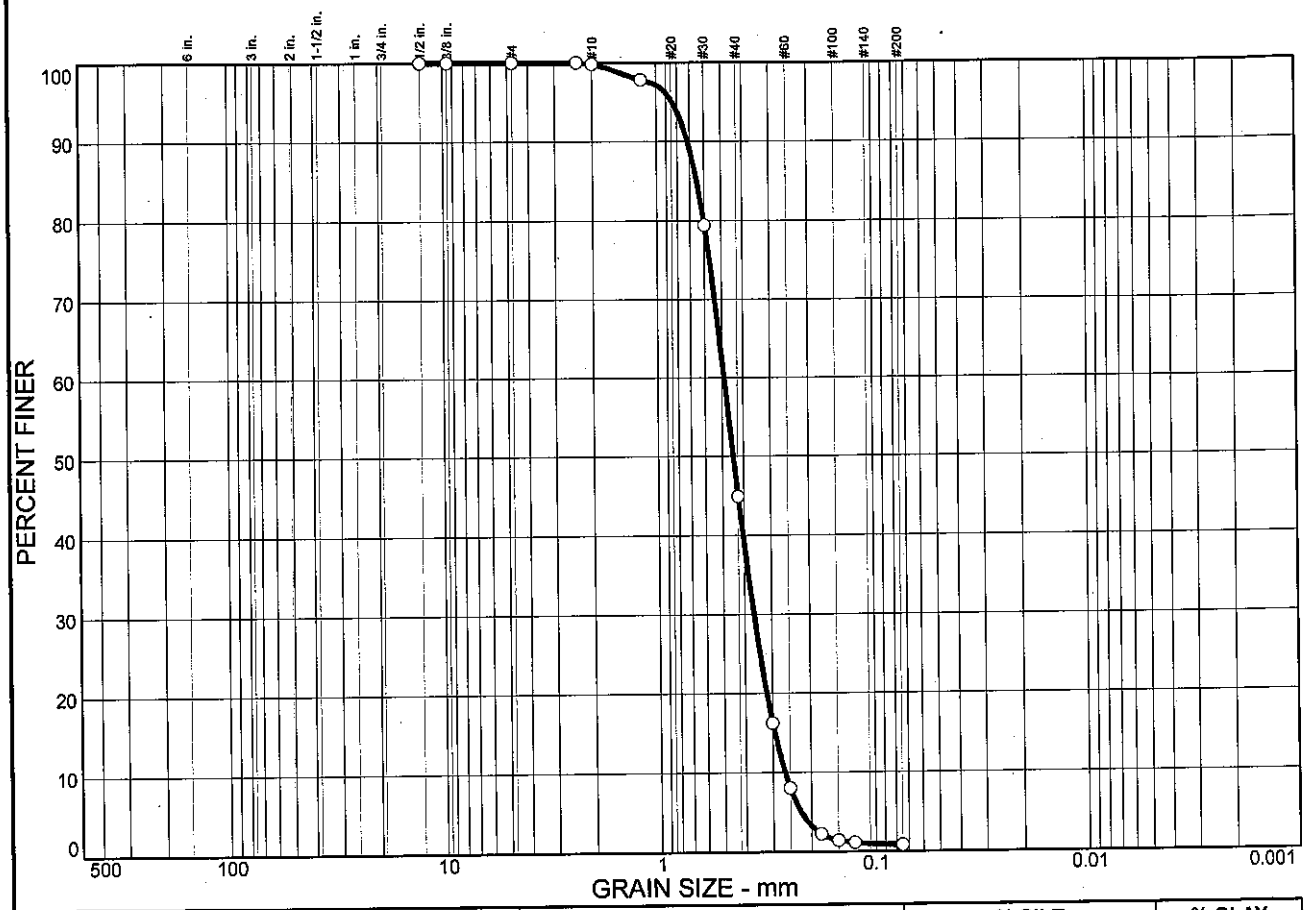
Remarks

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-3 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.2	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	99.8		
#16	97.8		
#30	79.4		
#40	44.9		
#50	16.2		
#60	8.0		
#80	2.2		
#100	1.4		
#120	1.1		
#200	0.8		

* (no specification provided)

Soil Description

Poorly graded SAND (SP)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.650 D_{60}= 0.490 D_{50}= 0.446
D_{30}= 0.363 D_{15}= 0.294 D_{10}= 0.264
C_u= 1.85 C_c= 1.02

Classification

USCS= SP AASHTO= A-1-b

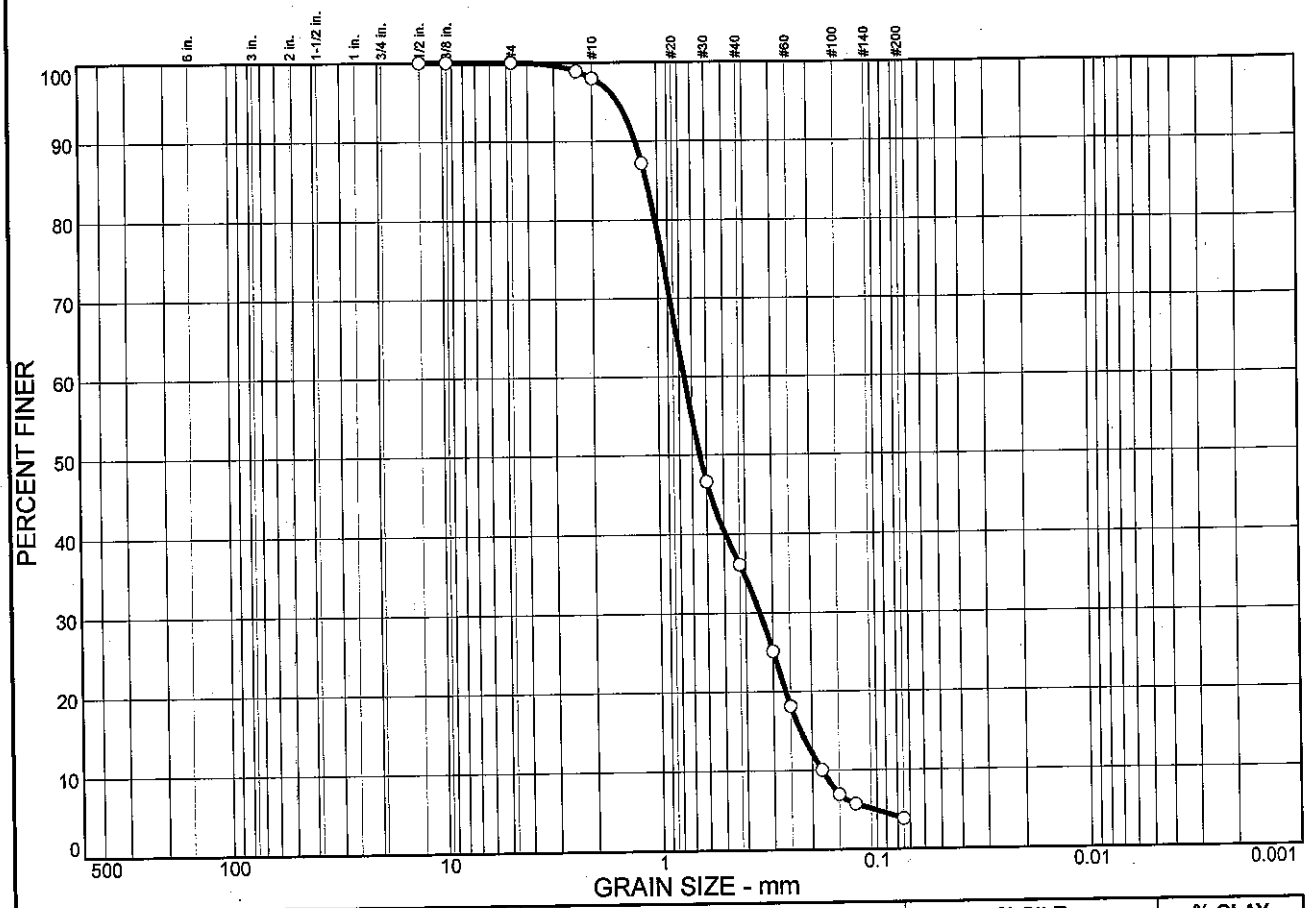
Remarks

Sample No.: S-6 **Source of Sample:** **Date:**
Location: B-3 **Elev./Depth:** 10 to 12 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	96.2	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	98.9		
#10	98.0		
#16	87.2		
#30	46.6		
#40	36.1		
#50	25.1		
#60	18.1		
#80	10.0		
#100	6.9		
#120	5.7		
#200	3.8		

* (no specification provided)

Soil Description

Poorly graded SAND (SP)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 1.13 D_{60}= 0.760 D_{50}= 0.643
D_{30}= 0.344 D_{15}= 0.226 D_{10}= 0.180
C_u= 4.22 C_c= 0.87

Classification

USCS= SP AASHTO= A-1-b

Remarks

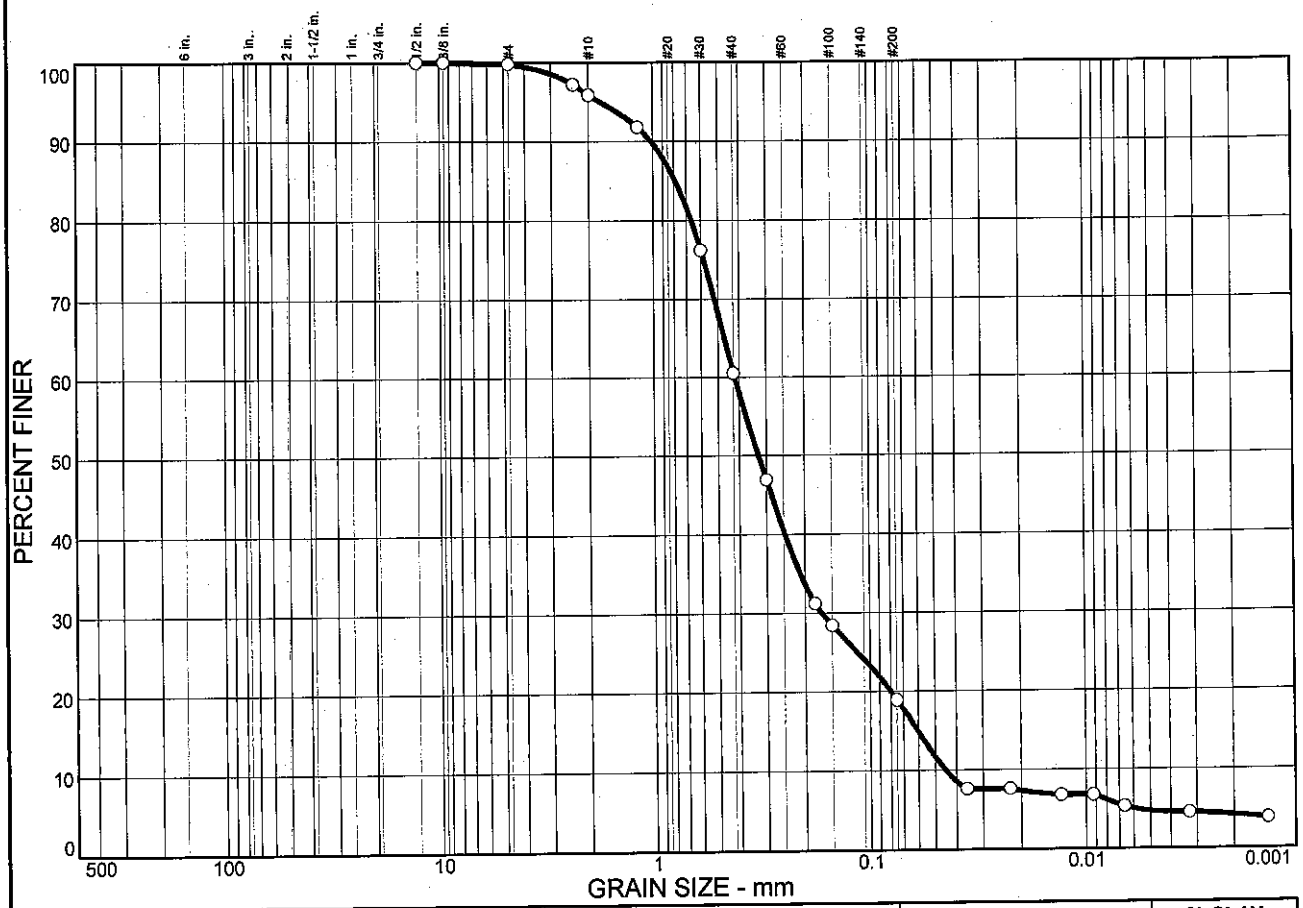
Visible marine shell fragments retained on the following sieves: #8, #10, #16, #30

Sample No.: S-11 **Source of Sample:** **Date:**
Location: B-3 **Elev./Depth:** 33 to 35 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.2	80.9	14.2	4.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	99.8		
#8	97.2		
#10	95.9		
#16	91.8		
#30	76.2		
#40	60.5		
#50	46.9		
#80	31.2		
#100	28.4		
#200	18.9		

* (no specification provided)

Soil Description

Silty SAND (SM)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.788 D_{60}= 0.420 D_{50}= 0.327
D_{30}= 0.168 D_{15}= 0.0604 D_{10}= 0.0449
C_u= 9.35 C_c= 1.50

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Visible marine shell fragments retained on the following sieves: #4, #8, #10, #16, #30, #40, #50

Sample No.: S-16
Location: B-3

Source of Sample:

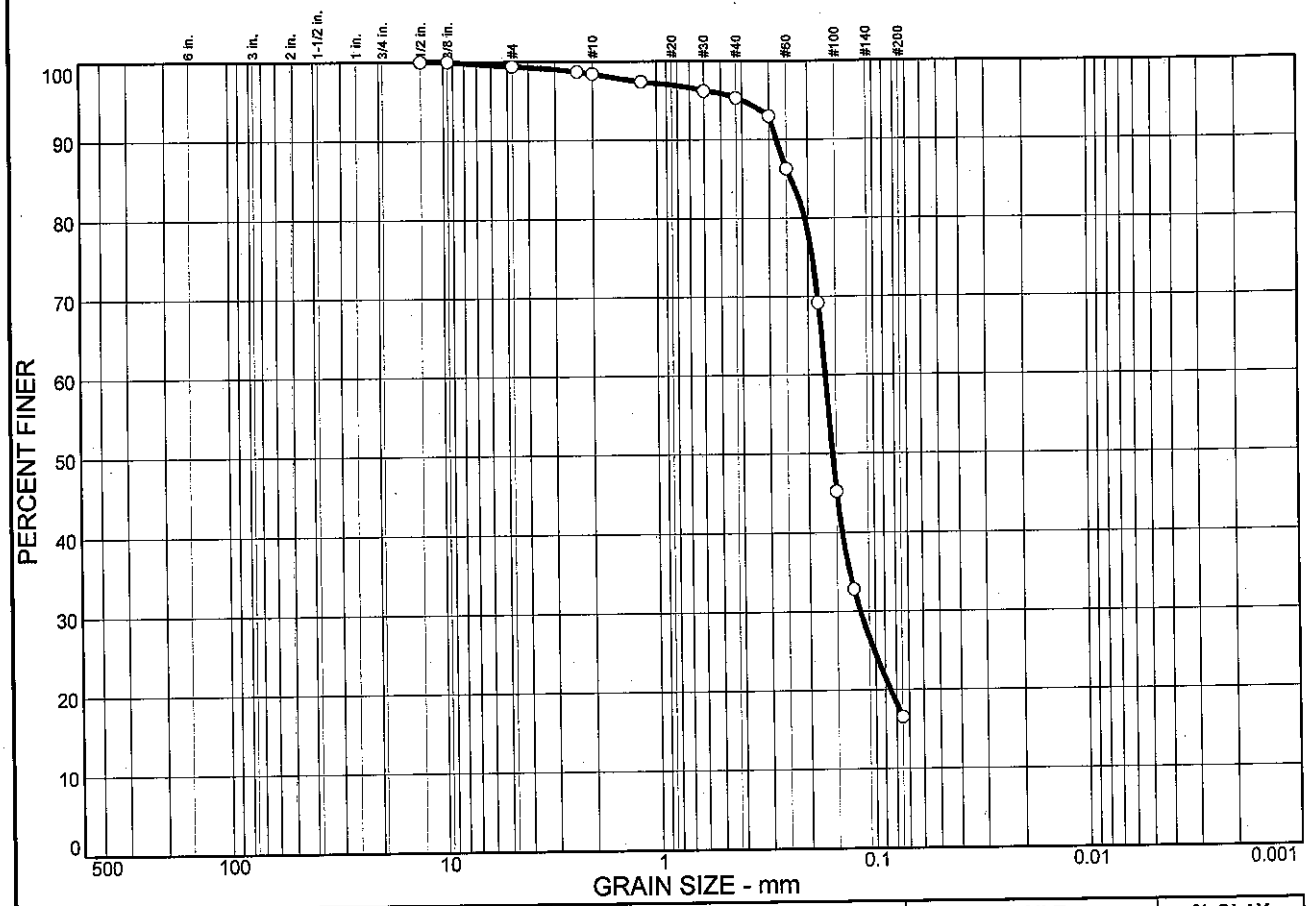
Date:
Elev./Depth: 58 to 60 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements

Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.6	82.9	16.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	99.4		
#8	98.7		
#10	98.4		
#16	97.4		
#30	96.2		
#40	95.3		
#50	93.0		
#60	86.3		
#80	69.2		
#100	45.2		
#120	32.8		
#200	16.5		

* (no specification provided)

Soil Description

Silty SAND (SM)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.239 D_{60}= 0.168 D_{50}= 0.156
D_{30}= 0.117 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Visible marine shell fragments retained on the following sieves: #4, #8, #10, #16, #30, #40, #50

Sample No.: S-21
Location: B-3

Source of Sample:

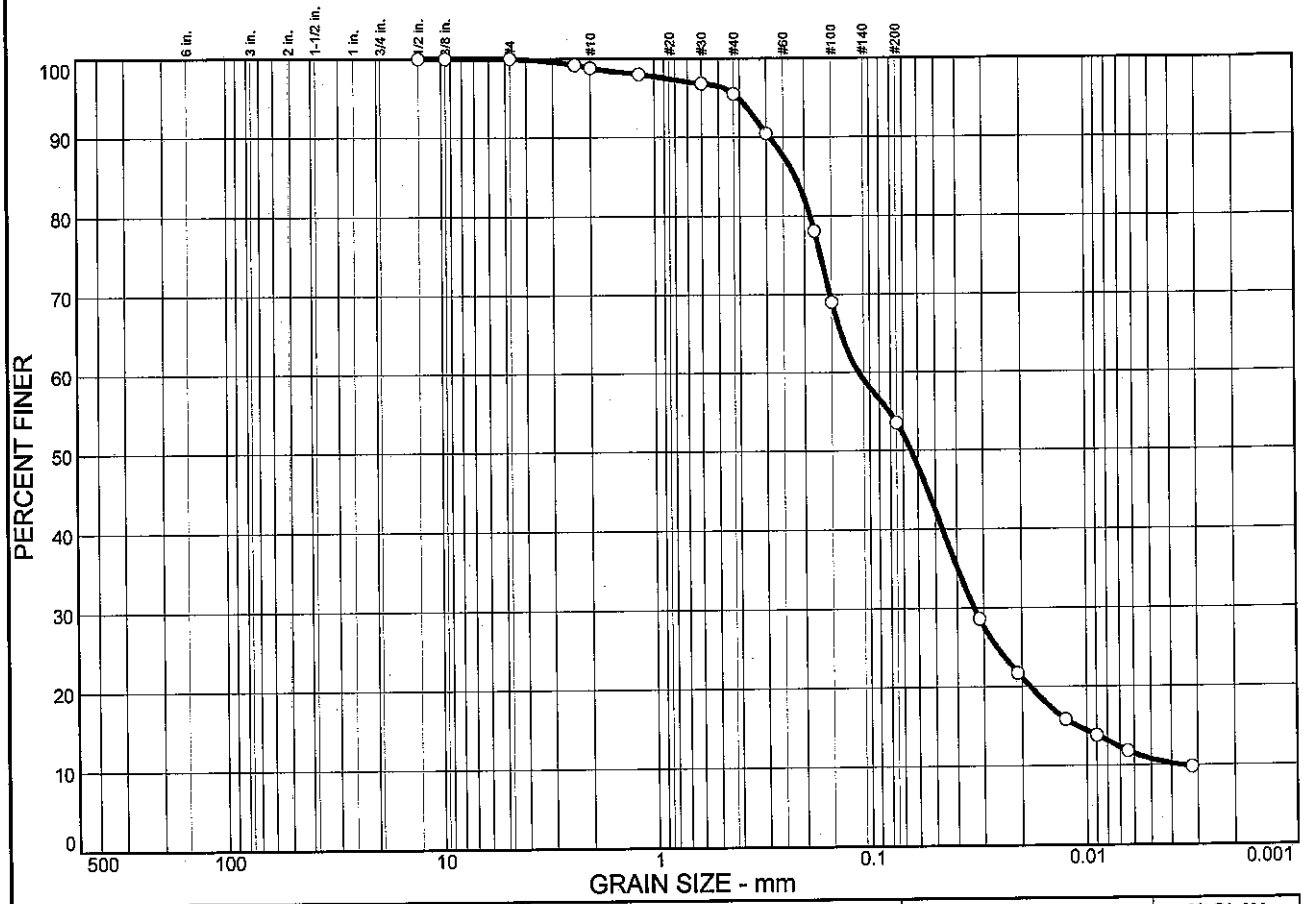
Date:
Elev./Depth: 83 to 85 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements

Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	46.5	42.7	10.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	99.2		
#10	98.8		
#16	98.0		
#30	96.8		
#40	95.5		
#50	90.5		
#80	78.1		
#100	69.0		
#200	53.5		

* (no specification provided)

Soil Description

Sandy SILT (ML)

Atterberg Limits

PL= NT LL= NT PI= NT

Coefficients

D_{85}= 0.220 D_{60}= 0.112 D_{50}= 0.0646
D_{30}= 0.0333 D_{15}= 0.0112 D_{10}= 0.0036
C_u= 31.29 C_c= 2.76

Classification

USCS= ML AASHTO= A-4(0)

Remarks

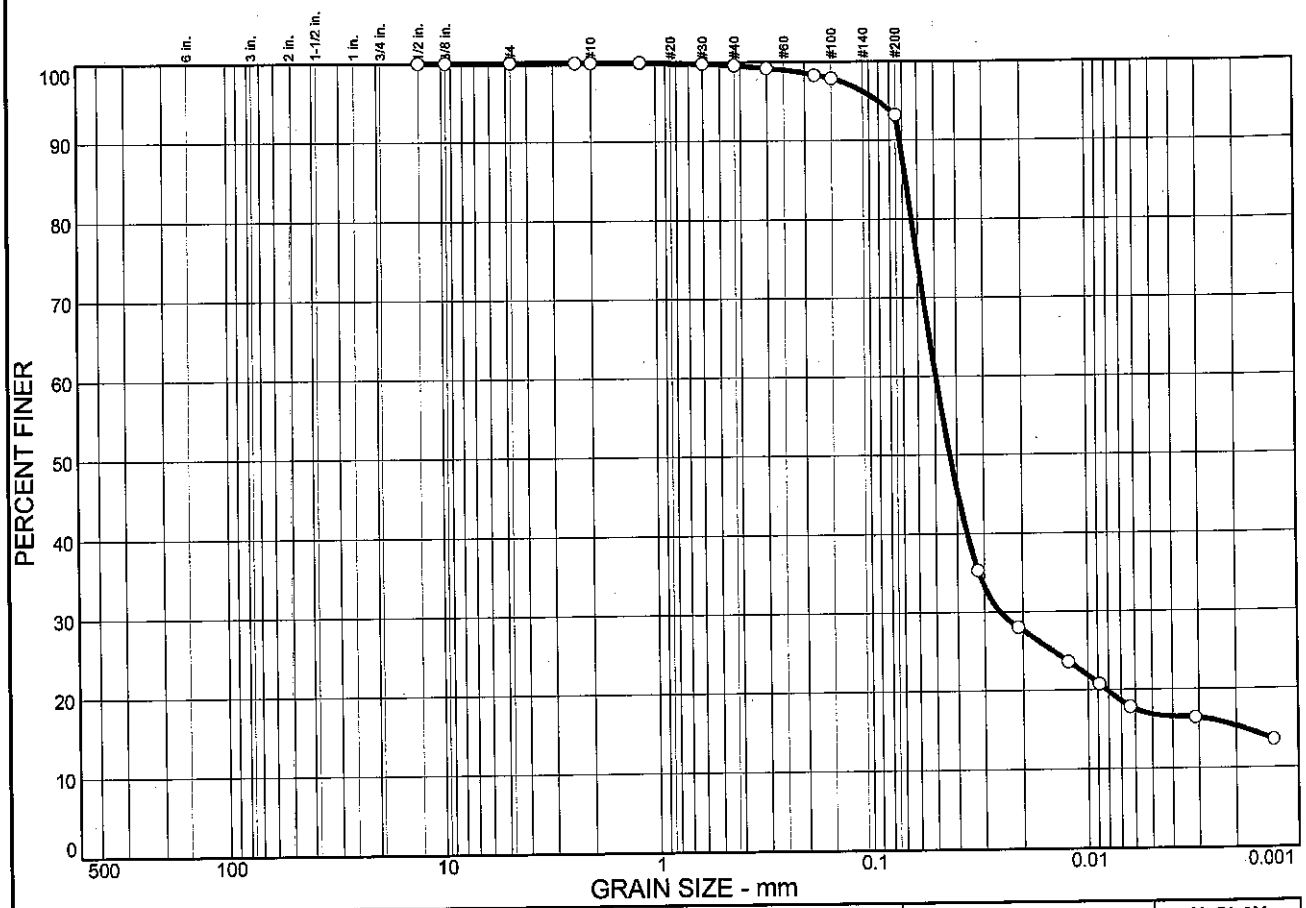
Visible marine shell fragments retained on the following sieves: #8, #10, #16, #30, #40

Sample No.: S-23 **Source of Sample:** **Date:**
Location: B-3 **Elev./Depth:** 93 to 95 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	6.8	76.4	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	99.8		
#40	99.6		
#50	99.2		
#80	98.3		
#100	97.9		
#200	93.2		

* (no specification provided)

Soil Description

Fat CLAY (CH)

Atterberg Limits

PL= 22 LL= 58 PI= 36

Coefficients

D_{85}= 0.0680 D_{60}= 0.0497 D_{50}= 0.0430
D_{30}= 0.0256 D_{15}= 0.0019 D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(37)

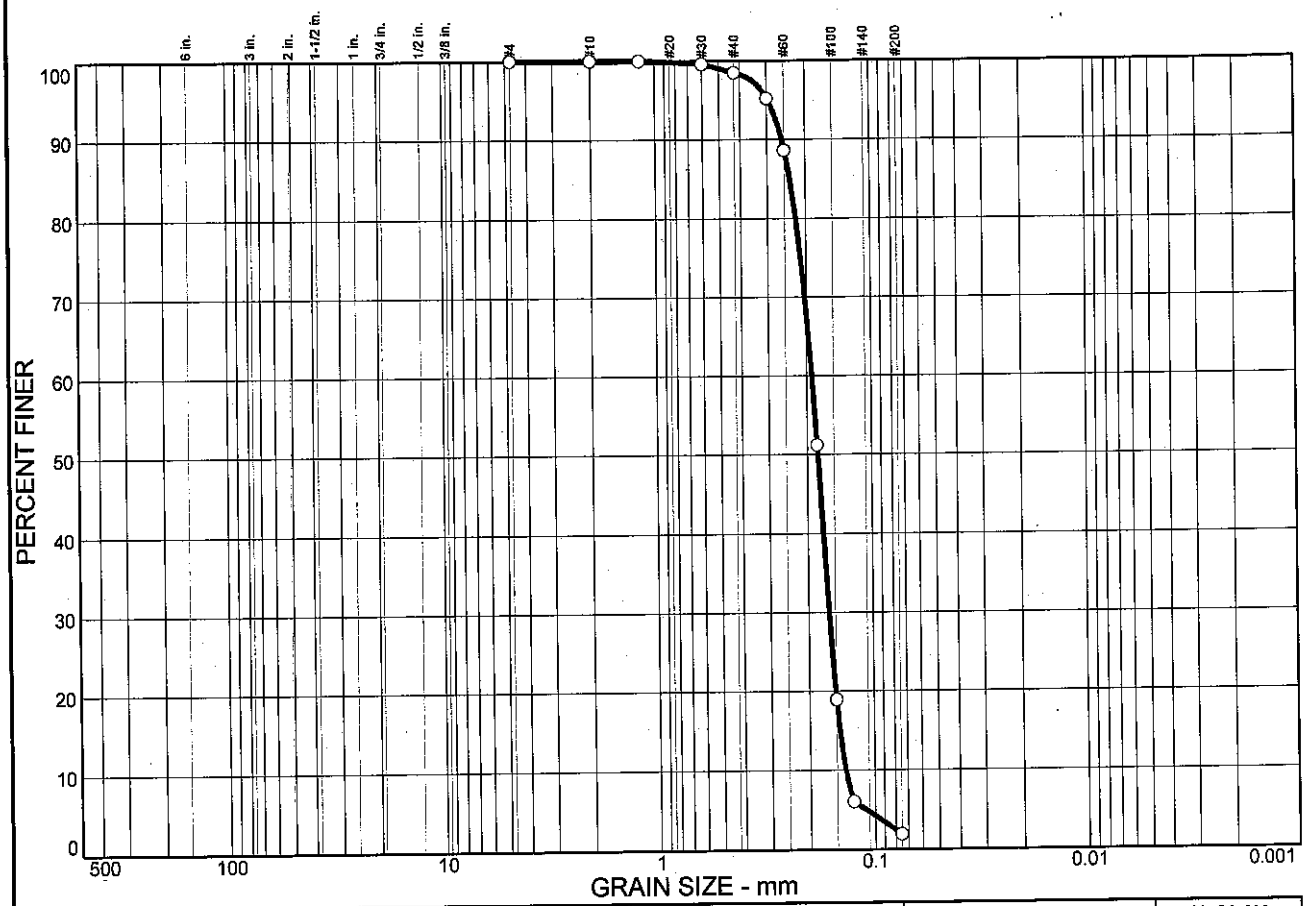
Remarks

Sample No.: S-24 **Source of Sample:** **Date:**
Location: B-3 **Elev./Depth:** 98 to 100 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.1	1.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	100.0		
#30	99.6		
#40	98.5		
#50	95.2		
#60	88.6		
#80	51.2		
#100	18.9		
#120	6.0		
#200	1.9		

* (no specification provided)

Soil Description

Poorly graded fine SAND (SP) with trace medium Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.237 D_{60}= 0.190 D_{50}= 0.179
D_{30}= 0.161 D_{15}= 0.145 D_{10}= 0.137
C_u= 1.39 C_c= 1.00

Classification

USCS= SP AASHTO= A-3

Remarks

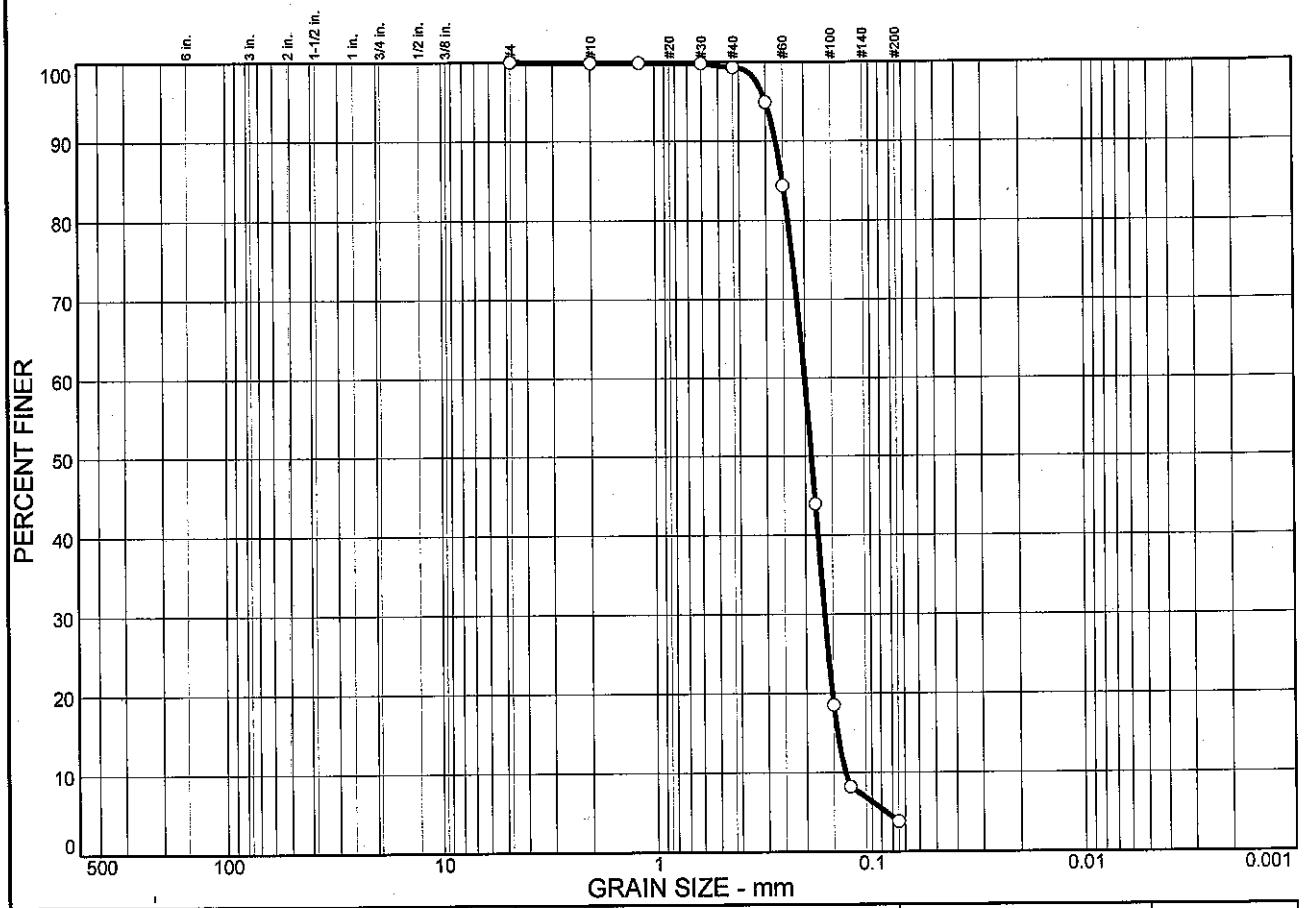
B-5
S-5

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-5 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	96.2	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#16	99.9		
#30	99.8		
#40	99.3		
#50	94.9		
#60	84.4		
#80	43.9		
#100	18.5		
#120	8.2		
#200	3.8		

* (no specification provided)

Soil Description

Poorly graded fine SAND (SP) with trace medium Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.252 D_{60}= 0.201 D_{50}= 0.187
D_{30}= 0.164 D_{15}= 0.144 D_{10}= 0.132
C_u= 1.52 C_c= 1.02

Classification

USCS= SP AASHTO= A-3

Remarks

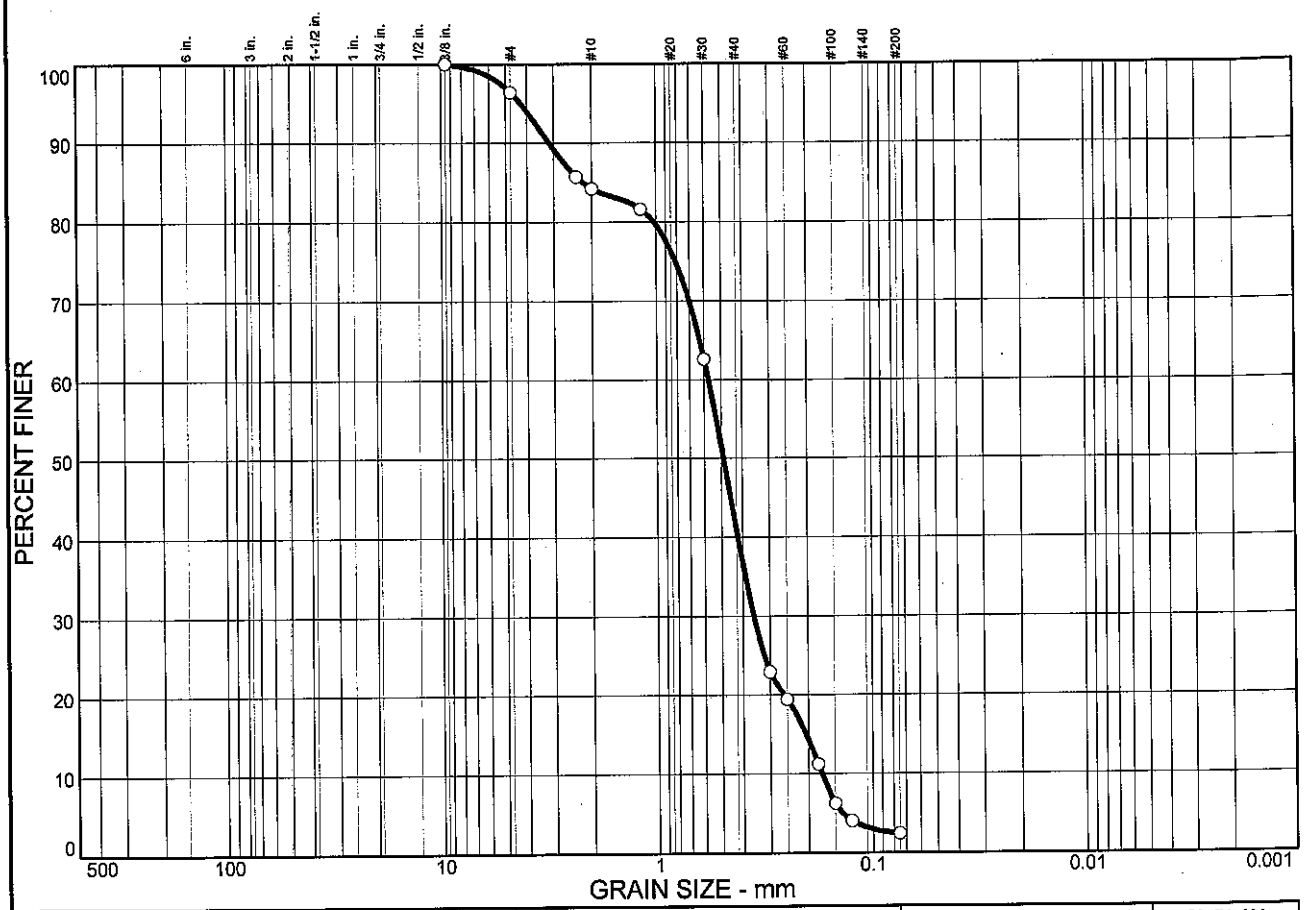
B-5
S-8

Sample No.: S-8 **Source of Sample:** **Date:**
Location: B-5 **Elev./Depth:** 14 to 16 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.6	94.0	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	96.4		
#8	85.7		
#10	84.2		
#16	81.6		
#30	62.6		
#50	22.9		
#60	19.4		
#80	11.2		
#100	6.2		
#120	4.0		
#200	2.4		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP) with coarse Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.21 D_{60}= 0.573 D_{50}= 0.490
D_{30}= 0.356 D_{15}= 0.206 D_{10}= 0.173
C_u= 3.31 C_c= 1.28

