Geotechnical Data Report

April 2010

Final Report

Geotechnical Data Report

April 2010

Prepared By:

I. Sacit Akbas, P.E. Geotechnical Engineer Reviewed By:

Danielle K. Neamtu, P.E.

Senior Geotechnical Engineer

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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.

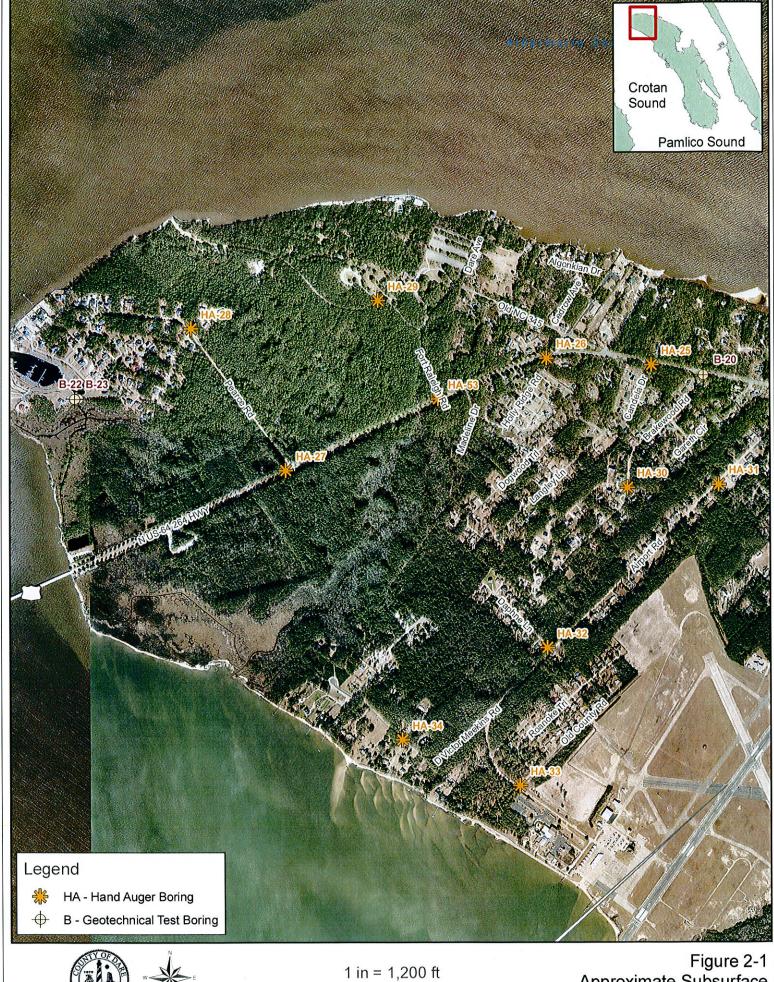
2.3.1 Geotechnical Test Borings

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.









Feet 2,000 1,000

Figure 2-1 Approximate Subsurface Exploration Locations







Feet 2,000 1,000 500

Exploration Locations









Figure 2-3 Approximate Subsurface Exploration Locations

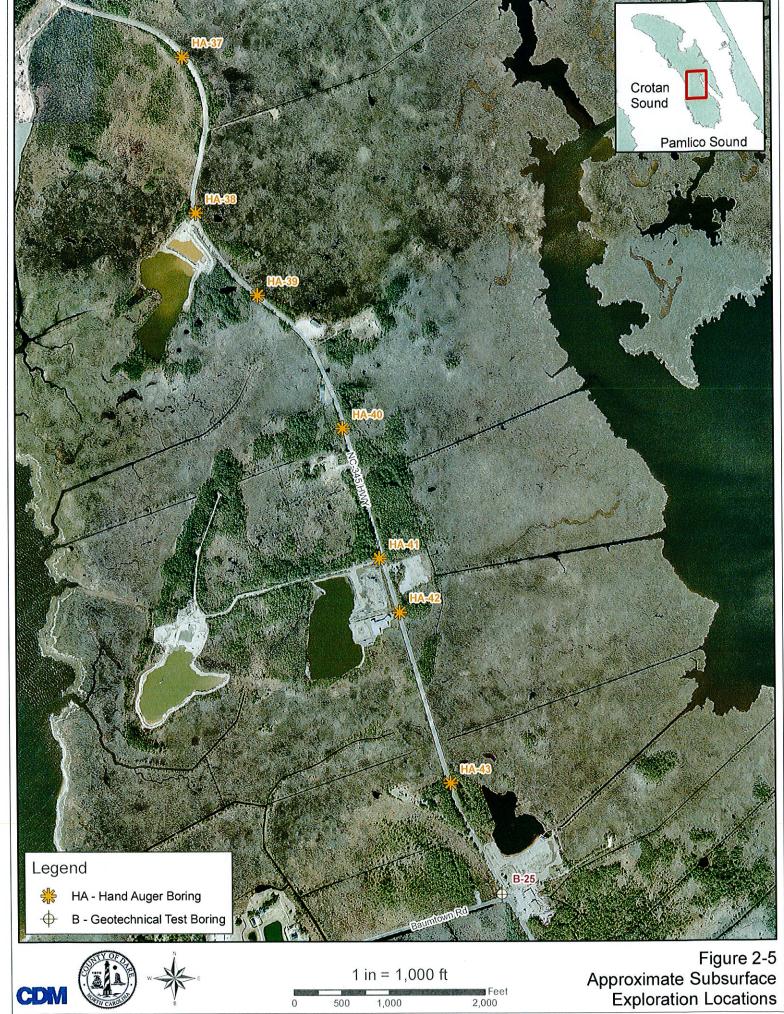






Feet 500 1,000 2,000

Exploration Locations







Feet 2,000 1,000 500

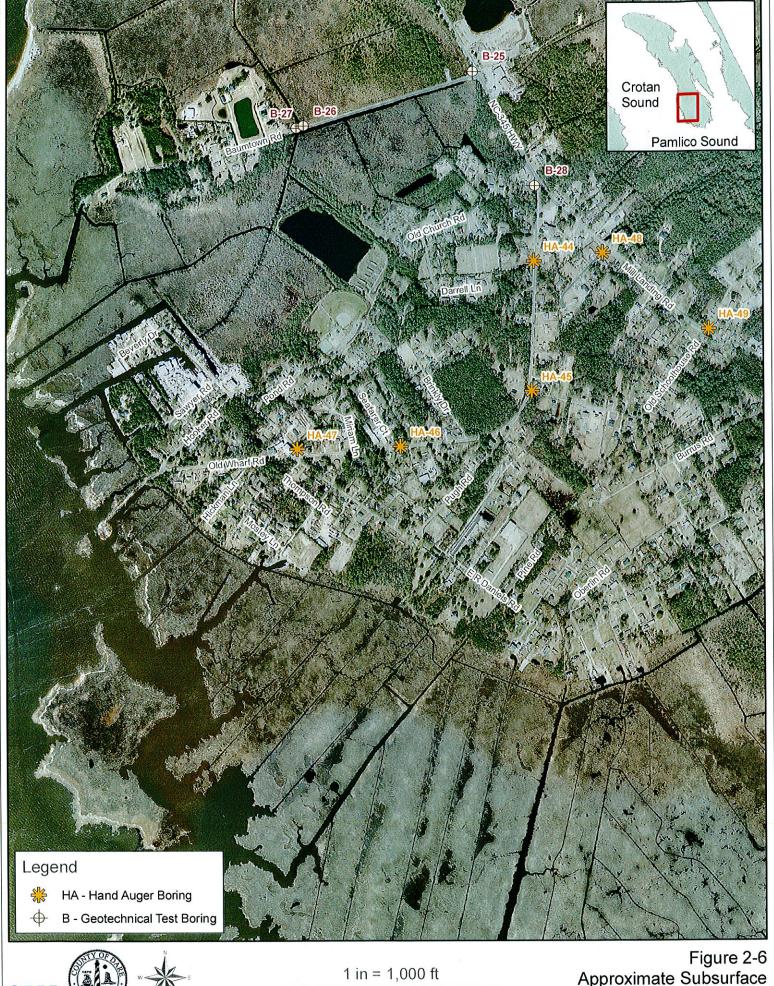
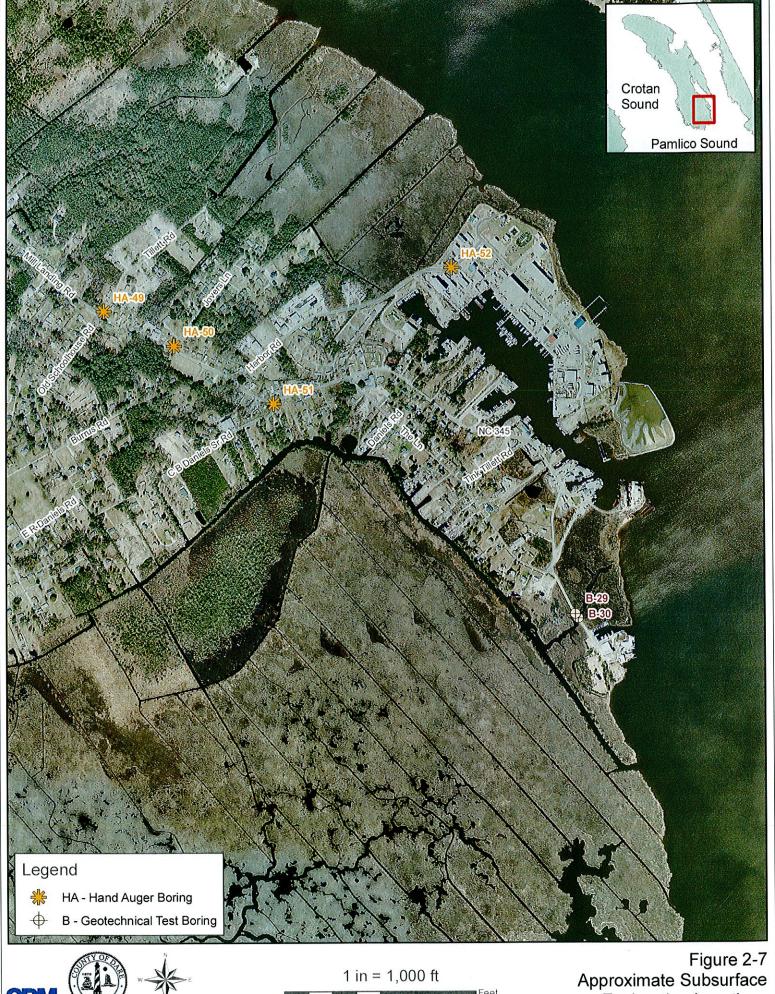








Figure 2-6 Approximate Subsurface Exploration Locations







Feet 2,000 1,000 500

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.