Classification

USCS= SP AASHTO= A-1-b

Remarks

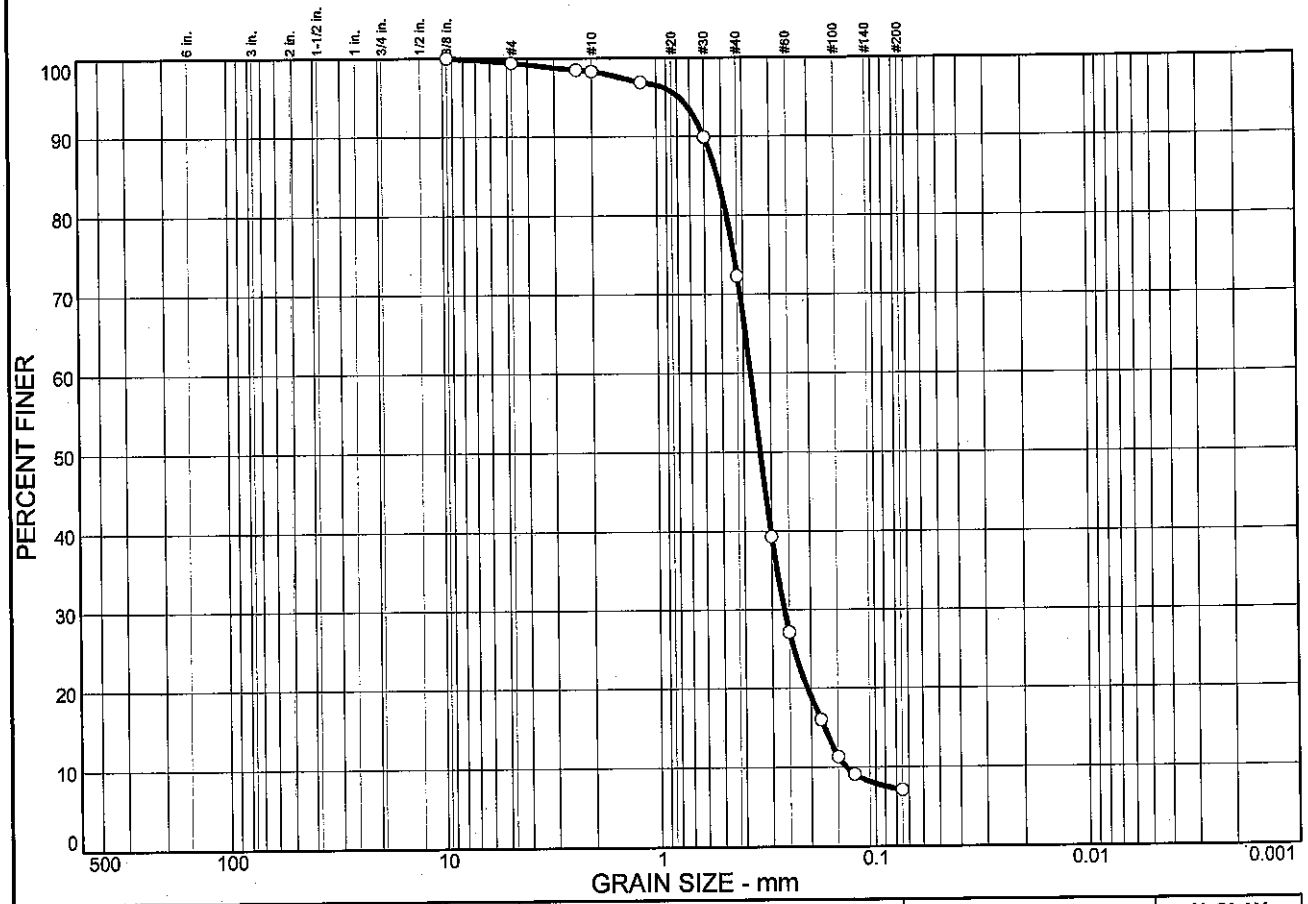
B-5
S-12

Sample No.: S-12 **Source of Sample:** **Date:**
Location: B-5 **Elev./Depth:** 23 to 25 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.6	92.3	7.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.4		
#8	98.5		
#10	98.3		
#16	96.9		
#30	89.9		
#40	72.3		
#50	39.3		
#60	27.1		
#80	16.0		
#100	11.3		
#120	9.1		
#200	7.1		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM) with Silt and trace coarse Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.523 D_{60}= 0.372 D_{50}= 0.337
D_{30}= 0.264 D_{15}= 0.174 D_{10}= 0.138
C_u= 2.70 C_c= 1.35

Classification

USCS= SP-SM AASHTO= A-3

Remarks

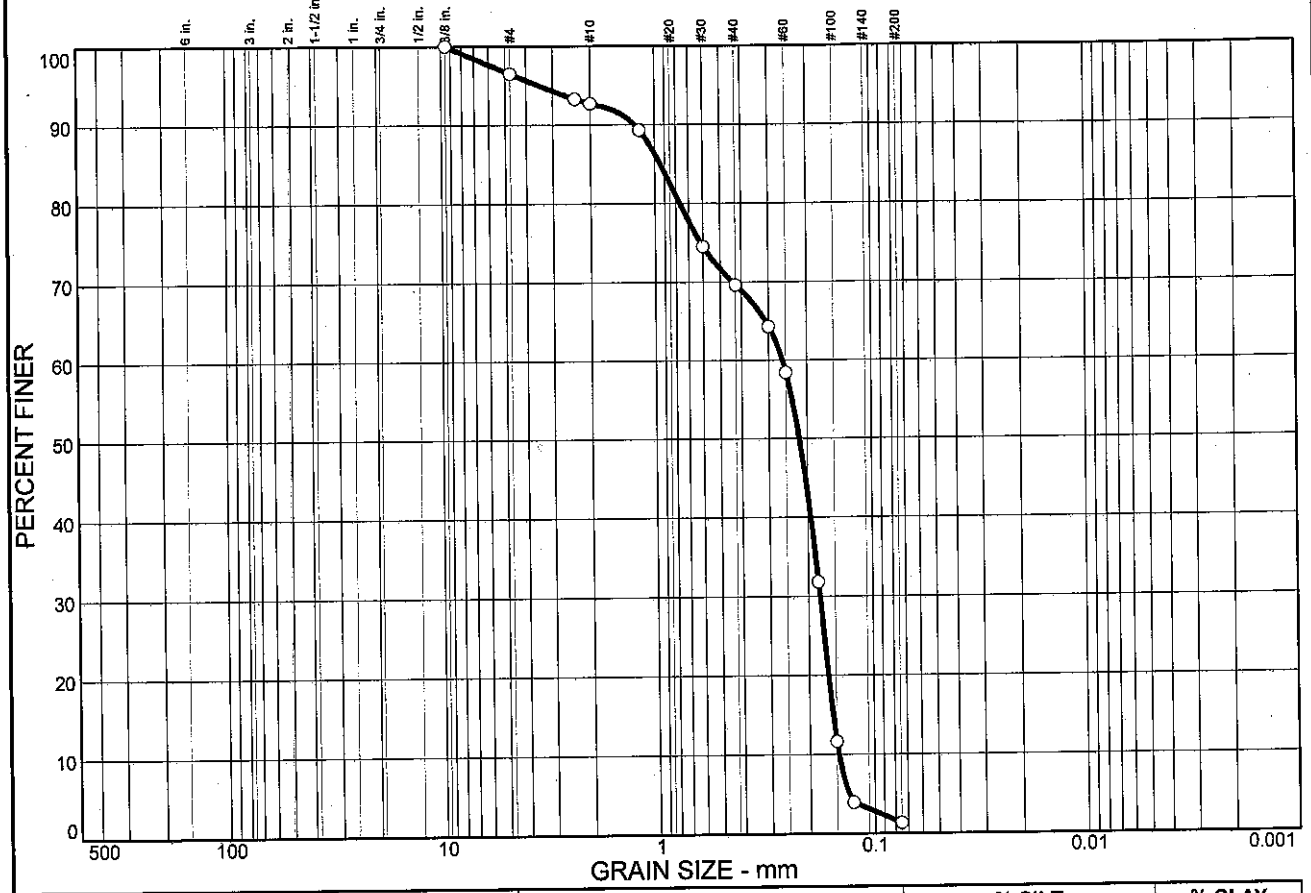
B-6
S-4

Sample No.: S-4 **Source of Sample:** **Date:**
Location: B-6 **Elev./Depth:** 6 to 8 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.5	95.2	1.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	96.5		
#8	93.3		
#10	92.7		
#16	89.3		
#30	74.5		
#40	69.6		
#50	64.3		
#60	58.4		
#80	31.8		
#100	11.6		
#120	3.9		
#200	1.3		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM) with Silt and trace coarse Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.945 D_{60}= 0.259 D_{50}= 0.218
D_{30}= 0.177 D_{15}= 0.156 D_{10}= 0.147
C_u= 1.77 C_c= 0.82

Classification

USCS= SP AASHTO= A-3

Remarks

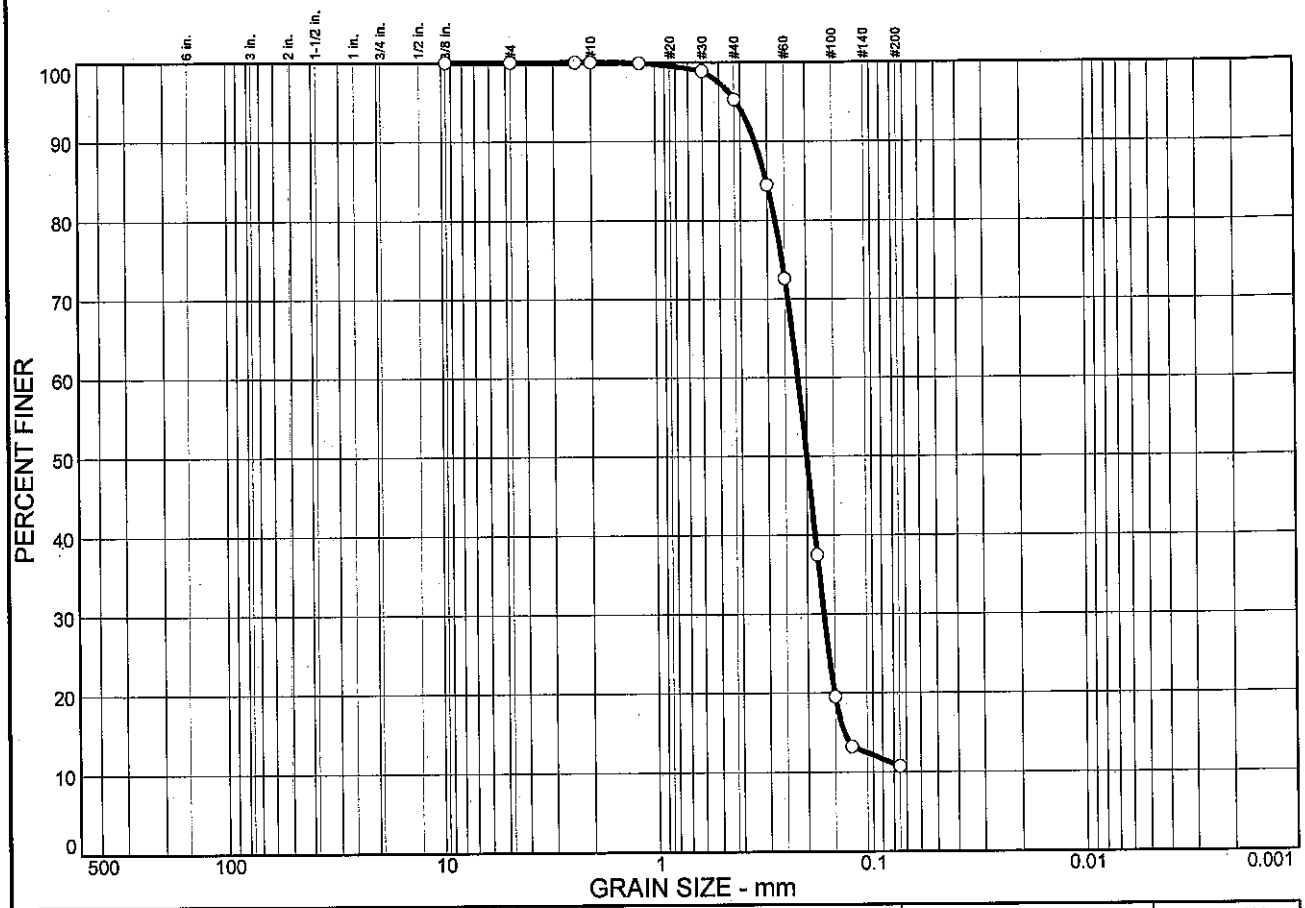
B-7
S-10

Sample No.: S-10 (Bottom)) **Source of Sample:** **Date:**
Location: B-7 **Elev./Depth:** 18.5 to 20

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	89.3	10.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.9		
#30	98.9		
#40	95.3		
#50	84.5		
#60	72.6		
#80	37.5		
#100	19.5		
#120	13.2		
#200	10.7		

* (no specification provided)

Soil Description

Poorly graded fine SAND (SP-SM) with Silt and trace medium Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.303 D_{60}= 0.219 D_{50}= 0.200
D_{30}= 0.168 D_{15}= 0.136 D_{10}=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4(0)

Remarks

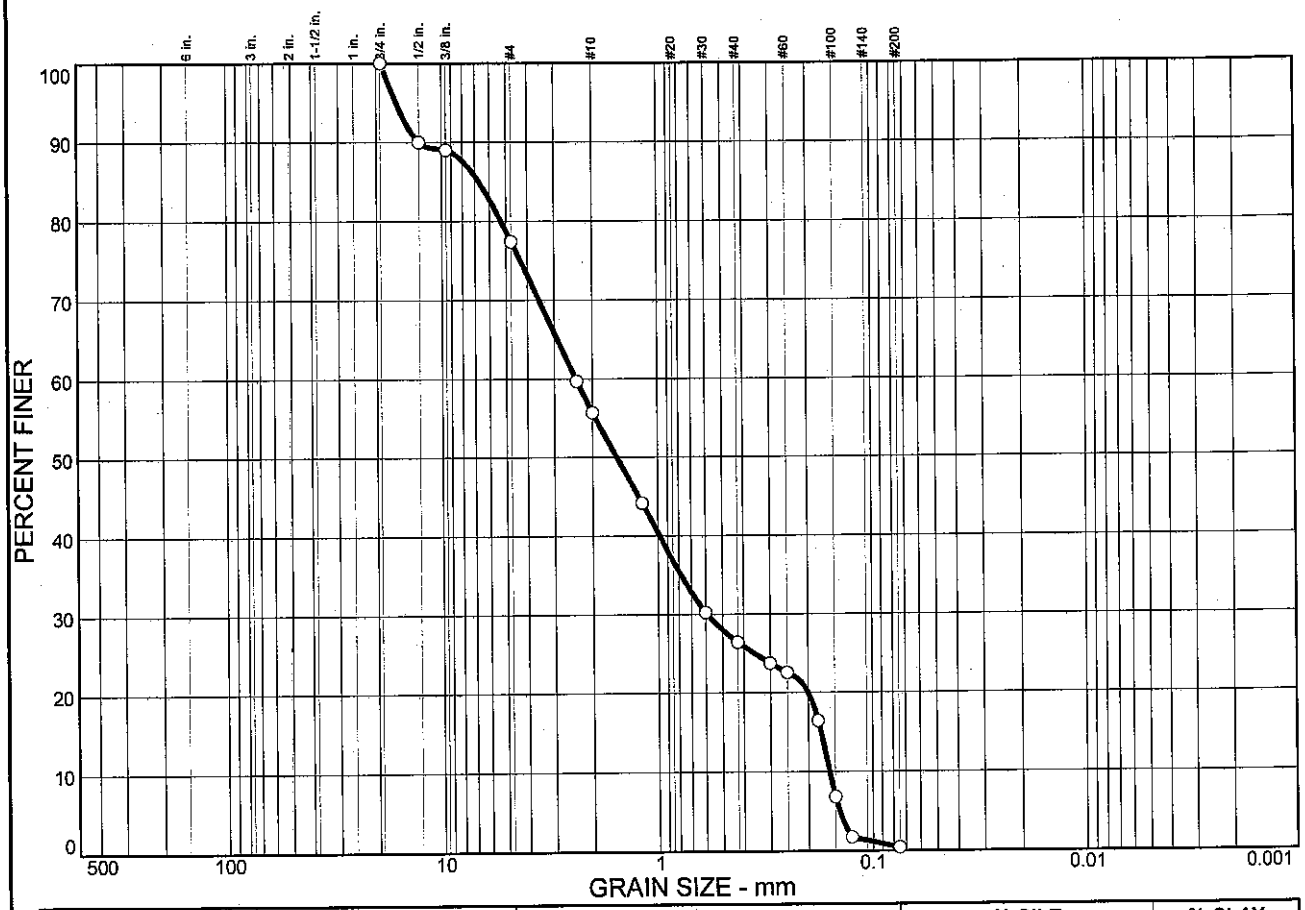
B-8
S-4

Sample No.: S-4 **Source of Sample:** **Date:**
Location: B-8 **Elev./Depth:** 6 to 8 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	22.6	77.0	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
0.5 in.	90.0		
.375 in.	89.0		
#4	77.4		
#8	59.7		
#10	55.7		
#16	44.1		
#30	30.2		
#40	26.4		
#50	23.7		
#60	22.5		
#80	16.4		
#100	6.8		
#120	1.7		
#200	0.4		

* (no specification provided)

Soil Description

Poorly graded fine to coarse SAND (SP) with trace fine Stone

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.72 D_{60}= 2.39 D_{50}= 1.55
D_{30}= 0.592 D_{15}= 0.175 D_{10}= 0.160
C_u= 14.96 C_c= 0.92

Classification

USCS= SP AASHTO= A-1-b

Remarks

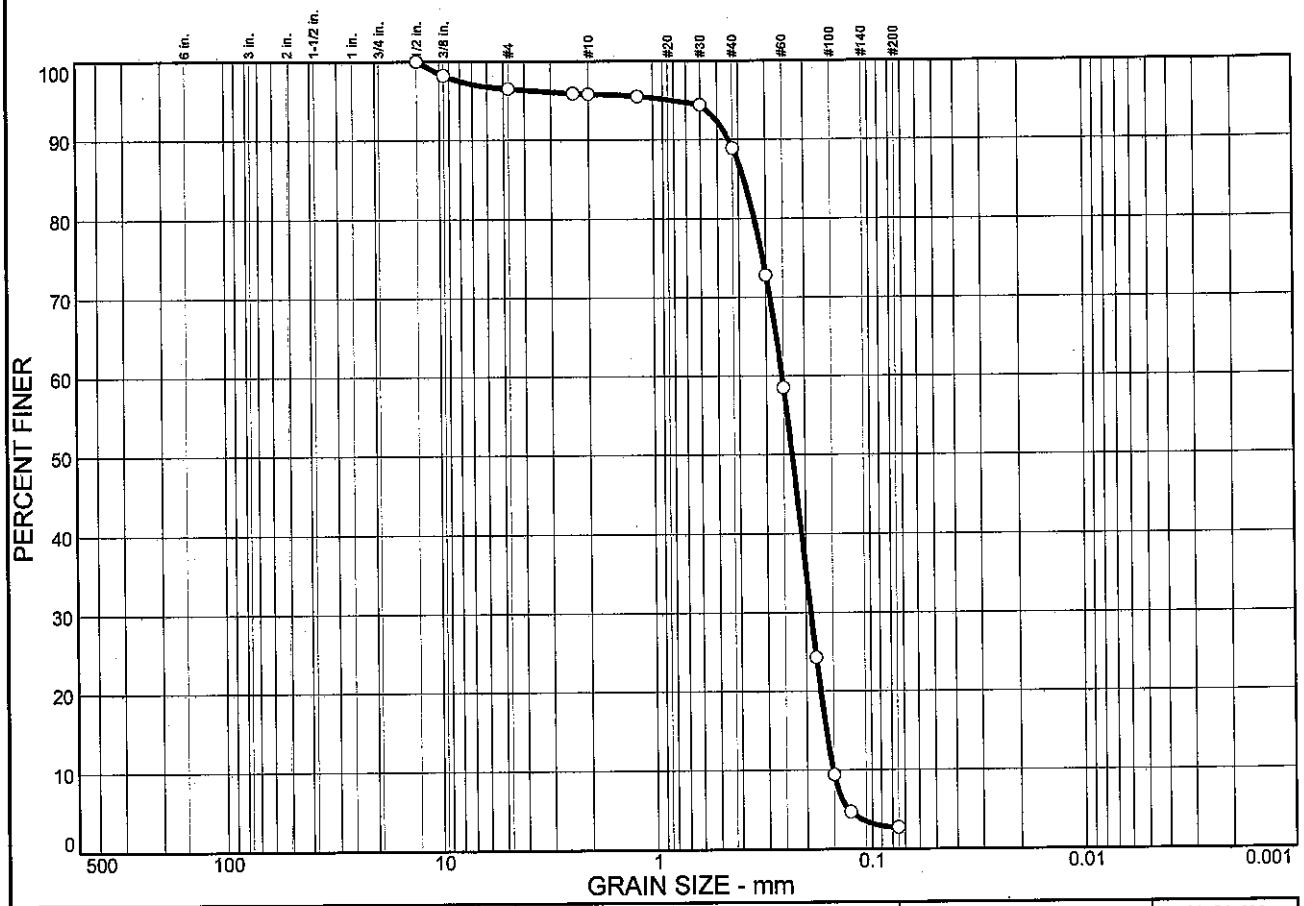
B-8
S-11

Sample No.: S-11 (Top) **Source of Sample:** **Date:**
Location: B-8 **Elev./Depth:** 23 to 24.5