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⁾ (ff
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.



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

_			G	rain Size A	nalysis ⁽¹⁾ (%	(0)	Moisture	Organic	Atterberg l	Limits ⁽⁴⁾ (%
Test Boring No.	Sample No.	Sample Depth (ft)	Gravel	Sand	Fir	nes	Content (2)	Content (3)		DI
			Gravel Sand Silt Clay (%)	(%)	LL	PI				
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	1.7	24.0			
B-2	S-2B	3.0-4.0	0.0	82.7	15	7.3	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	5.5	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

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

			Grain	n Size Analysi	is ⁽¹⁾ (%)	Moisture	Organic
Test Boring No.	Sample No.	Sample Depth (ft)	Gravel	Sand	Fines	Content ⁽²⁾ (%)	Content ⁽³⁾ (%)
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. <i>7</i>	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

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

			Gra	in Size Analys	is ⁽¹⁾ (%)	Moisture	Organic	Atterberg I	Limits ⁽⁴⁾ (%)	Standard Proctor (5)	
Test Boring No.	Sample No.	Sample Depth (ft)	Gravel	Sand	Fines	Content (2) (%)	Content (3) (%)	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				<u></u>	
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.
- Standard Proctor tests were conducted in accordance with ASTM D698.

Abbreviations:

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

Appendix AGeotechnical Test Boring Logs

Phases 1 and 2



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME 45C

Drillers: Will Riddick

Drilling Date: Start: 9-29-09 End: 9-29-09

Borehole Coordinates:

N 793,964.10 E 2,989,209.80

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 2.33

Total Depth (ft.): 70

Depth to Initial Water Level (ft. BGS): 4

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

Logged By: D. Caldwell

		•	0,200.00					
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-1	24/24	0	6	2 3 3 4		FILL	Moist, loose, dark brown, fine SAND, some silt, trace organic material (wood, leaves)FILL-
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	- <u>-2.7</u> -	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	-7.7	6	2 2 4 7			Wet, loose, dark brown, fine SAND, trace silt, clay, organic material (wood).
SS	S-6	24/18	-7.7 10	15	4 8 7 6			Wet, medium dense, brown, fine SAND, trace silt, clay
ss	S-7	24/20		9	2 4 5		SP	Wet, loose, brown, fine SAND, trace silt.
			-12.7		7		1 1	

EXPLANATION OF ABBREVIATIONS

BOREHOLE ROANOKE ISLAND.GPJ

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger
AR - Air Rotary
TR - Foam Rotary
MR - Mud Rotary
RC - Reverse Circulation
CT - Cable Tool
JET - Driving

Driving Drill Through Casing

SAMPLING TYPES:

Auger/Grab Sample California Sampler 1.5" Rock Core 2.1" Rock Core AS CS BX GP HP SS T WS Geoprobe Hydro Punch Split Spoon Shelby Tube

Wash Sample AGS -

Above Ground Surface

REMARKS

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

Reviewed by: 1.5.A.

Date:



Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

				Island,	_			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
	<u>-</u> -		-12.7 15				SP	
					1	_		Mat year lease to lease busylin fine to madigine CAND trans oil
					2			Wet, very loose to loose, brown, fine to medium SAND, trace silt, gravel.
SS	S-8	24/14		4	2			
	_		<u>-17.7</u> 20		2	_		
			20					
					1	+		Wet, very loose, brownish gray, fine to medium SAND, trace
ss	S-9	24/12		2	1			gravel.
			00.7	2	1			
			- <u>22.7</u> 25					
			_					
		=	_					
					1 2			Wet, very loose, light brown, fine to medium SAND, trace silt.
SS	S-10	24/10		3	1			
			<u>-27.7</u> 30		2			
			30					
ł								
			_					
	·							
_				_	1	1		Wet, very loose, brown to dark gray, fine to medium SAND, little
SS	S-11	24/12			2			gravel, trace silt.
	9-11	£712		3	1 2			·
			- <u>32.7</u> 35			1		
			- →		8	→ 1000000001		Wet, dense, gray, fine to medium SAND, trace silt, shell (sand



Client: Dare County

Proj	ect Locati	ion: Ro	anoke	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		SP	
			- <u>37.7</u> 40		25			
			40					
					-			
			-		5 9			Wet, medium dense, brown, fine to medium SAND, trace shell (sand size) fragments.
SS	S-13	24/18	-	25	16	700	SP	Wet, medium dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments, weak cementation.
			<u>-42.7</u> 45		24		SP	Wet, medium dense, gray, fine to medium SAND.
			45					
			<u> </u>					
			-		16			Wet, dense, gray, fine SAND, trace shell (sand size) fragments.
ss	S-14	24/20	-	71	37 34		.	
			-47 7		37			
	-		- <u>47.7</u> 50					
,								
			·					
					9			Wet, medium dense, gray, fine to medium SAND, some shell
ss	S-15	24/18	<u> </u>		14			(sand to gravel size) fragments.
	3-13	24/10		25	11			
			- <u>52.7</u> 55					
			ļ .					
			-	-				
					2		SM	Wet, loose, gray, fine to medium SAND, little silt, trace shell (sand
					3			to gravel size) fragments.
SS	S-16	24/20	-	5	2			
•			- <u>57.7</u>		5	-		
	·.							
			-	-				



Client: Dare County

Pr	oject Locat	tion: Ro	anoke	Island,	NC			Project Number: 17952-71419
Sample	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	ᄀ	
SS	S-17	24/18	- <u>-62.7</u> -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	 	17	5 10 7		SM	Wet, medium dense, gray, fine SAND, little silt, trace shell (sand to gravel size) fragments.
			- <u>67.7</u> -70		12			
								Boring terminated at 70 feet below ground surface.
			- <u>72.7</u> 75			-		
Borehole Roanoke Island.gpJ CDM_corp.gdt 3/19/10			-77.7 80					
OLE ROANOKE ISLAND.(- <u>82.7</u> 85	-				
BOREH						-		



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME 45C

Drillers: Will Riddick

Drilling Date: Start: 9-29-09 End: 9-30-09

Borehole Coordinates:

N 798,852.80 E 2,983,822.20

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 6.01

Total Depth (ft.): 70

Depth to Initial Water Level (ft. BGS): 6

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

Logged By: D. Caldwell

	90,002.00	L 2,00	0,022.20	,				Logged by. D. Galdwell
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-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		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		SP	Moist to wet, loose to medium dense, brown, fine SAND.
SS	S-4	24/23		20	7 10 10			Wet, medium dense, brownish gray, fine SAND.
SS	S-5	24/18	-4.0	12	2 6 6 7			Wet, medium dense, brownish gray, fine SAND.
ss	S-6	24/15	10	8	2 4 4			Wet, loose, brownish gray, fine to coarse SAND, trace gravel.
ss	S-7	24/18	-	4	1 2 2 3			Wet, very loose to loose, dark brown, fine to medium SAND, trace silt.
HSA SSA HA AR	LING METHOD - Hollow Ste	em Auger n Auger er Rotary ary	-9.0 TION O		REVIA' SAMPLING AS - A CS - C BX - 1 NX - 2 GP - G HP - H	G TYPES	: b Sample Sampler Core Core	REMARKS Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches

EXPLANATION OF ABBREVIATIONS

HA Hand Auger
Air Rotary
Dual Tube Rotary
Foam Rotary
Mud Rotary
Reverse Circulation
Cable Tool AR DTR FR MR RC

JET Jetting Driving Drill Through Casing NX GP HP SS ST WS Geoprobe Hydro Punch Split Spoon Shelby Tube Wash Sample

OTHER: Above Ground Surface

REMARKS

Reviewed by: I.S.A.

3/19/10

Date:

CAMP DRESSER & McKEE



BOREHOLE LOG

Client: Dare County

Proj	ect Locati	ion: Ro	anoke l	Island, I	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
			15				SP	
					1	-		Wet, loose, gray, fine to coarse SAND, trace gravel.
SS	S-8	24/13	- <u>-14.0</u> 20	7	5			Wet, loose, gray, fine SAND.
					·			
SS	S-9	24/21		33 19	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.
			- <u>19.0</u> 25 					
ss	S-10	24/15		26	12 14 12		SP	Wet, medium dense, gray, fine to medium SAND, little shell (sand size) fragments, trace gravel.
			- <u>24.0</u> 30		9			
			-		9			Wet, dense, gray, fine to medium SAND, little shell (sand size)
SS	S-11	24/20	- <u>-29.0</u>	37	20 17 20			fragments, trace gravel.
			35					
			-		10			Wet, dense, gray, fine to medium SAND, little shell (sand size) fragments, trace gravel.



Client: Dare County

ļ		-				-		
Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	ō	Material Description
SS	S-12	24/19		38	19	0	SP	
			<u>34.0</u> 40		23	J ~ C		
			40			, C		
						$\mathcal{C}_{\mathcal{C}}$		
			_		. 11	100		Wet, dense, gray, fine to medium SAND, little shell (sand to gravel
					22	10		size) fragments.
SS	S-13	24/18		43	21			
			-39.0		28			
			45					
			-			V.C		
						VC		
					13 14	$ \bigcirc $		Wet, dense, gray, fine to medium SAND, little shell (sand to gravel size).
ss	S-14	24/24	-	31	17		1	
			_44.0		20	レ こ		
	· · ·		<u>-44.0</u> 50					
						100	1	
		-	† -		7			Wet, very dense, gray, fine to medium SAND, some shell (sand size) fragments.
ss	S-15	24/19	ļ -	56	22 34			Wet, very dense, gray, fine to medium SAND, little shell (sand
	-		40.0	30	43	0]	vvet, very dense, gray, fine to medium SAND, little shell (sand size) fragments, trace silt.
			- <u>49.0</u> -55			+ c		
	*		_			ے را		
						7		
						$\int_{\mathcal{C}} \mathcal{C}$		
		-	† -		2	Tañ	SP-	Wet, loose to medium dense, gray, fine to medium SAND, little
ss	S-16	24/24	L _	40	4		SM	silt, shell (sand to gravel size) fragments, trace clay.
33	J-10			10	6 8	14		
		-	<u>-54.0</u> 60			- 41		
				1 .				
			-				1	
			_					
		1	I	1	1	1 (1)	4 I	



Client: Dare County

Proj	ect Locati	on: Ro	anoke	Island,	NC			Project Number: 17952-71419
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	59.0	62	14 31 31 32		SP	Wet, very dense, gray, fine SAND, trace shell (sand size) fragments.
			<u>59.0</u> 					
			 	-	20			Wet, very dense, gray, fine SAND.
s	S-18	24/24		127	52 75 70			Wet, very dense, dark gray, fine to medium SAND, trace shell (sand size) fragments.
			- <u>64.0</u> 70					Boring terminated at 70 feet below ground surface.
			 		·		-	
			<u>69.</u> 0 75					
	-		- <u>74.0</u> 80				-	
					-			
			- <u>79.0</u> 85					



Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME 45C

Drillers: Will Riddick

Drilling Date: Start: 10-1-09 End: 10-1-09

Borehole Coordinates:

N 798,886.00 E 2,983,809.90

Surface Elevation (ft.): 5.40

Total Depth (ft.): 100

Depth to Initial Water Level (ft. BGS): 6

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

Logged By: D. Caldwell

	<u>, </u>	· ·							·
Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification		Material Description
			0		2		SP	Moist	, loose, grayish brown, fine SAND.
					3				
SS	S-1	24/14		7	4				
					6				
			† ·		4	1	!	Moist	, medium dense, brown, fine SAND.
					8				
SS	S-2	24/21		17	9				
				-	12				
			_		4]		Moist	t, medium dense, gray, fine SAND.
00		24/24	0.4		9.				
SS	S-3	24/24	5	21	12				
			<u> </u>		15				
					12			Wet,	medium dense, gray, fine SAND.
SS	S-4	24/24	L _	0.4	14				
00				24	10				
			<u> </u>		9	_		10/04	medium dense, brownish gray, fine to medium SAND, trace
		24/18			4			silt.	medium dense, prownish gray, line to medium SAND, trace
SS	S-5		. -	12	5				
				12	7				
			<u>-4.6</u> 10		7	4		Wet	loose, brown, fine to medium SAND, trace silt.
			10		2			vvct,	loose, brown, file to mediant or tree, trace one.
SS	S-6	24/18	-	7	3				
				· ·	4				
			+ -		4	\dashv			
							1		
	-	-	+ -		2	\exists		Wet,	loose, brown, fine to medium SAND, trace silt.
					3				
SS	S-7	24/18	-	6	3				
			-9.6		3				
		 XPLANA	-	L ADD	DE\/IA	TIONS	' ' ' '		REMARKS
	E/	VLTAINE	ALION C	/F ADD	NEVIA	I IOIN	,		(CHAILLI ()

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:

ROANOKE ISLAND

G METHODS:
Hollow Stem Auger
Solid Stem Auger
Hand Auger
Air Rotary
Dual Tube Rotary
Foam Rotary SSA HA AR DTR FR MR RC CT JET Mud Rotary Reverse Circulation

Cable Tool
Jetting
Driving
Drill Through Casing

SAMPLING TYPES:

Auger/Grab Sample California Sampler BX NX GP HP 1.5" Rock Core 2.1" Rock Core Geoprobe Hydro Punch

SS ST WS Split Spoon Shelby Tube Wash Sample Above Ground AGS -

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

Reviewed by: /. S. A.

Date:



Client: Dare County

Pro	ject Locati	on: Ro	anoke l	sland, l	NC	٠		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				
			15 				SP					
SS	S-8	24/15	- 146	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.				
			<u>14.6</u> 									
SS	S-9	24/20	- <u>19.6</u> 25	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.				
SS	S-10	24/15	- <u>24.6</u>	23	11 13 10 10		SP	Wet, medium dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments, little gravel.				
SS	S-11	24/24	- <u>29.6</u>	29	3 12 17 19		SP	Wet, medium dense, gray, fine to medium SAND, some shell (sand size) fragments, trace silt.				
							OF .					
			-		12 19			Wet, dense, gray, fine to medium SAND, trace silt, gravel, shell (sand size) fragments				



Client: Dare County

Pro	ject Locat	ion: Ro	anoke	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	24.6	43	24 27		SP	
			- <u>34.6</u> 40					
			_ :					
			-		10 20			Wet, dense, gray, fine to medium SAND, trace shell (sand size) fragments.
SS	S-13	24/20	- <u>39.6</u> 45	46	26 32			
			45					
			- -					
					15			Wet, very dense, gray, fine to medium SAND, trace shell (sand
ss	S-14	24/15	-44.6	62	30 32 36			size) fragments.
			- <u>44.6</u> 50					
			-					
			-					
SS	S-15	24/20		50	6 23 27	700	SP	Wet, dense to very dense, gray, fine to medium SAND, some shell (sand to gravel size) fragments, trace gravel.
			- <u>49.6</u> 55		27	, C		
SS	S-16	24/22			3		SM	Wet, loose, gray, fine to medium SAND, little silt, shell (sand to gravel size) fragments, trace clay, gravel.
	3-10	27166	- <u>54.6</u> 60	9	5			
						//c		



Client: Dare County

Proj	ect Locati	on: Ro	anoke	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	Material Description
ss	S-17	23/23		68	8 24 44		SP	Wet, very dense, brownish gray, fine to medium SAND, little shell (sand size) fragments, trace silt.
•	*	-	<u>59.6</u> 65		50/5"		SP	Wet, very dense, gray, fine to medium SAND, trace silt.
00	0.40	20/22		:	7		SP	Wet, very dense, brownish gray, fine to medium SAND, little shell (sand size) fragments, trace silt.
SS	S-18	22/22	_ <u>-64.6</u> _ 70	52	38 50/4"		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.
			- <u>69.6</u> 75					
		,						
ss	S-20	24/18	_	47	20 24 23			Wet, dense, gray, fine SAND, trace shell (sand size) fragments.
			- <u>74.6</u> 80		20			
SS	S-21	24/24	-79.6	11	4 5 6		SM	Wet, medium dense, gray, fine SAND, little silt, trace shell (sand to gravel size) fragments, gravel.
			85	-				