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.5	93.8	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.2		
#4	96.5		
#8	95.9		
#10	95.8		
#16	95.5		
#30	94.4		
#40	88.9		
#50	72.8		
#60	58.5		
#80	24.3		
#100	9.4		
#120	4.7		
#200	2.7		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP) with trace coarse Sand and trace fine Stone

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.378 D_{60}= 0.254 D_{50}= 0.229
D_{30}= 0.190 D_{15}= 0.163 D_{10}= 0.152
C_u= 1.68 C_c= 0.94

Classification

USCS= SP AASHTO= A-3

Remarks

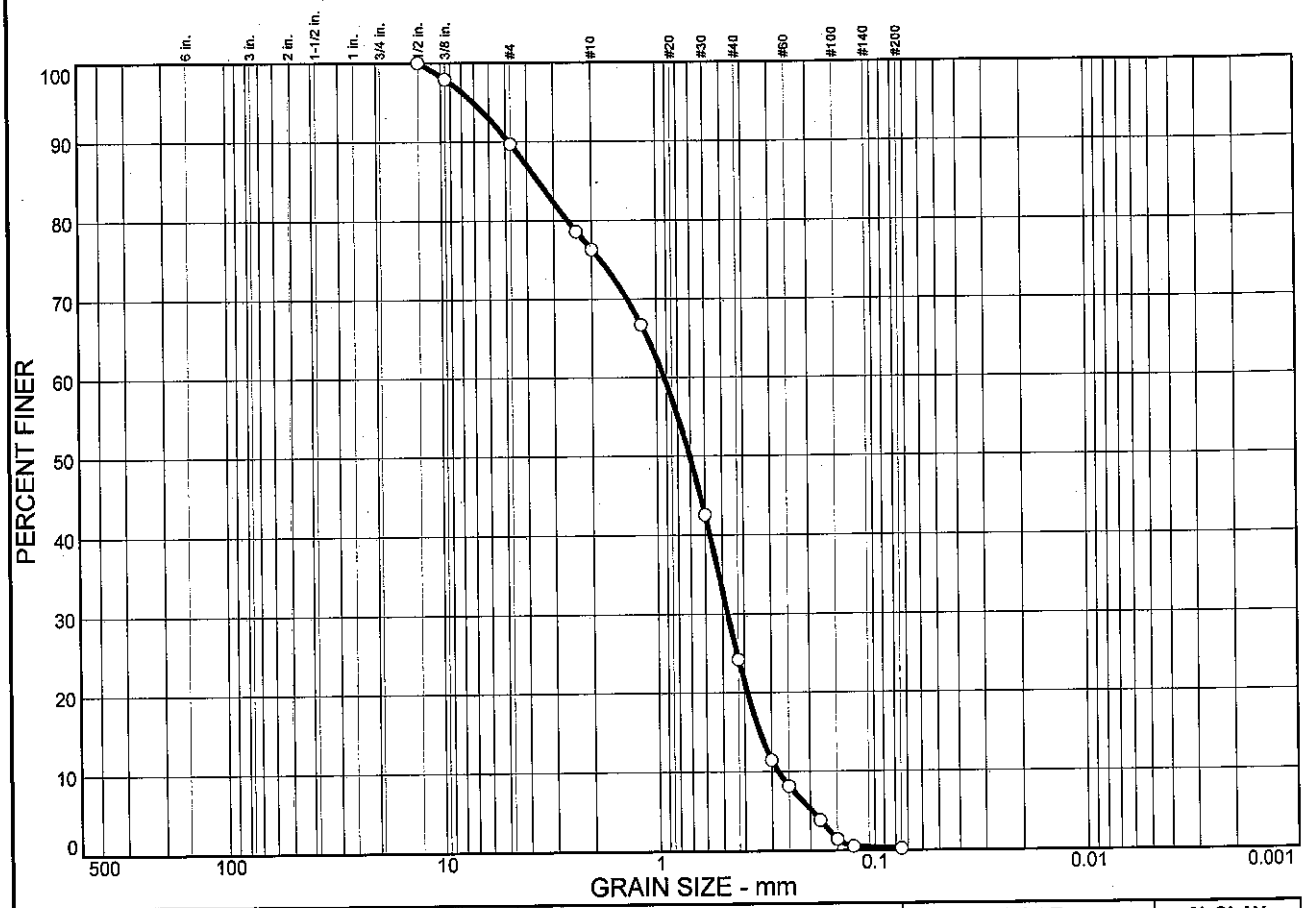
B-9
S-5

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-9 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.3	89.5	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	97.9		
#4	89.7		
#8	78.6		
#10	76.3		
#16	66.7		
#30	42.5		
#40	24.2		
#50	11.4		
#60	8.1		
#80	3.8		
#100	1.4		
#120	0.5		
#200	0.2		

* (no specification provided)

Soil Description

Poorly graded fine to coarse SAND (SP) with little fine Stone

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.54 D_{60}= 0.924 D_{50}= 0.705
D_{30}= 0.476 D_{15}= 0.340 D_{10}= 0.281
C_u= 3.29 C_c= 0.87

Classification

USCS= SP AASHTO= A-1-b

Remarks

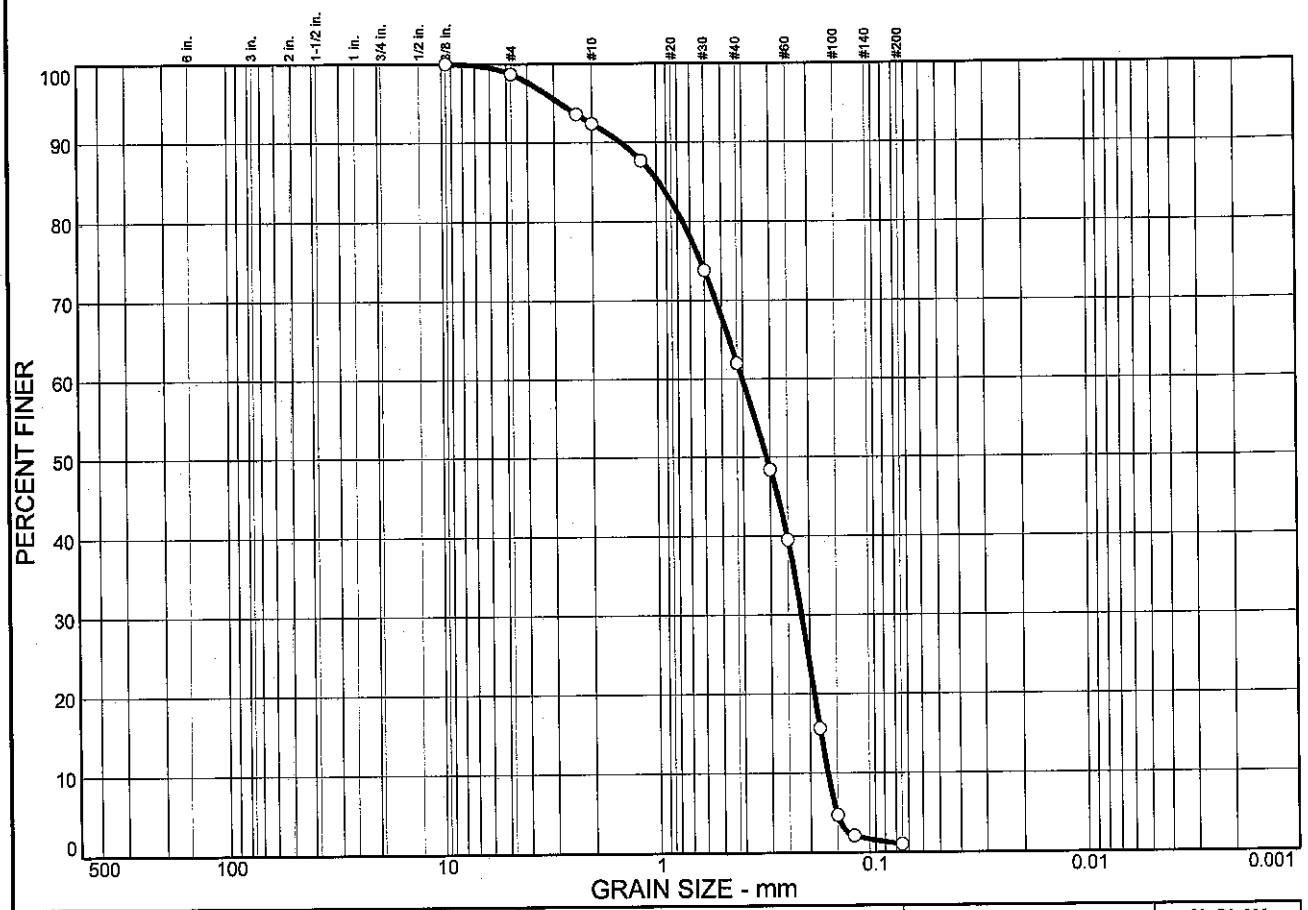
B-9
S-10

Sample No.: S-10 **Source of Sample:** **Date:**
Location: B-9 **Elev./Depth:** 18 to 20 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.3	97.7	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.7		
#8	93.6		
#10	92.4		
#16	87.7		
#30	73.8		
#40	62.0		
#50	48.4		
#60	39.5		
#80	15.6		
#100	4.7		
#120	2.1		
#200	1.0		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP) with trace coarse Sand and trace fine Stone

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.978 D_{60}= 0.403 D_{50}= 0.312
D_{30}= 0.217 D_{15}= 0.179 D_{10}= 0.166
C_u= 2.42 C_c= 0.71

Classification

USCS= SP AASHTO= A-3

Remarks

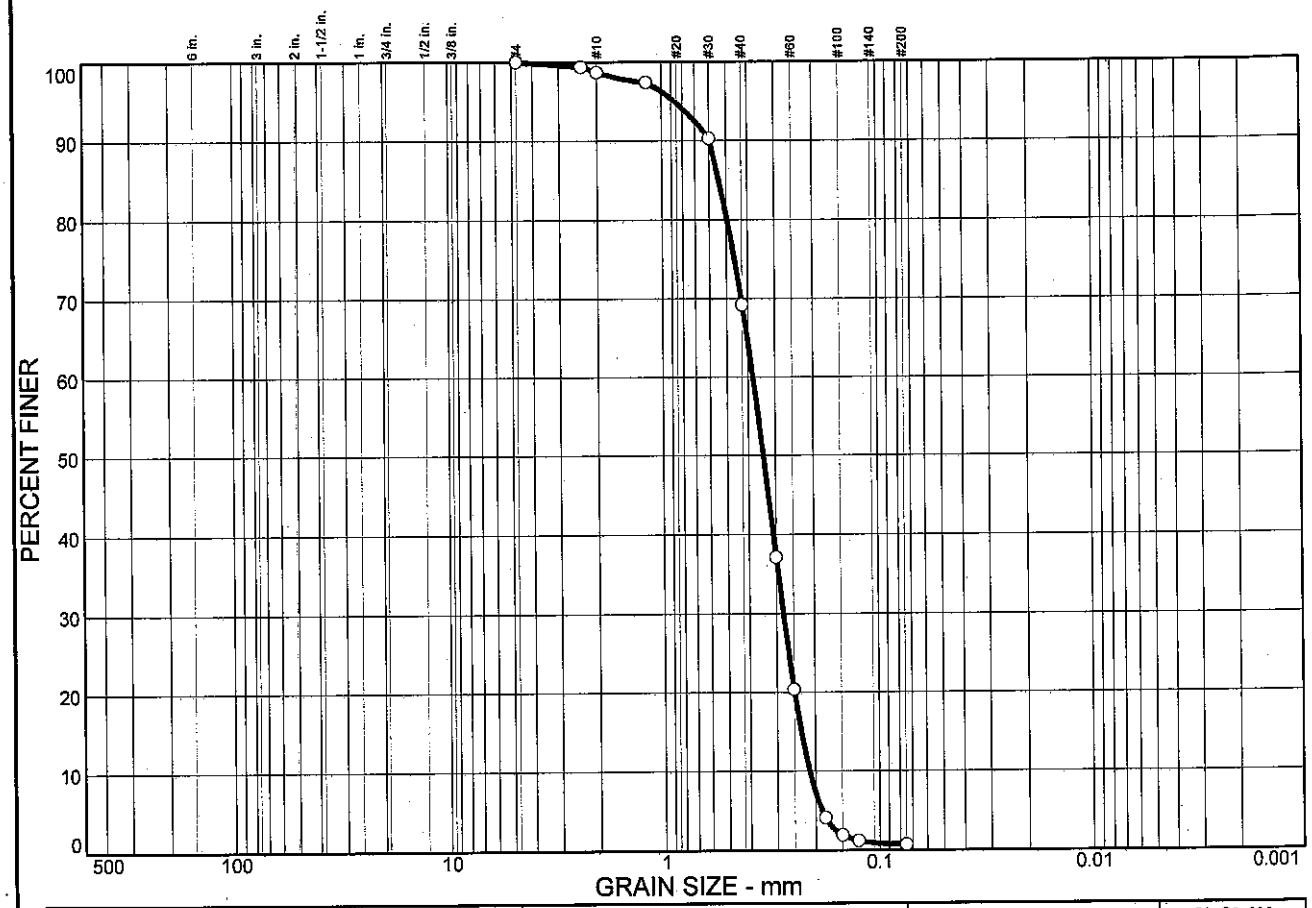
B-10
S-8

Sample No.: S-8 **Source of Sample:** **Date:**
Location: B-10 **Elev./Depth:** 14 to 16 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.3	0.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.4		
#10	98.7		
#16	97.4		
#30	90.3		
#40	69.2		
#50	37.1		
#60	20.3		
#80	4.1		
#100	1.9		
#120	1.2		
#200	0.7		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP) with trace coarse Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.543 D_{60}= 0.381 D_{50}= 0.342
D_{30}= 0.279 D_{15}= 0.232 D_{10}= 0.213
C_u= 1.79 C_c= 0.96

Classification

USCS= SP AASHTO= A-3

Remarks

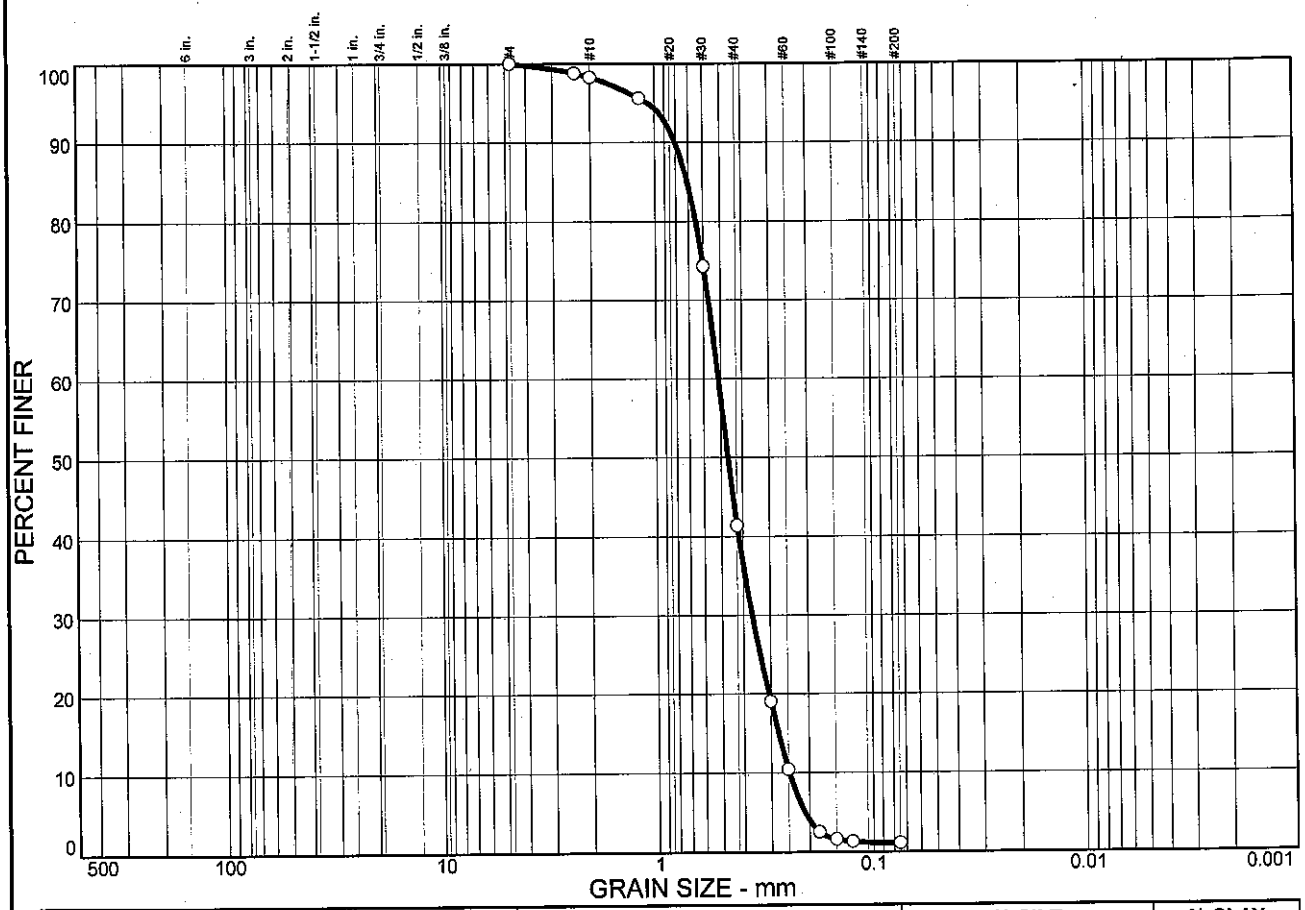
B-11
S-5

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-11 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.9	1.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	98.8		
#10	98.3		
#16	95.6		
#30	74.3		
#40	41.4		
#50	19.0		
#60	10.4		
#80	2.5		
#100	1.6		
#120	1.3		
#200	1.1		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP) with trace coarse Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.709 D_{60}= 0.515 D_{50}= 0.466
D_{30}= 0.365 D_{15}= 0.277 D_{10}= 0.247
C_u= 2.08 C_c= 1.04