Client: Dare County

oject Locat	ion: Ro	anoke	Island,	NC			Project Number: 17952-71419
Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
						SM	
S-22	24/24	-84 6	6	2 3 3 4			Wet, loose, gray, fine SAND, little silt, trace shell (sand size) fragments.
		90					
5_23	24/24			3		ML/SN	Wet, medium stiff, gray, SILT and fine SAND, little clay, trace shell (sand size) fragments.
3-23	24/24	- <u>89.6</u> _	6	3			
		95					
		-		2	////	CH	Moist, stiff, dark gray, silty CLAY, trace sand.
S-24	24/24	-	9	4 5 5			Pocket Penetrometer Readings: Top= 1.8 tsf, Bottom= 1.0 tsf
		100					Boring terminated at 100 feet below ground surface.
		ļ .					
i.		-		-			
		<u>99.6</u> 105				,	
		-	-				
·		-					
		-	1				
		404.0	-				
		1104.6 110	1				
	Sample Number S-22 S-23	Sample Number Pulance Sample Number Sample Sample Sample Number Sample S	Sample Number Sample Number	Sample Number values (\$\frac{1}{2}\text{Number Populars} \frac{1}{2}\text{Number Populars} \frac{1}{2}	S-22 24/24 - 6 3 -84.6 90 S-23 24/24 - 6 3 -89.6 95 S-24 24/24 - 9 5 -94.6 100 -99.6 105 -99.6 105	Sample Number Sample Number	Sample Number Solution Soluti



Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-18-09 End: 12-18-09

Borehole Coordinates:

N 794,964.06 E 2,989,153.44

Surface Elevation (ft.): 1.48

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 8

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

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
		-	0		2	12. 11.12	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.
\neg			- †		2	1	SP	Moist, very loose to loose, dark brown, fine SAND, trace clay.
ss	S2	24/17		4	2 2 2			
					1	-		Moist, loose, tan and gray, fine SAND, trace clay.
ss	S3	24/20	- <u>-3.5</u> 5	5	2			
	•				3	-		Moist, medium dense, tan and gray, fine SAND, trace clay.
ss	S4	24/24		14	6 8			
		04/00	_		2 3			Wet, loose, gray, fine SAND.
SS	\$ 5	24/20	_	8	5			
-			- <u>8.5</u> 10		3 3			Wet, loose, gray, fine SAND.
SS	S6	24/18	-	7	4			
					5	_	:	Wet lease were fire CAND
SS	S 7	24/224		9	3 4			Wet, loose, gray, fine SAND.
					5			
	-		-		2	1		Wet, loose, gray, fine SAND.
			-13.5		2			
	E	(PLANA	TION O	F ABB	REVIA	TIONS	•	REMARKS
HSA SSA HA AR	LING METHOD - Hollow Ste - Solid Stem - Hand Aug - Air Rotary - Dual Tube - Foam Rota - Mucl Rota	m Auger Auger er Rotary ary			CS - (BX - 1 NX - 2 GP - (HP - H SS - 5		b Sample Sampler Core Core ach	Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches

EXPLANATION OF ABBREVIATIONS

HA AR DTR FR MR CT JET D DTC Mud Rotary Reverse Circulation Cable Tool
Jetting
Driving
Drill Through Casing

California Samp
1.5" Rock Core
2.1" Rock Core
Geoprobe
Hydro Punch
Split Spoon
Shelby Tube
Wash Sample BX NX GP HP SS ST WS

Above Ground

Reviewed by: 1.5.4.

3/19/10



Client: Dare County

Proj	ect Locati	on: Ro	anoke	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		SP	
					5 2			Wet, very loose to loose, gray, fine SAND.
ss	S9	24/20		4	2			
			-	4	2 3			
					3 3			Wet, loose, gray, fine SAND.
SS	S10	24/18	-	6	3			
			- <u>18.5</u> 20		3	-		
'								
			_					
			_		1	-		Wet, loose, gray, fine to medium SAND.
ss	S11	24/22	_	6	2 4			
			-23.5	0	7			
	,		- <u>23.5</u> 25					
			-					
			_					
					3		sw	Wet, loose, gray, fine to coarse SAND.
SS	S12	24/17	-	7	4 7	****		
			- <u>28.5</u> 30		'			
			-					
	s.		+ -		4			Wet, medium dense, brown, fine to coarse SAND, trace gravel.
SS	S13	24/24	-	18	12			
			- <u>33.5</u> 35		20			
			35					
			-					Boring terminated at 35 feet below ground surface.
			-	1				
	·		-					

CAMP DRESSER & McKEE



BOREHOLE LOG

Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-18-09 End: 12-18-09

Borehole Coordinates:

N 795,272.90 E 2,988,592.40

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 2.21

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 8

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

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
ss	S1	24/19	0 -	4	1 2 2 2		SP	Moist, very loose to loose, brown and gray, fine SAND, trace roots.
SS	S 2	24/24		0	WOH WOH 3			Wet, very loose, brown and gray, fine SAND.
SS	S 3	24/20	<u>-2.8</u> 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	S 5	24/14	- <u>7.8</u>	5	1 2 3 4			Wet, loose, light brown, fine SAND, trace silt.
SS	S6	24/19	10	9	3 4 5			Wet, loose, light brown, fine SAND.
SS	S 7	24/18		11	5 3 5 6 10			Wet, medium dense, light brown, fine SAND, trace silt
SS		(DLANA	-12.8	E ABB	4 5 DE\//A	FIONS		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

HSA SSA HA AR DTR FR MR Air Rotary Dual Tube Rotary

Foam Rotary
Mud Rotary
Reverse Circulation
Cable Tool RC CT JET Jetting

Driving Drill Through Casing

SAMPLING TYPES:

Auger/Grab Sample California Sampler

AS CS BX NX GP HP 1.5" Rock Core 2.1" Rock Core Geoprobe Hydro Punch Split Spoon Shelby Tube Wash Sample

Above Ground

REMARKS

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

WOH = Weight of Hammer

Reviewed by: 1.5.4.

3/19/10



Client: Dare County

Proj	ect Locati		anoke	ısland,	NC			Project Number: 17952-71419
Туре	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.		SP	
ss	S 9	24/14		4	6 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.
			- <u>17.8</u> 20					
SS	S12	24/15		11	4 5 6			Wet, medium dense, gray, fine to coarse SAND, trace gravel, silt.
			- <u>22.8</u> 25		6			
ss	S13	24/4		11	4 5 6			Wet, medium dense, gray, fine to coarse SAND, trace gravel.
			- <u>27.8</u> 30		6			
			- -		5			Wet, medium dense, gray, fine to coarse SAND.
SS	S14	24/14	- <u>32.8</u> 35	15	6 9 8			
			_					Boring terminated at 35 feet below ground surface.
			_					



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-18-09 End: 12-18-09

Borehole Coordinates:

N 795,382.96 E 2,988,560.26

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 5.62

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 9

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

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
SS	S1	24/24	0 -	10	2 4 6 9	7 7 7 7 7 7	SP		h-thick grass, roots, and sandy TOPSOIL.
SS	S2	24/24		18	5 7 11 22				loose to medium dense, tan, fine SAND.
SS	S3	24/24	<u>0.6</u> 5	37	10 20 17 20			shell f	dense, tan and dark brown, fine to medium SAND, trace ragments, clay.
SS	S4	24/18	-	22	10 11 11 11		SP- SC	trace o	medium dense, tan and dark brown, fine to medium SAND, clay, gravel.
ss	S 5	24/16	-	10	4 4 6 5		SP	mediu	loose to medium dense, tan and dark brown, fine to m SAND, little clay, trace gravel.
ss	S6	24/20	-4.4 10	21	5 7 14			Wet, ı	medium dense, brown, fine SAND.
ss	S7	24/20		19	16 4 8 11 16			Wet,	medium dense, brown, fine SAND.
ss	E)	XPLANA	-9.4 ATION C)F ARR	9	TIONS	3	Wet,	medium dense, light brown and gray, fine SAND. REMARKS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger SSA HA AR DTR FR MR CT JET Air Rotary
Dual Tube Rotary Foam Rotary
Mud Rotary
Reverse Circulation

BOREHOLE ROANOKE ISLAND-PA

Cable Tool Jetting DTC Driving Drill Through Casing SAMPLING TYPES:

Auger/Grab Sample California Sampler 1.5" Rock Core 2.1" Rock Core AS CS BX NX GP HP

Geoprobe
Hydro Punch
Split Spoon
Shelby Tube
Wash Sample

Above Ground AGS -

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

Reviewed by: 1.5.4.



Client: Dare County

Proj	ect Locati	on: Ro	anoke	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	24/19	-9.4 15	25	15		SP	
ss	\$9	24/17		14	18 3 5 9			Wet, medium dense, light brown, fine SAND.
ss	S10	24/18		17	7 9 8 10			Wet, medium dense, light brown, fine SAND.
			- <u>14.4</u> 20		-			
ss	S12	24/20		9	5 5 4 8		SW	Wet, loose, dark brown, fine to coarse SAND, trace shell fragments.
		·	- <u>19.4</u> 25	-				
			_		2		GP	Wet, loose, brown and white, fine GRAVEL.
SS	S13	24/18	- <u>-24.4</u>	5	2 3 4	000]	
		-	30					
ss	S14	24/12	- <u>29.4</u>	10	3 4 6 5			Wet, loose to medium dense, brown and white, fine GRAVEL and fine SAND.
			35					Boring terminated at 35 feet below ground surface.

CAMP DRESSER & McKEE



BOREHOLE LOG B-7

Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-18-09 End: 12-18-09

Borehole Coordinates:

N 796,023.18 E 2,988,068.09

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 3.83

Total Depth (ft.): 40

Depth to Initial Water Level (ft. BGS): 7

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

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
			. 0		1	11. 18. 15	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		SM	Moist, loose, black and gray, fine SAND, little silt, organic material.
					1			Worst, 10050, Mack and gray, mile of the final only organic materials
ss	S3	24/21	- <u>1.2</u> 5	7	1 4 3 2		SC	Wet, loose, dark brown, fine to medium SAND, little clay.
		24/24			5			Wet, medium dense, dark brown, fine to medium SAND, little clay.
SS	S4	24/24		15	9 10	-	SP	Wet, medium dense, brown, fine SAND. Wet, loose, brown, fine SAND.
SS	S5	24/15	-62	9	3 4 5 6			vvet, icose, brown, inic ovitio.
SS	S6 _.	24/20	- 6.2 10	21	6 10 11			Wet, medium dense, gray and brown, fine SAND.
ss	S 7	24/17		5	12 1 2 3			Wet, loose, gray and brown, fine SAND.
-			-11.2		4 10	-		Wet, medium dense, gray and brown, fine SAND.
	EX	PLANA		F ABB	REVIA	TIONS	3	REMARKS
HSA	LING METHOD - Hollow Ster - Solid Stem - Hand Auge - Air Rotary - Dual Tube - Foam Rotar - Mud Rotary	m Auger Auger er Rotary iry			CS - C BX - 1 NX - 2 GP - G HP - F		b Sample Sampler Core Core	Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches

RC CT JET Cable Tool
Jetting
Driving
Drill Through Casing

- Auger/Grab Sample
- California Sampler
- 1.5" Rock Core
- 2.1" Rock Core BX NX GP HP SS ST WS Geoprobe Hydro Punch Split Spoon

Shelby Tube Wash Sample Above Ground

Reviewed by: 1.5.4.