Classification

USCS= SP AASHTO= A-1-b

Remarks

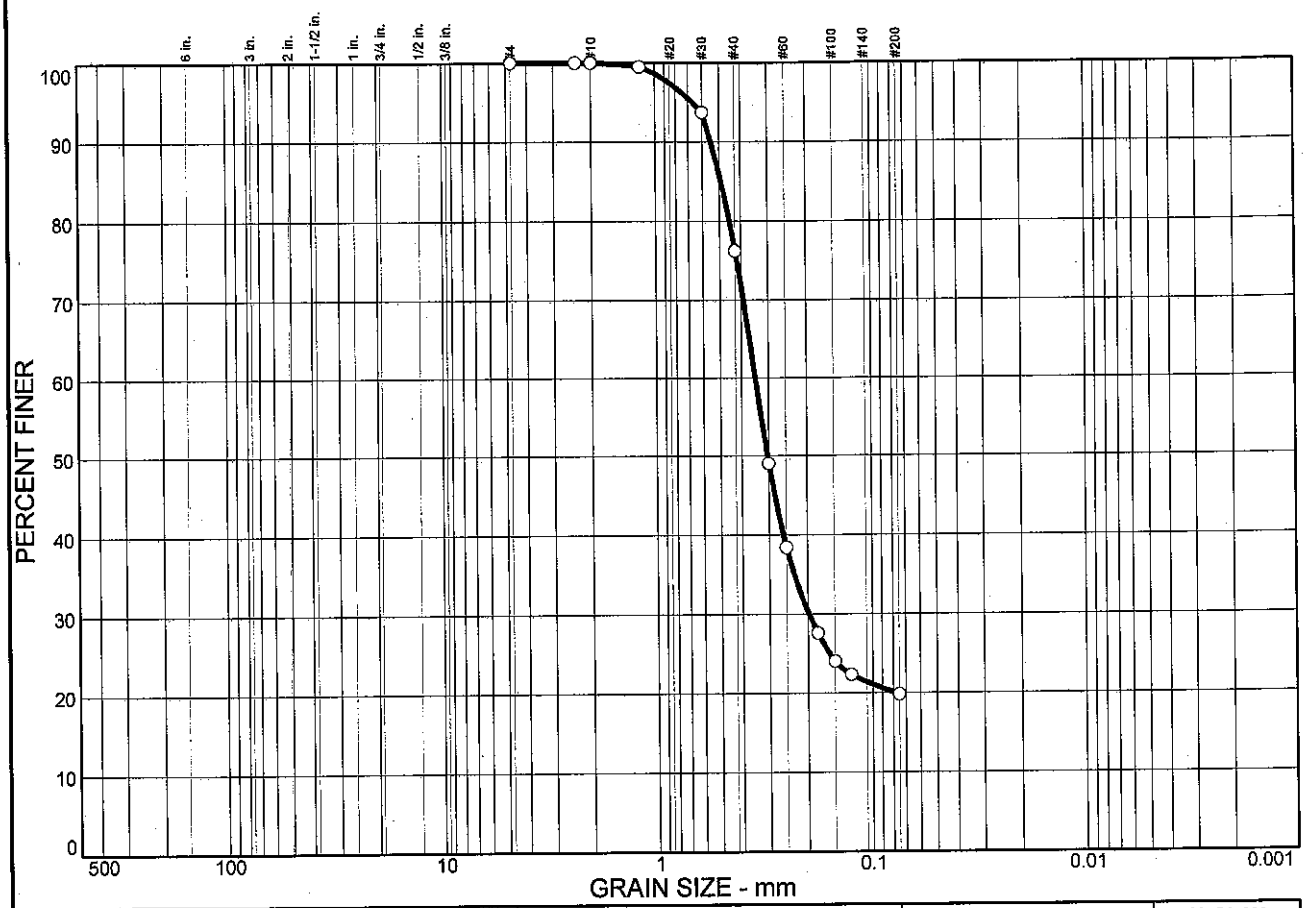
B-11
S-7

Sample No.: S-7 **Source of Sample:** **Date:**
Location: B-11 **Elev./Depth:** 12 to 14 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	80.2	19.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.5		
#30	93.7		
#40	76.2		
#50	49.0		
#60	38.4		
#80	27.6		
#100	24.0		
#120	22.3		
#200	19.8		

* (no specification provided)

Soil Description

Silty fine to medium SAND (SM)
Organic Content = 0.9%

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.493 D_{60}= 0.346 D_{50}= 0.304
D_{30}= 0.198 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

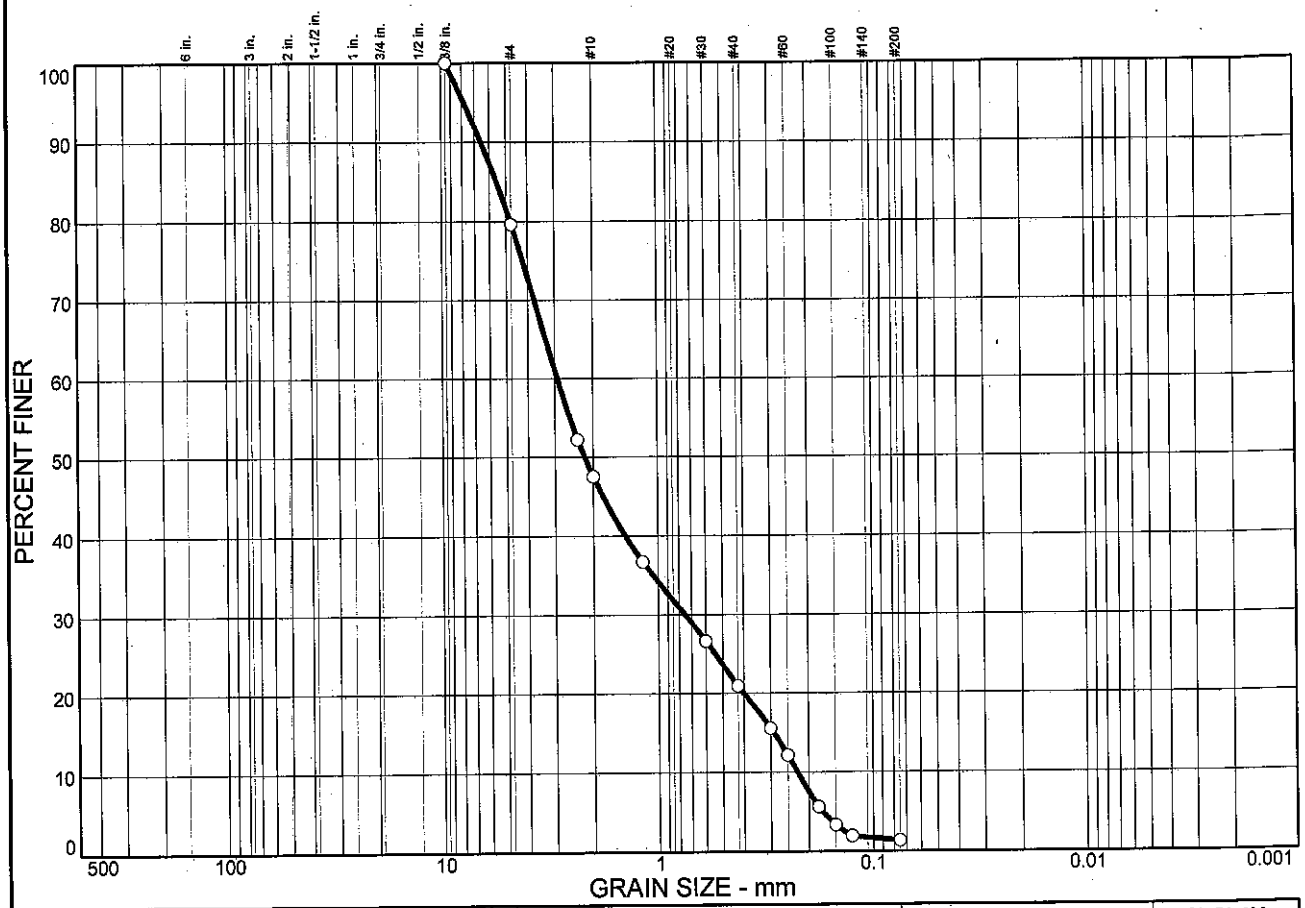
B-12
S-2
Organic Content = 0.9%

Sample No.: S-2 (Bottom) **Source of Sample:** **Date:**
Location: B-12 **Elev./Depth:** 2.5 to 4 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	20.4	78.3	1.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	79.6		
#8	52.2		
#10	47.5		
#16	36.7		
#30	26.6		
#40	20.9		
#50	15.5		
#60	12.1		
#80	5.6		
#100	3.3		
#120	1.9		
#200	1.3		

* (no specification provided)

Soil Description

Poorly graded fine to coarse SAND (SP) with fine Stone

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 5.55 D_{60}= 2.93 D_{50}= 2.19
D_{30}= 0.752 D_{15}= 0.291 D_{10}= 0.226
C_u= 12.96 C_c= 0.85

Classification

USCS= SP AASHTO= A-1-a

Remarks

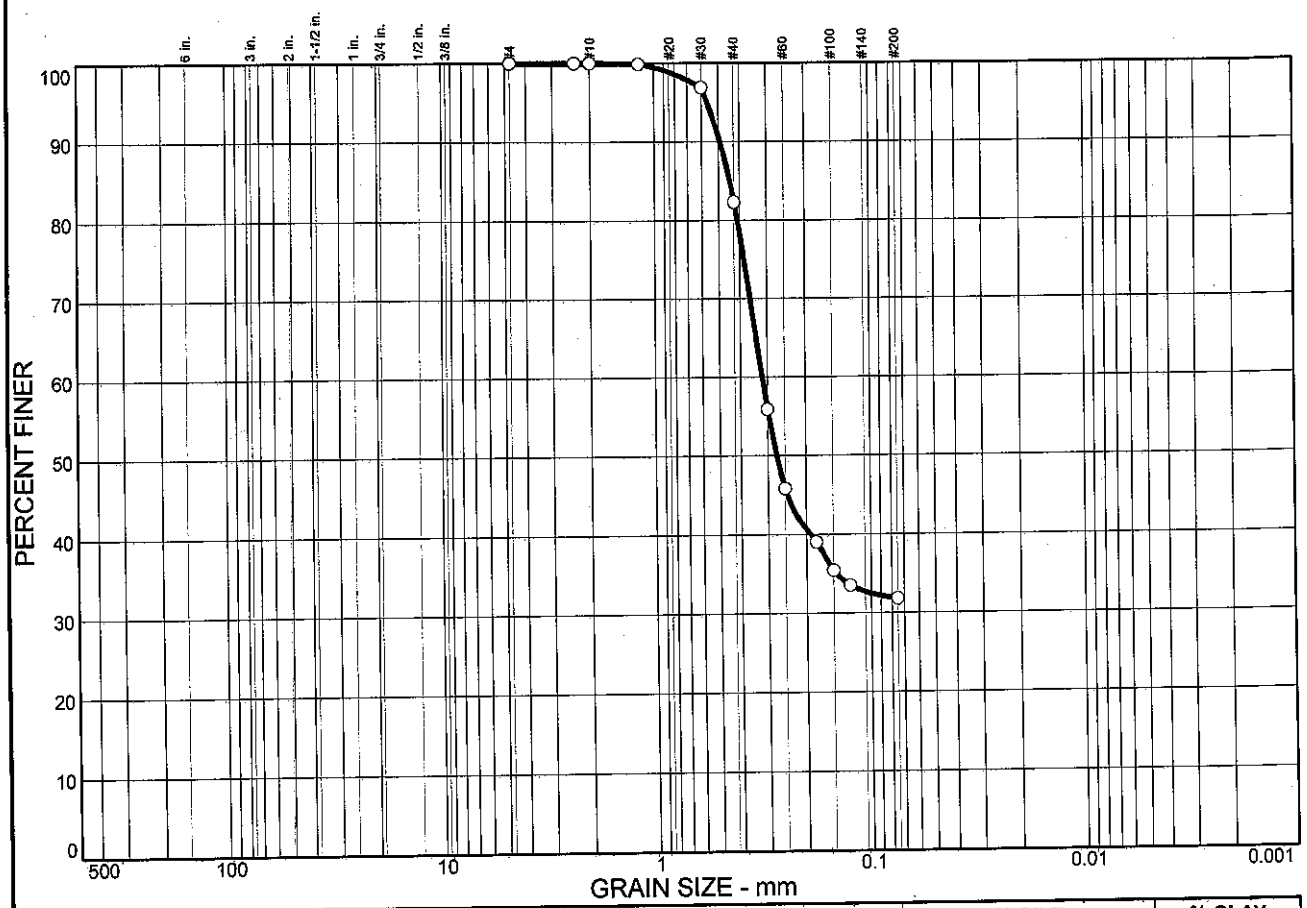
B-12
S-7

Sample No.: S-7 **Source of Sample:** **Date:**
Location: B-12 **Elev./Depth:** 12 to 14 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	68.2	31.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.9		
#30	96.9		
#40	82.3		
#50	55.9		
#60	45.8		
#80	39.0		
#100	35.4		
#120	33.5		
#200	31.8		

* (no specification provided)

Soil Description

Silty, Sandy PEAT (PT)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.445 D_{60}= 0.317 D_{50}= 0.273
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= PT AASHTO= A-8

Remarks

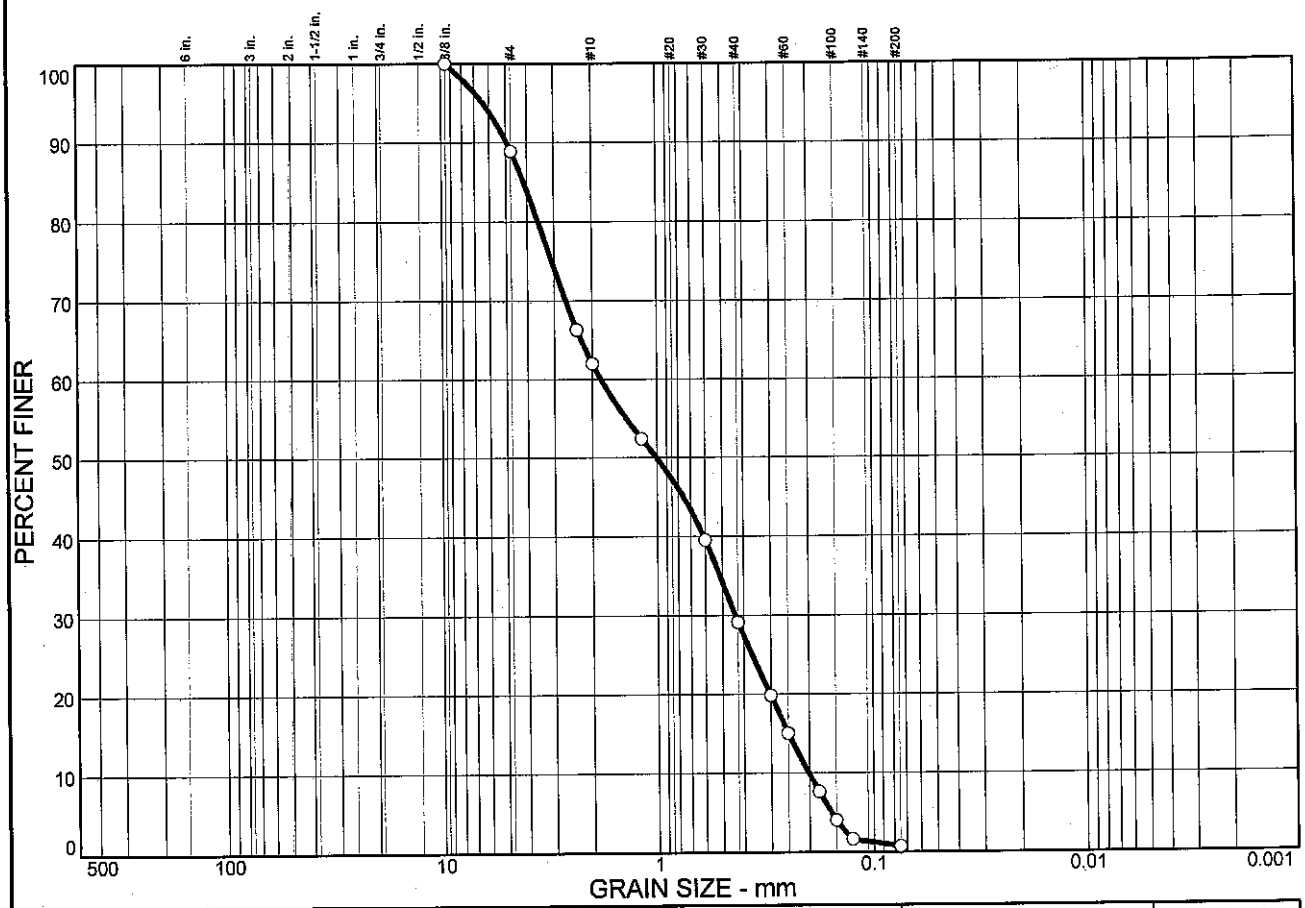
B-13
S-5

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-13 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.1	88.2	0.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	88.9		
#8	66.3		
#10	62.0		
#16	52.4		
#30	39.5		
#40	29.1		
#50	19.8		
#60	15.0		
#80	7.6		
#100	4.0		
#120	1.6		
#200	0.7		

* (no specification provided)

Soil Description

Poorly graded fine to coarse SAND (SP) with trace fine Stone

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.15 D_{60}= 1.83 D_{50}= 1.01
D_{30}= 0.438 D_{15}= 0.250 D_{10}= 0.201
C_u= 9.07 C_c= 0.52

Classification

USCS= SP AASHTO= A-1-b

Remarks

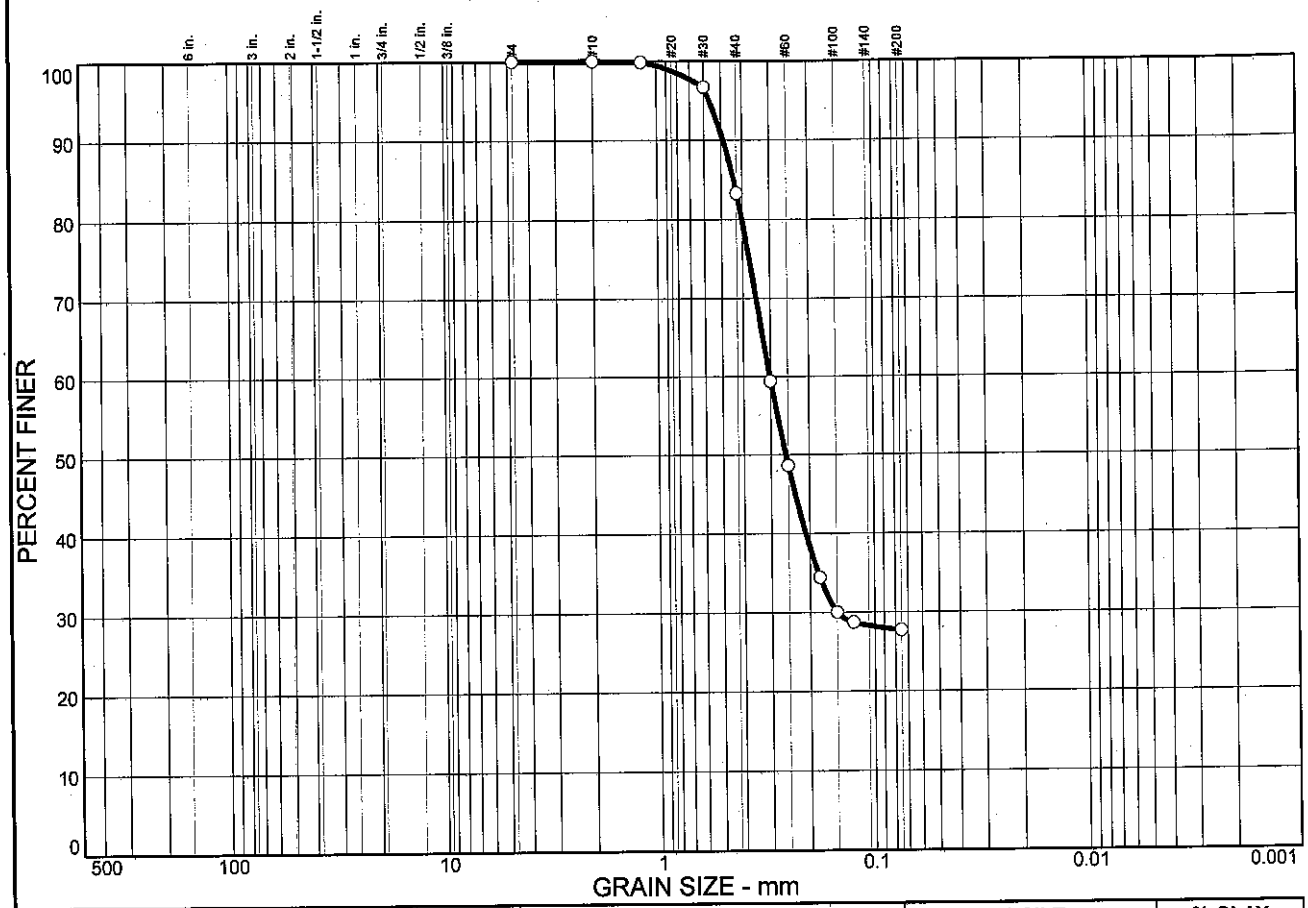
B-13
S-9

Sample No.: S-9 **Source of Sample:** **Date:**
Location: B-13 **Elev./Depth:** 16 to 18 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	72.3	27.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	99.9		
#30	96.7		
#40	83.3		
#50	59.4		
#60	48.6		
#80	34.4		
#100	30.0		
#120	28.7		
#200	27.7		

* (no specification provided)

Soil Description

Silty fine to medium SAND (SM)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.439 D_{60}= 0.303 D_{50}= 0.257
D_{30}= 0.150 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

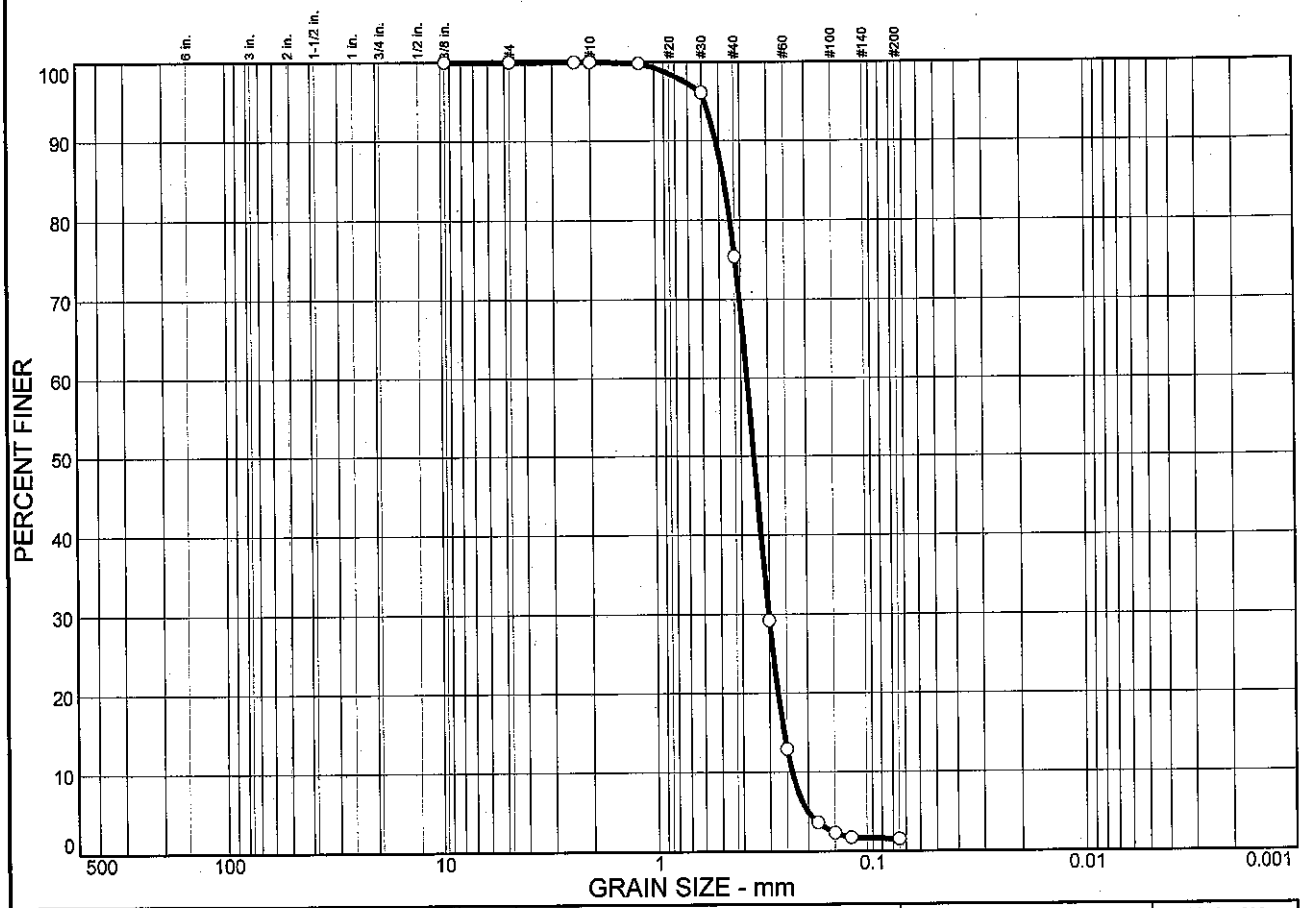
B-14
S-2

Sample No.: S-2 **Source of Sample:** **Date:**
Location: B-14 **Elev./Depth:** 2 to 4 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.5	1.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.8		
#30	96.1		
#40	75.4		
#50	29.2		
#60	12.9		
#80	3.6		
#100	2.3		
#120	1.7		
#200	1.5		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP) with trace root fragments

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.475 D_{60}= 0.376 D_{50}= 0.350
D_{30}= 0.302 D_{15}= 0.258 D_{10}= 0.237
C_u= 1.58 C_c= 1.02

Classification

USCS= SP AASHTO= A-3

Remarks

B-14
S-5

Sample No.: S-5 **Source of Sample:** **Date:**
Location: B-14 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.5	0.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#16	99.9		
#30	99.2		
#40	95.4		
#50	80.2		
#60	62.5		
#80	21.9		
#100	6.5		
#120	2.2		
#200	0.5		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.322 D_{60}= 0.245 D_{50}= 0.226
D_{30}= 0.193 D_{15}= 0.168 D_{10}= 0.159
C_u= 1.54 C_c= 0.96

Classification

USCS= SP AASHTO= A-3

Remarks

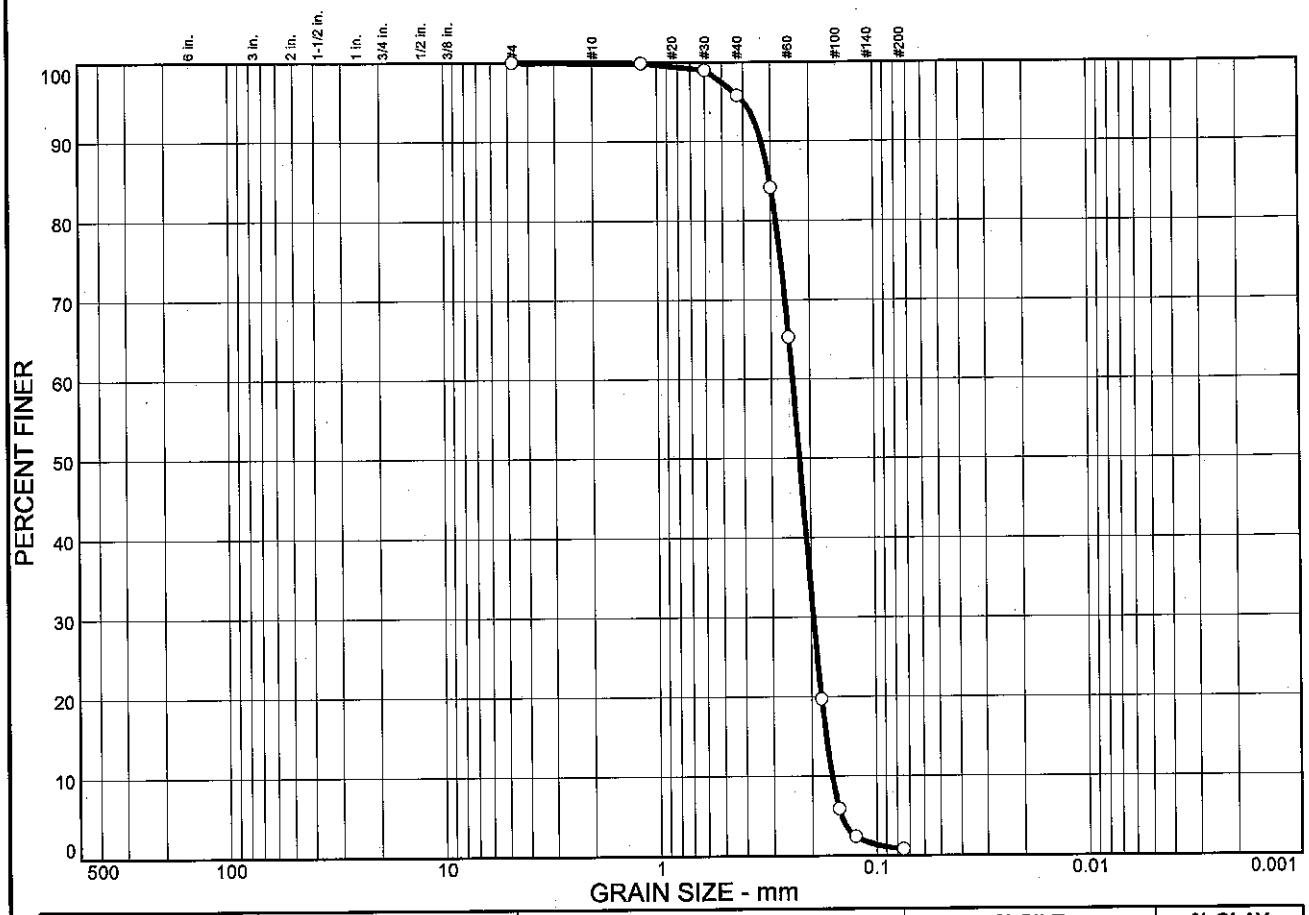
B-18
S-4

Sample No.: S-4 **Source of Sample:** **Date:** 3/23/10
Location: B-18 **Elev./Depth:** 6 to 8 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.2	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#16	99.9		
#30	99.0		
#40	95.8		
#50	84.2		
#60	65.3		
#80	19.7		
#100	5.9		
#120	2.4		
#200	0.8		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.303 D_{60}= 0.240 D_{50}= 0.224
D_{30}= 0.196 D_{15}= 0.172 D_{10}= 0.162
C_u= 1.49 C_c= 0.98

Classification

USCS= SP AASHTO= A-3

Remarks

B-19
S-3

Sample No.: S-3 **Source of Sample:** **Date:** 3-23-10
Location: B-19 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	97.9	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#16	100.0		
#30	99.2		
#40	94.6		
#50	79.4		
#60	61.0		
#80	21.1		
#100	7.8		
#120	4.4		
#200	2.1		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.325 D_{60}= 0.248 D_{50}= 0.229
D_{30}= 0.195 D_{15}= 0.168 D_{10}= 0.157
C_u= 1.58 C_c= 0.98

Classification

USCS= SP AASHTO= A-3

Remarks

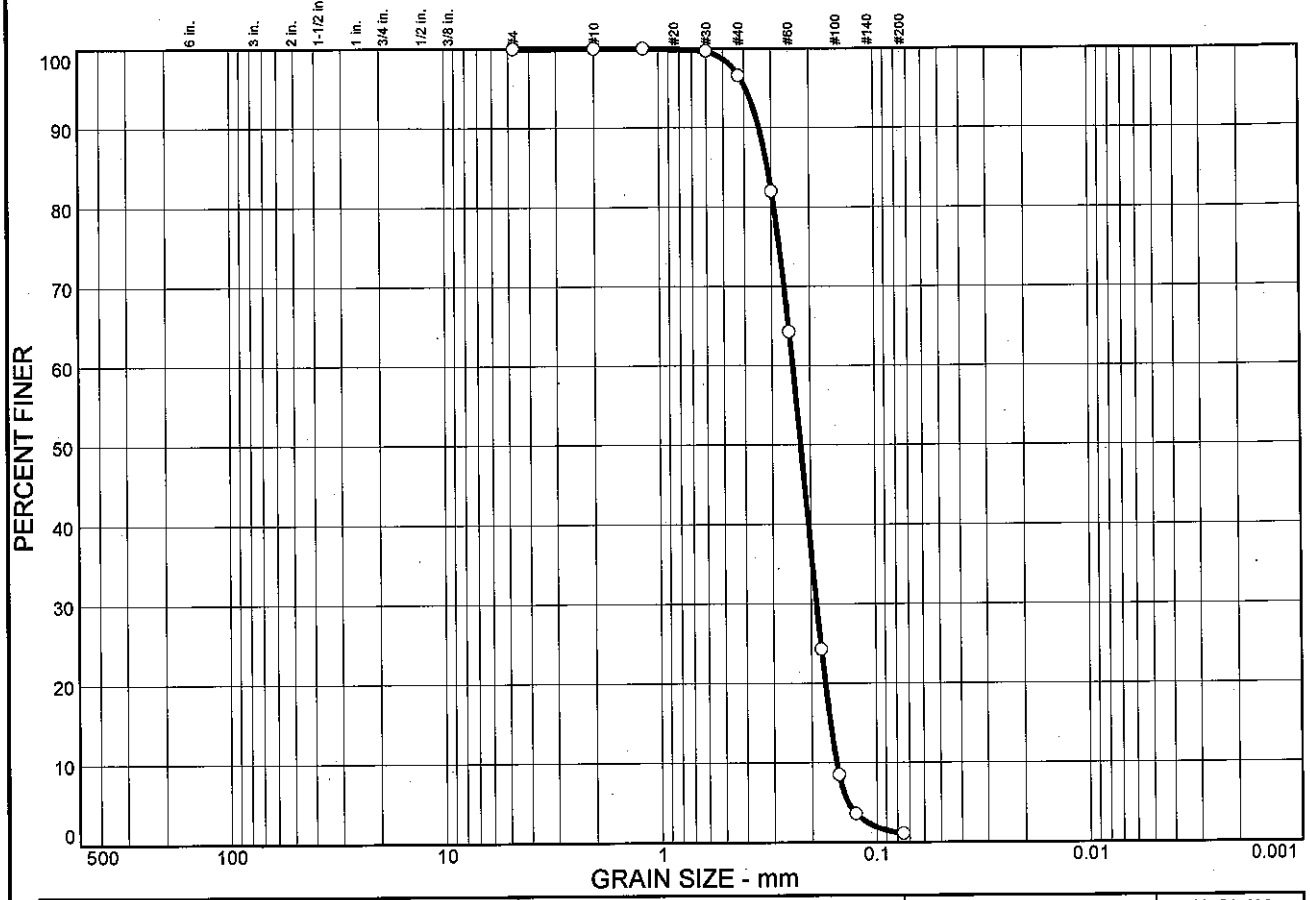
B-20
S-3

Sample No.: S-3 **Source of Sample:** **Date:** 3-23-10
Location: B-20 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.9	1.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	100.0		
#30	99.7		
#40	96.6		
#50	82.0		
#60	64.3		
#80	24.3		
#100	8.5		
#120	3.6		
#200	1.1		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.313 D_{60}= 0.241 D_{50}= 0.222
D_{30}= 0.189 D_{15}= 0.164 D_{10}= 0.154
C_u= 1.57 C_c= 0.97

Classification

USCS= SP AASHTO= A-3

Remarks

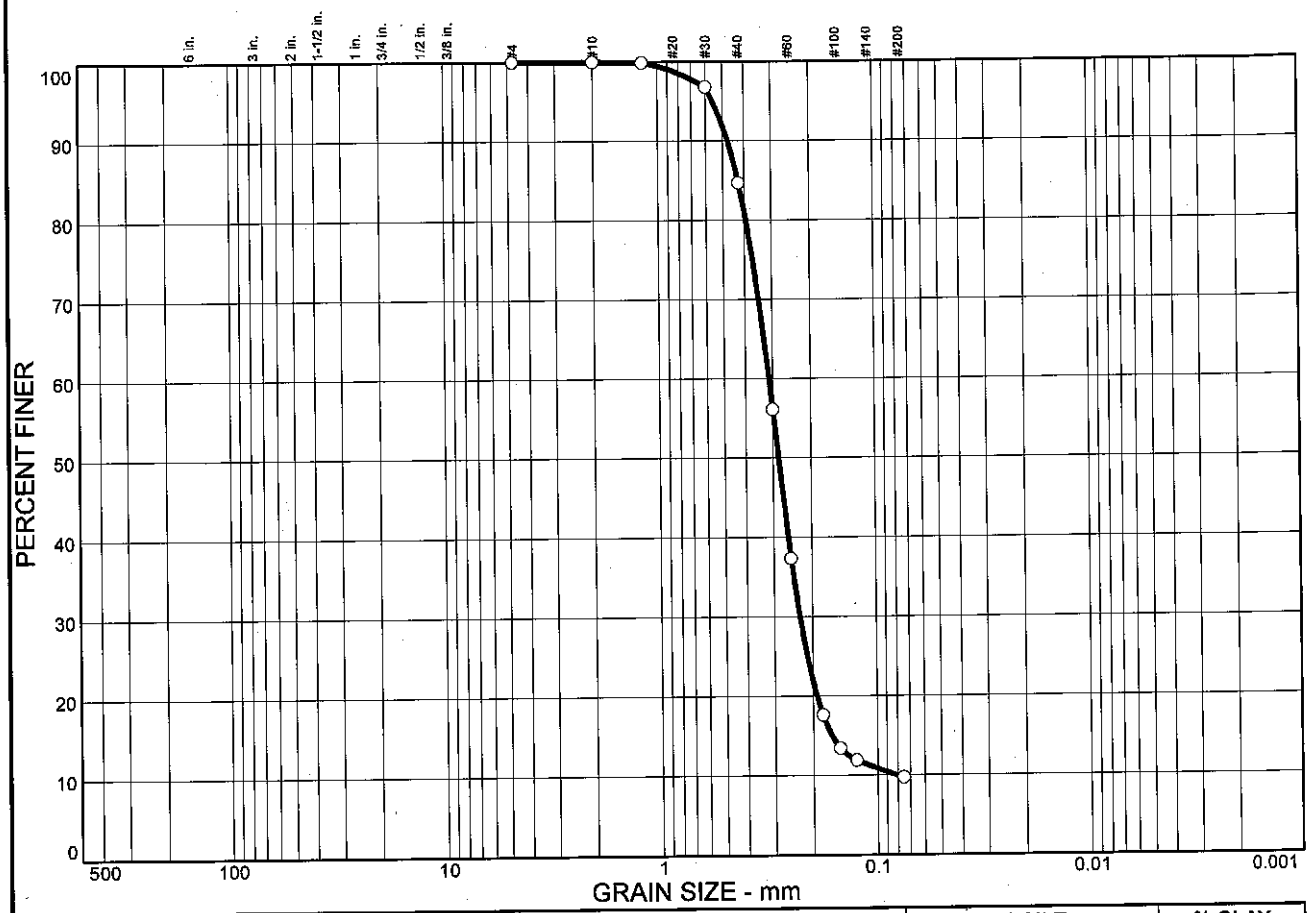
B-21
S-4

Sample No.: S-4 **Source of Sample:** **Date:** 3-23-10
Location: B-21 **Elev./Depth:** 6 to 8 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	90.3	9.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	99.9		
#30	96.8		
#40	84.7		
#50	56.1		
#60	37.3		
#80	17.6		
#100	13.4		
#120	11.9		
#200	9.7		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.427 D_{60}= 0.312 D_{50}= 0.283
D_{30}= 0.229 D_{15}= 0.164 D_{10}= 0.0811
C_u= 3.85 C_c= 2.07

Classification

USCS= SP-SM AASHTO= A-3

Remarks

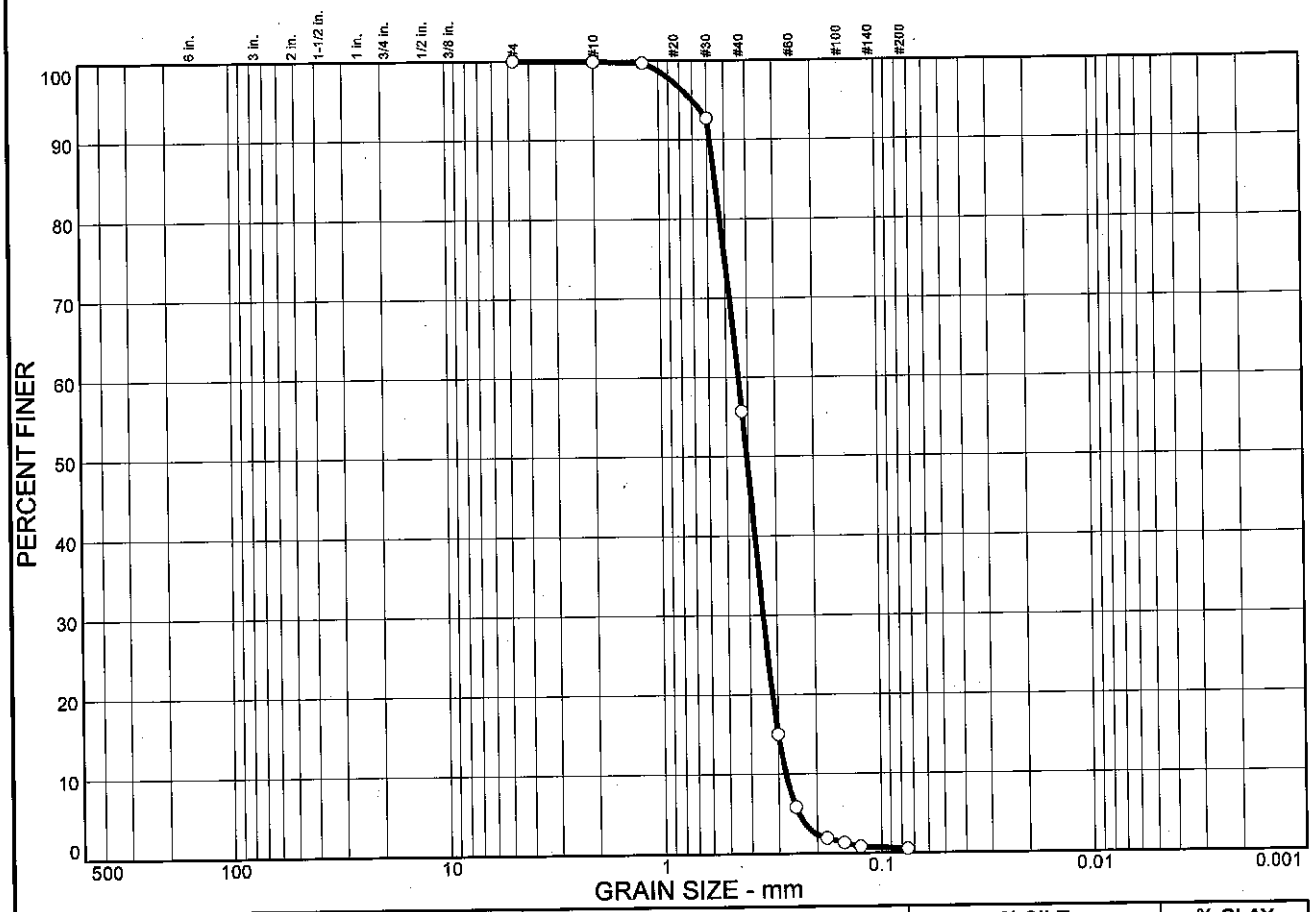
B-22
S-3

Sample No.: S-3 **Source of Sample:** **Date:** 3-23-10
Location: B-22 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	99.5	0.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#16	99.7		
#30	92.7		
#40	55.7		
#50	15.0		
#60	5.8		
#80	1.9		
#100	1.3		
#120	0.8		
#200	0.5		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.555 D_{60}= 0.440 D_{50}= 0.406
D_{30}= 0.347 D_{15}= 0.300 D_{10}= 0.278
C_u= 1.58 C_c= 0.99

Classification

USCS= SP AASHTO= A-3

Remarks

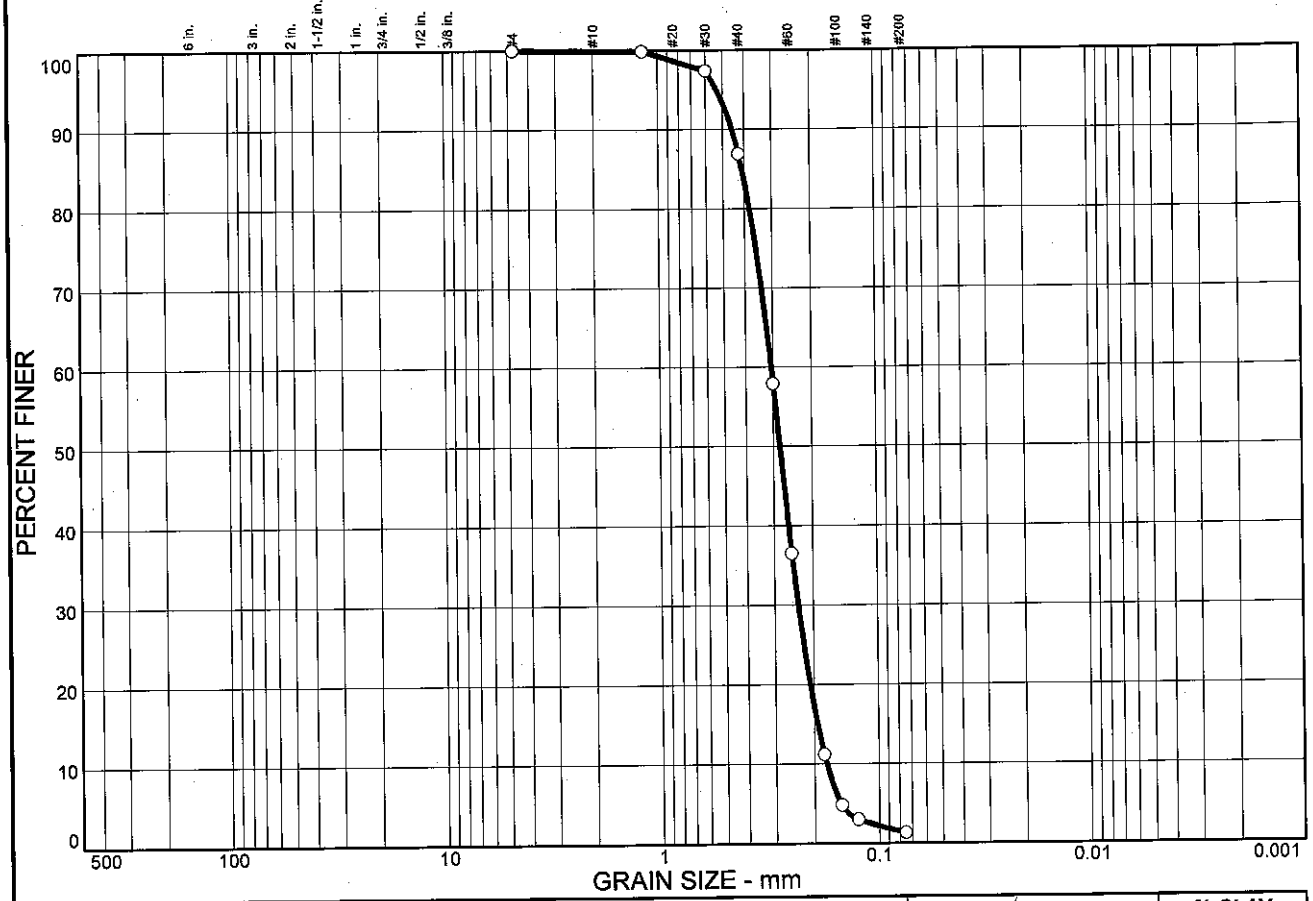
B-22
S-5

Sample No.: S-5 **Source of Sample:** **Date:** 3-23-10
Location: B-22 **Elev./Depth:** 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.7	1.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#16	99.9		
#30	97.4		
#40	86.9		
#50	57.9		
#60	36.5		
#80	11.2		
#100	4.8		
#120	3.0		
#200	1.3		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.411 D_{60}= 0.306 D_{50}= 0.281
D_{30}= 0.235 D_{15}= 0.193 D_{10}= 0.175
C_u= 1.74 C_c= 1.03

Classification

USCS= SP AASHTO= A-3

Remarks

B-23
S-4

Sample No.: S-4 **Source of Sample:** **Date:** 3-23-10
Location: B-23 **Elev./Depth:** 6 to 8 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	68.8	31.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.8		
#30	99.0		
#40	95.3		
#50	85.2		
#60	74.9		
#80	49.4		
#100	36.8		
#120	33.0		
#200	31.2		

* (no specification provided)

Soil Description

Silty fine to medium SAND (SM) with clay

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.299 D_{60}= 0.205 D_{50}= 0.181
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

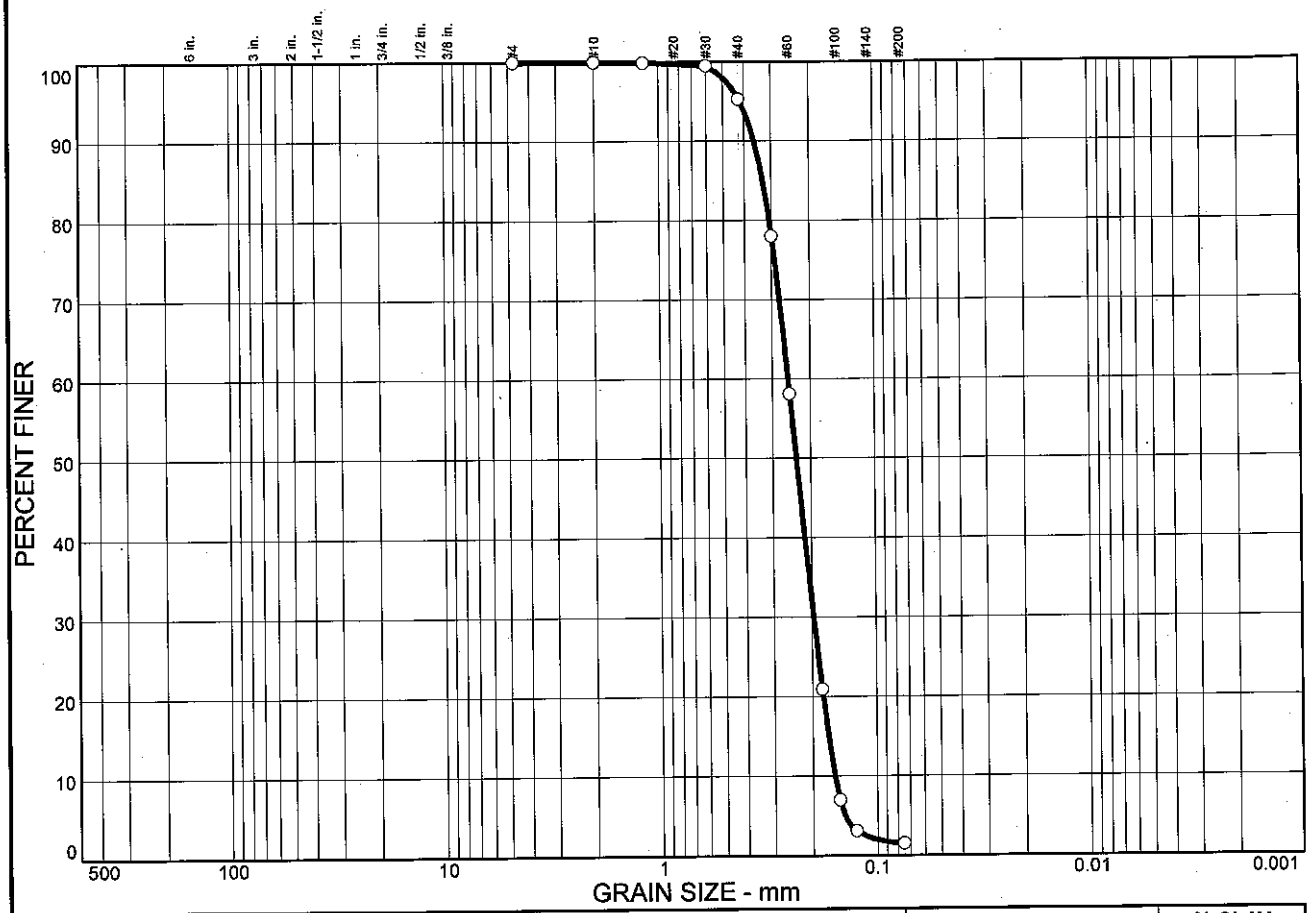
B-24
S-2

Sample No.: S-2/B **Source of Sample:** **Date:** 3-23-10
Location: B-24 **Elev./Depth:** 3 to 4 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.5	1.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	99.9		
#30	99.5		
#40	95.3		
#50	78.0		
#60	58.1		
#80	20.9		
#100	7.0		
#120	3.1		
#200	1.5		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.329 D_{60}= 0.254 D_{50}= 0.234
D_{30}= 0.197 D_{15}= 0.169 D_{10}= 0.158
C_u= 1.61 C_c= 0.96

Classification

USCS= SP AASHTO= A-3

Remarks

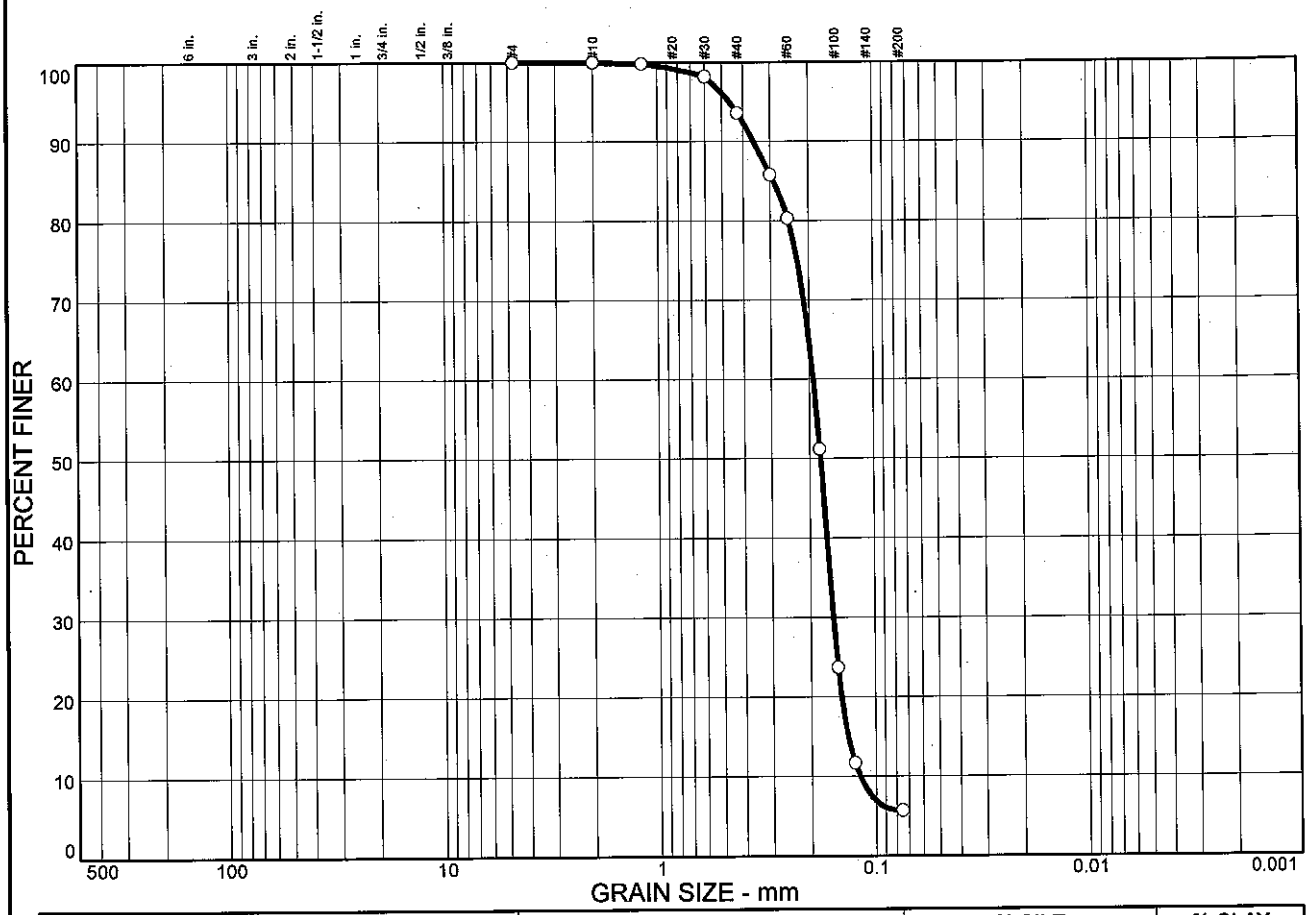
B-24
S-3

Sample No.: S-3/B **Source of Sample:** **Date:** 3-23-10
Location: B-24 **Elev./Depth:** 5 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	94.3	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	99.8		
#30	98.2		
#40	93.6		
#50	85.8		
#60	80.3		
#80	51.2		
#100	23.7		
#120	11.7		
#200	5.7		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM) with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.290 D_{60}= 0.192 D_{50}= 0.179
D_{30}= 0.157 D_{15}= 0.135 D_{10}= 0.118
C_u= 1.63 C_c= 1.09

Classification

USCS= SP-SM AASHTO= A-3

Remarks

B-25
S-3

Sample No.: S-3 **Source of Sample:** **Date:** 3-23-10
Location: B-25 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	91.0	9.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#16	99.7		
#30	98.3		
#40	93.5		
#50	82.3		
#60	74.8		
#80	44.7		
#100	20.3		
#120	12.1		
#200	9.0		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.323 D_{60}= 0.205 D_{50}= 0.187
D_{30}= 0.163 D_{15}= 0.139 D_{10}= 0.105
C_u= 1.95 C_c= 1.23

Classification

USCS= SP-SM AASHTO= A-3

Remarks

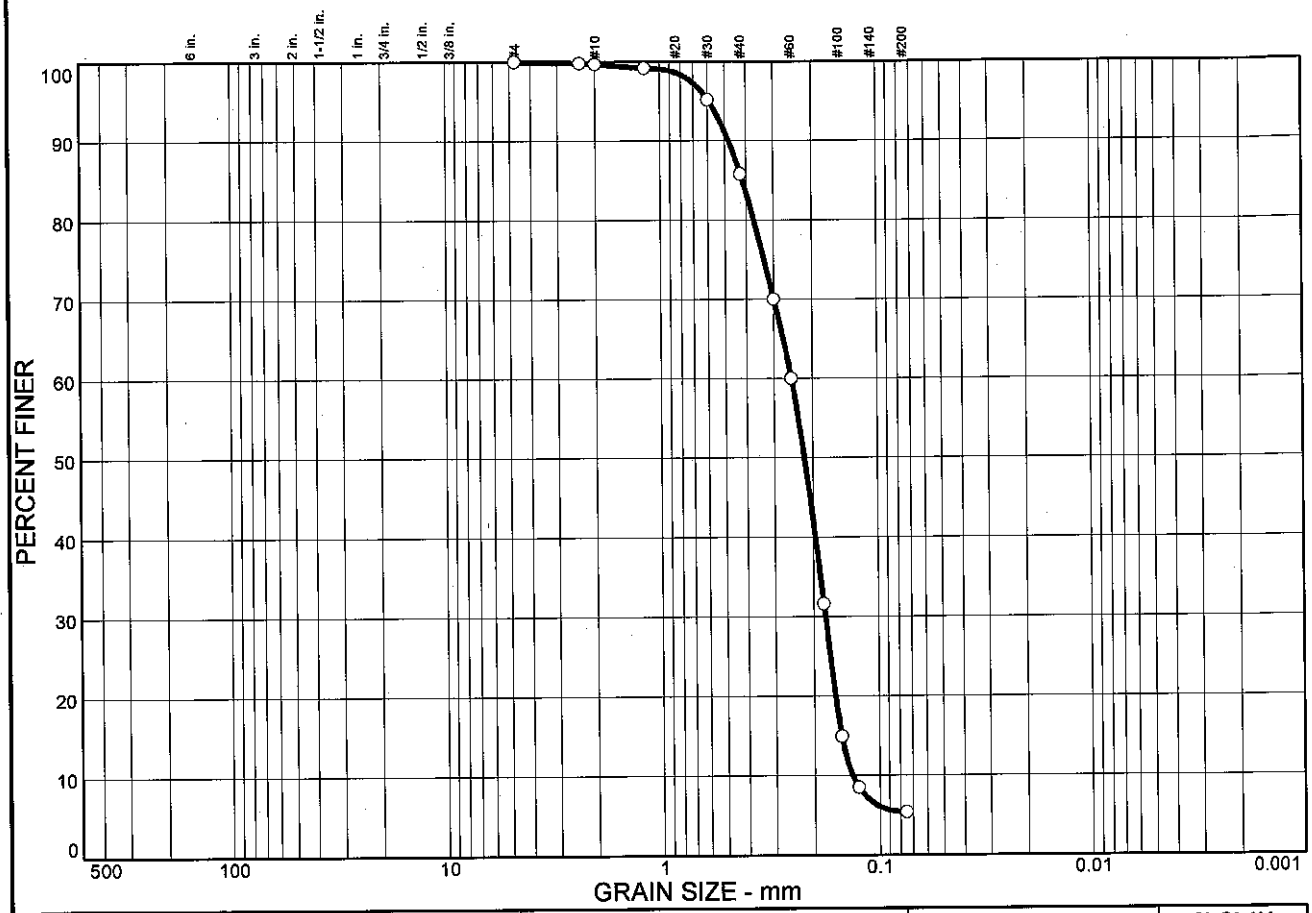
B-26
S-6

Sample No.: S-6 **Source of Sample:** **Date:** 3-23-10
Location: B-26 **Elev./Depth:** 10 to 12 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	94.6	5.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.8		
#10	99.7		
#16	99.2		
#30	95.2		
#40	85.8		
#50	70.0		
#60	60.0		
#80	31.6		
#100	14.9		
#120	8.5		
#200	5.4		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM) with organics
Organic Content = 3.7%

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.416 D_{60}= 0.250 D_{50}= 0.219
D_{30}= 0.177 D_{15}= 0.150 D_{10}= 0.134
C_u= 1.86 C_c= 0.94

Classification

USCS= SP-SM AASHTO= A-3

Remarks

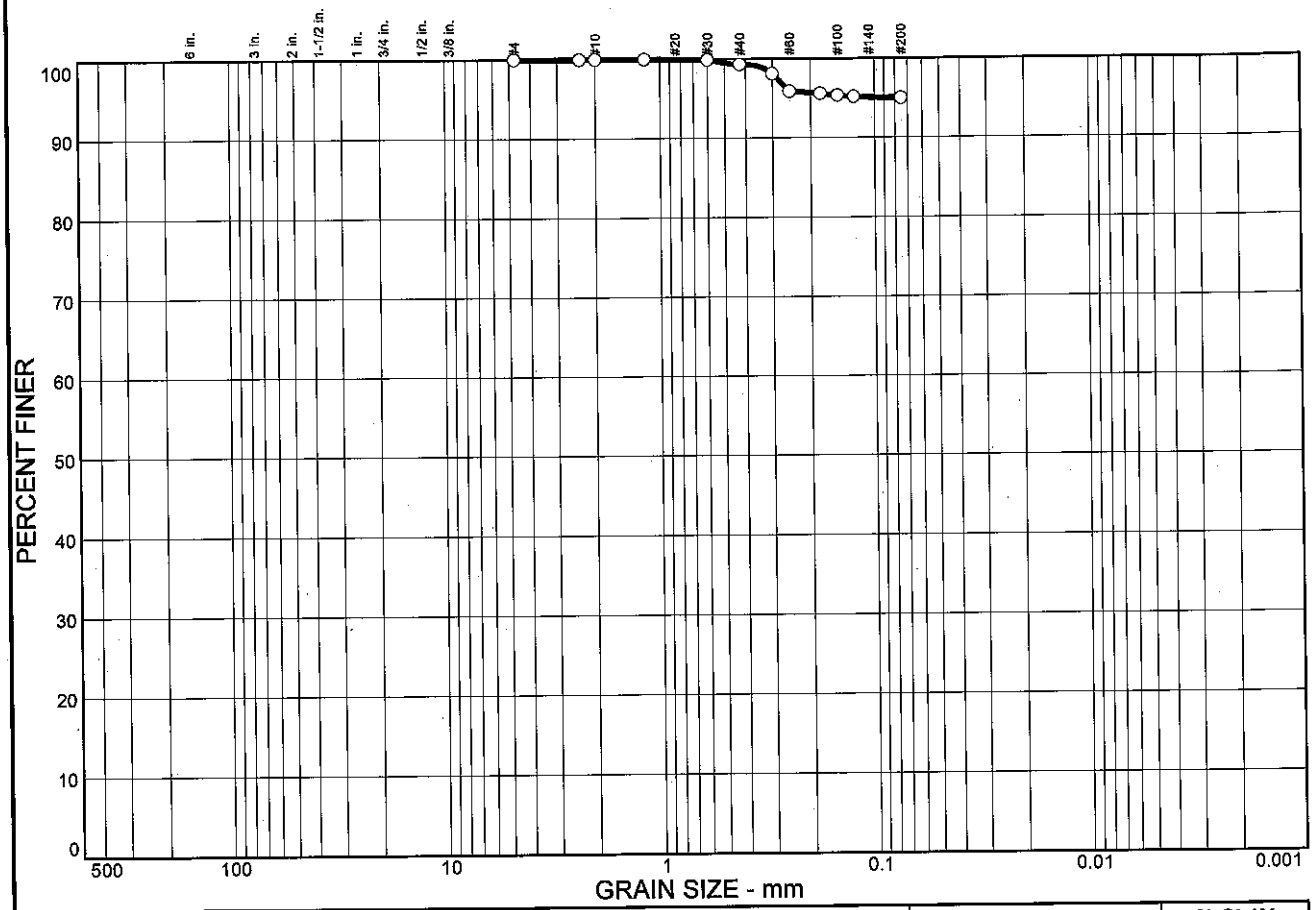
B-27
S-3
Organic Content = 3.74%

Sample No.: S-3 **Source of Sample:** **Date:** 3-23-10
Location: B-27 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	5.0	95.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	99.9		
#40	99.3		
#50	98.1		
#60	95.9		
#80	95.6		
#100	95.4		
#120	95.2		
#200	95.0		

* (no specification provided)

Soil Description

Fat CLAY (CH) with trace fine sand

Atterberg Limits

PL= 21 LL= 66 PI= 45

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(48)

Remarks

B-26
S-6

Sample No.: S-6/B **Source of Sample:** **Date:** 3-23-10
Location: B-27 **Elev./Depth:** 11 to 12 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	86.8	13.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.9		
#10	99.8		
#16	99.7		
#30	98.3		
#40	93.6		
#50	82.3		
#60	73.6		
#80	42.7		
#100	23.4		
#120	16.3		
#200	13.2		

* (no specification provided)

Soil Description

Silty fine to medium SAND (SM)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.322 D_{60}= 0.211 D_{50}= 0.192
D_{30}= 0.161 D_{15}= 0.115 D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

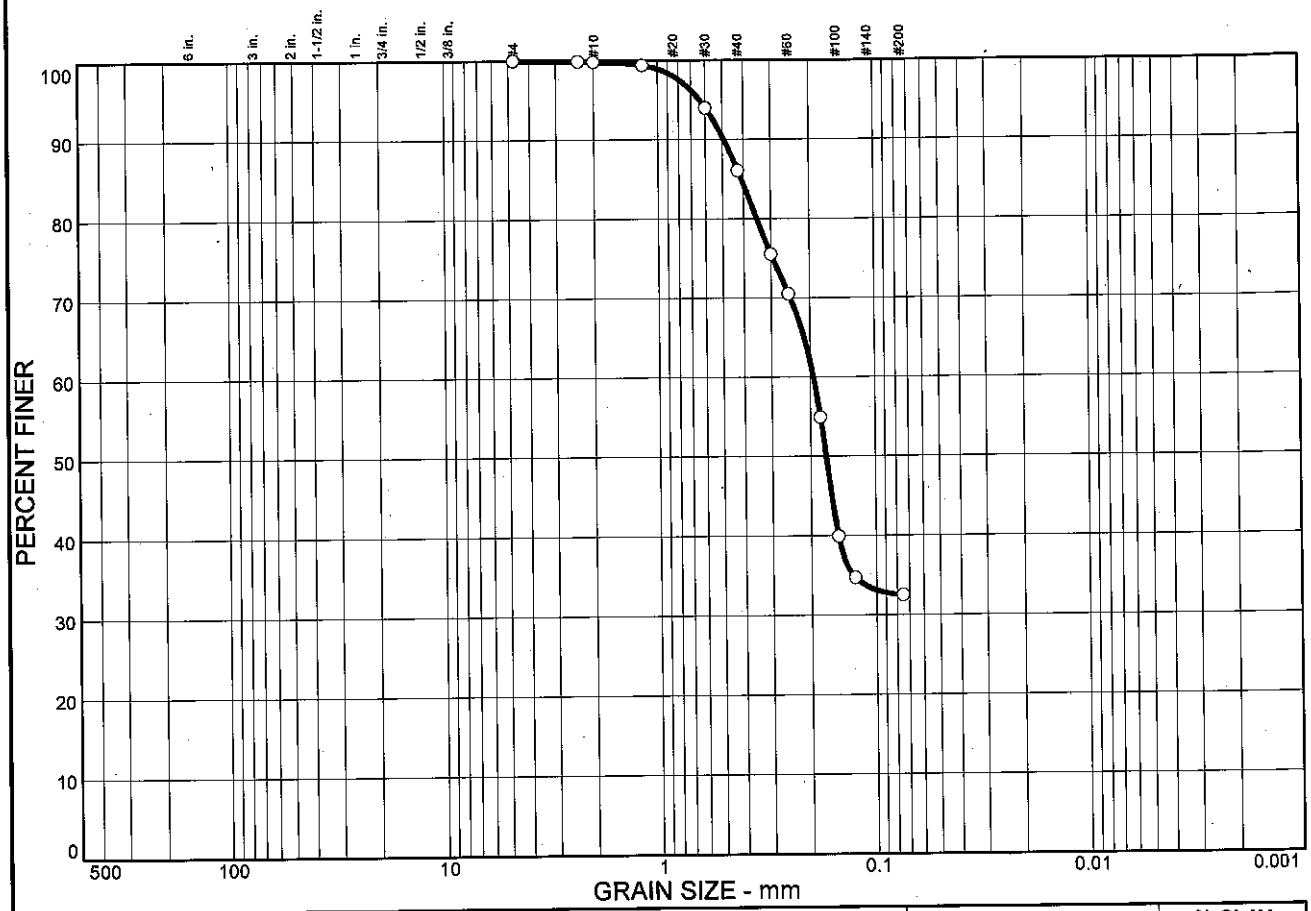
B-28
S-3

Sample No.: S-3 **Source of Sample:** **Date:** 3-23-10
Location: B-28 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	67.5	32.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.9		
#10	99.8		
#16	99.4		
#30	94.0		
#40	86.1		
#50	75.5		
#60	70.5		
#80	54.9		
#100	39.9		
#120	34.7		
#200	32.5		

* (no specification provided)

Soil Description

Clayey fine to medium SAND (SC)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.409 D_{60}= 0.193 D_{50}= 0.170
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO= A-2

Remarks

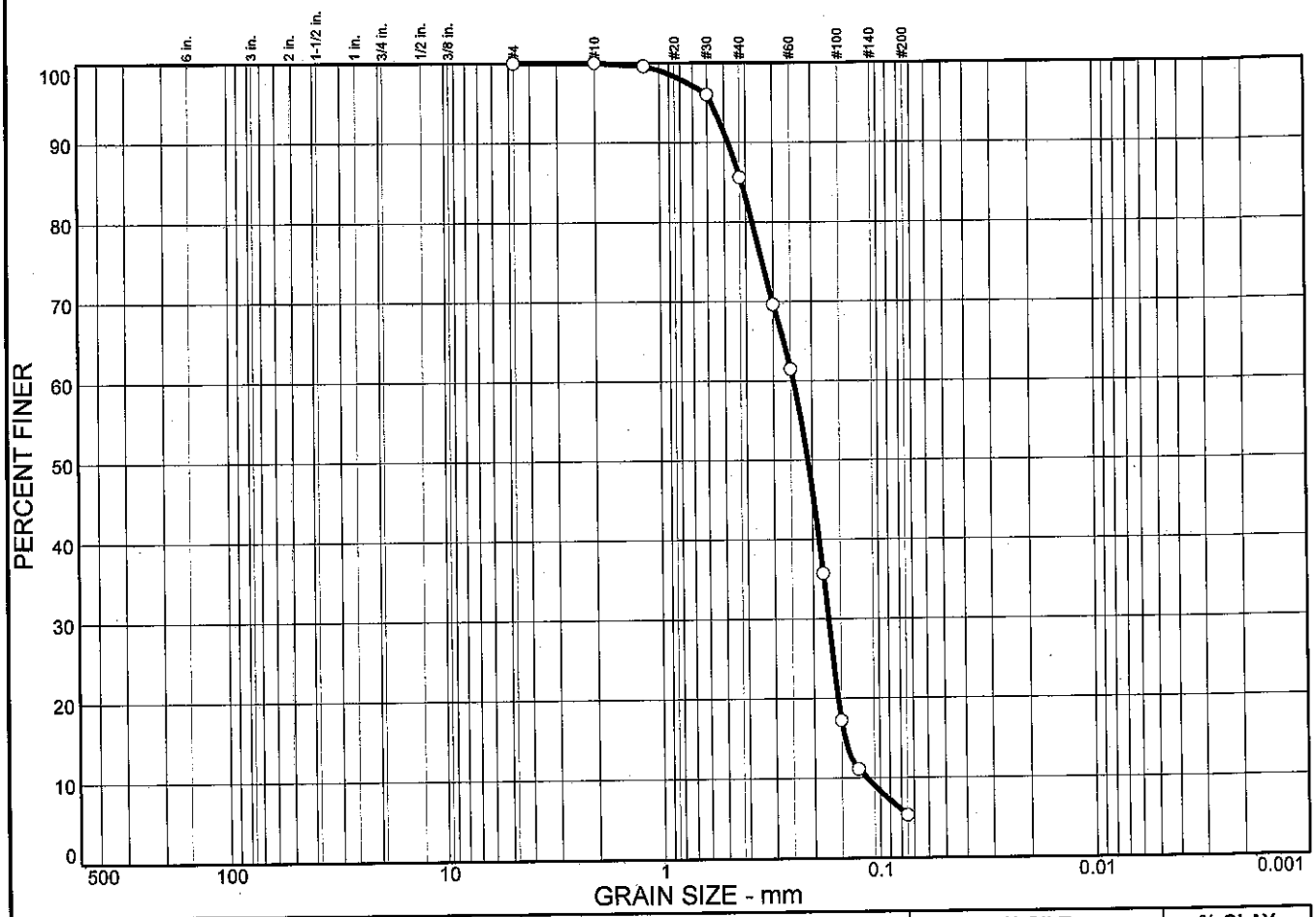
B-29
S-2

Sample No.: S-2/B **Source of Sample:** **Date:** 3-23-10
Location: B-29 **Elev./Depth:** 3 to 4 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	94.7	5.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#16	99.6		
#30	96.0		
#40	85.6		
#50	69.6		
#60	61.5		
#80	35.7		
#100	17.2		
#120	11.1		
#200	5.3		

* (no specification provided)

Soil Description

Poorly graded fine to medium SAND (SP-SM) with silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 0.419 D_{60}= 0.243 D_{50}= 0.210
D_{30}= 0.171 D_{15}= 0.145 D_{10}= 0.115
C_u= 2.11 C_c= 1.04

Classification

USCS= SP-SM AASHTO= A-3

Remarks

B-30
S-1

Sample No.: S-1
Location: B-30

Source of Sample:

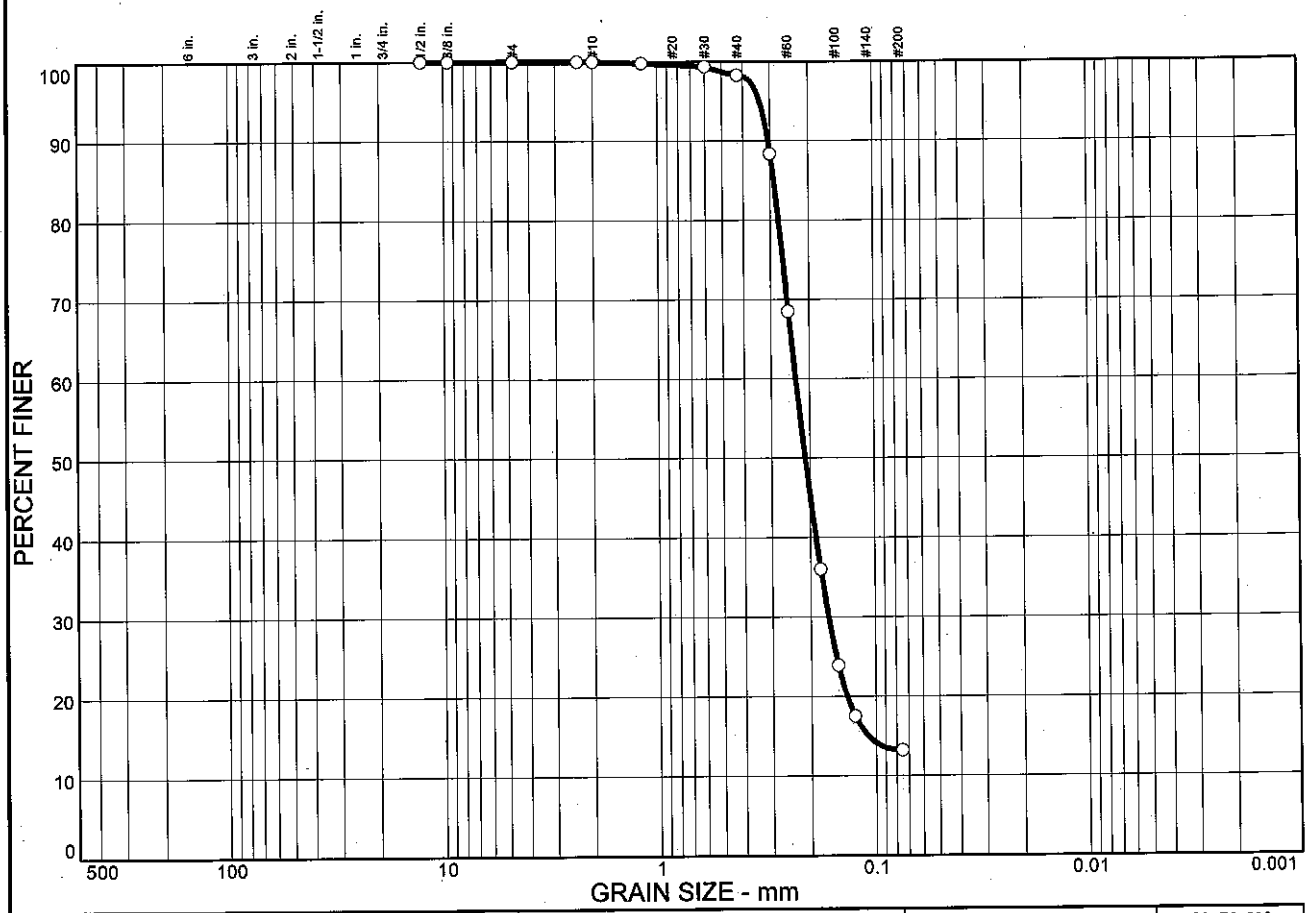
Date: 3-23-10
Elev./Depth: 0.5 to 2 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	86.8	13.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.8		
#30	99.4		
#40	98.3		
#50	88.4		
#60	68.5		
#80	36.0		
#100	23.9		
#120	17.5		
#200	13.2		

* (no specification provided)

Soil Description

Tan Silty fine to medium SAND (SM) with trace organics

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.289 D_{60}= 0.232 D_{50}= 0.211
D_{30}= 0.166 D_{15}= 0.109 D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

HA-24
Proctor #2

Sample No.: Bulk Sample **Source of Sample:** **Date:** 3/23/10
Location: HA-24 **Elev./Depth:** 0.5 to 1.5 feet

GET SOLUTIONS, INC.

Client: CDM
Project: Roanoke Island Water System Improvements
Project No: EC09-249G **Figure**

MOISTURE DENSITY RELATIONSHIP (PROCTOR CURVE)

Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
0.5 to 2 feet	SP-SM	A-3	22.9		NP	NP	0.0	5.3

TEST RESULTS

Maximum dry density = 107.9 pcf

Optimum moisture = 12.6 %

MATERIAL DESCRIPTION

Poorly graded fine to medium SAND (SP-SM) with silt

Project No. EC09-249G **Client:** CDM

Project: Roanoke Island Water System Improvements

● **Location:** B-30

Remarks:

B-30
Proctor No. 1

MOISTURE DENSITY RELATIONSHIP (PROCTOR CURVE)

GET SOLUTIONS, INC.

Figure

MOISTURE DENSITY RELATIONSHIP (PROCTOR CURVE)

Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
0.5 to 1.5 feet	SM	A-2-4(0)	12.7				0.0	13.2

TEST RESULTS

Maximum dry density = 110.0 pcf

Optimum moisture = 12.6 %

MATERIAL DESCRIPTION

Tan Silty fine to medium SAND (SM) with trace organics

Project No. EC09-249G **Client:** CDM

Project: Roanoke Island Water System Improvements

● **Location:** HA-24

Remarks:

HA-24
Proctor No. 2

MOISTURE DENSITY RELATIONSHIP (PROCTOR CURVE)

GET SOLUTIONS, INC.

Figure