3/19/10



Client: Dare County

Proj	ect Locati	i on : Ro	anoke I	sland, l	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	-11.2 15	24	14 18		SP	
					4			Wet, medium dense, gray and brown, fine SAND.
ss	S9	24/20		19	7 12			
				-	11 3	-		Wet, loose, gray brown, fine SAND.
SS	S10	24/18	46.2	9	4 5 5			Wet, loose, brown and gray, fine to medium SAND, trace gravel, silt.
			- <u>16.2</u> 20					
-					4) پر	GP/SP	Wet, medium dense, brown and gray, fine GRAVEL and fine
SS	S11	24/18		14	6 8 9		1	SAND.
			- <u>21.2</u> - 25					
	·						<u> </u>	
ss	S12	24/16			3 4			Wet, loose, brown and gray, fine GRAVEL and fine SAND.
	012	2-1110	- <u>26.2</u> 30	9	5			
		-	_			000		
			-	<u>.</u>				
SS	S13	24/18	-	6	3 3			Wet, loose, brown and gray, fine GRAVEL and fine SAND.
	-		- <u>31.2</u> 35		5			
			35) 	
			-). V. A.	
ss					1 2	000	SP	Wet, loose, brown, fine SAND, trace silt.



Client: Dare County

	Proj	ect Locati	on: Ro	anoke	Island, I	NC			Project Number: 17952-71419
	Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)		Blows per 6-inch	Graphic Log	S	Material Description
3	SS	S14	24/24		5	3 4		SP	
				- <u>36.2</u> 40		•			
				_ -			,		Boring terminated at 40 feet below ground surface.
					-				
				- <u>41.2</u> 45					
				-					
				- <u>46.2</u> 50					
2							-		
181/2 181/2				- <u>51.2</u> -55					
BOREHOLE ROANOKE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDJ 3/19/10				_					
ID-PACKAGE 2.0								-	
OANOKE ISLAN				- <u>56.2</u> 60	_				
BOREHOLE R				_					



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-18-09 End: 12-18-09

Borehole Coordinates:

N 796,224.96 E 2,987,906.32

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 2.33

Total Depth (ft.): 40

Depth to Initial Water Level (ft. BGS): 6

Abandonment Method: Grouted to ground surface

Field Screening Instrument: None

Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS	Material Description
			0		2	11 1/2 1/2	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			Moist, medium dense, black, fine SAND, some wood fragments, roots, trace silt.
20		24/24	-2.7		5 2 4			Moist, loose, dark brown, fine SAND, trace silt.
SS	\$3 	24/24	- -2.7 -	8	3			Wet, loose, dark brown, fine SAND, trace silt.
ss	S 4	24/24	_	3	2 1 2 2		SP- SM	Wet, very loose, brown, dark brown, fine SAND, little silt.
ss	\$ 5	24/16		14	3 6 8 10		SP	Wet, medium dense, light brown, fine SAND.
ss	S6	24/24	-7.7 10	22	6 10 12			Wet, medium dense, light brown, fine SAND.
ss	S 7	24/24		15	4 7 8 10			Wet, medium dense, light brown, fine SAND.
			-12.7		2			Wet, medium dense, white and light brown, fine SAND.
HSA SSA HA AR DTR FR MR CT JET	LING METHOD - Hollow Ster - Solid Stem - Hand Auge - Air Rotary - Dual Tube - Foam Rota - Mud Rotan - Reverse C - Cable Tool - Jetting - Driving - Drill Throug	m Auger Auger or Rotary ory / irculation	TION O		SAMPLING AS - A CS - C BX - 1 NX - 2 GP - G HP - H SS - S ST - S WS - V OTHER: AGS - A	G TYPES uger/Gra alifornia S 5" Rock 1" Rock ieoprobe ydro Pun plit Spool helby Tul Vash Sam	b Sample Sampler Core Core ch n pe	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:

EXPLANATION OF ABBREVIATIONS



Client: Dare County

Proj	ect Locat	ion: Ro	anoke	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	-12.7 15	12	8.		SP	
SS	\$9	24/13	<u> </u>	14	10 3 6 8 8		-	Wet, medium dense, white and light brown, fine SAND. Wet, medium dense, brown, fine to medium SAND.
SS	S10	24/24	- <u>17.7</u> _20	9	3 4 5 7			Wet, loose, brown, fine to medium SAND.
			-		4.			
ss	S11	24/16		7	1 3 4 5	000	SP GP/SP	Wet, loose, brown, fine to coarse SAND, some gravel, trace silt. Wet, loose, brown and gray, fine GRAVEL and fine SAND.
			<u>22.</u> 7 _ 25					
SS	S12	24/12	 - 27.7 -	3	2 1 2 3			Wet, very loose, brown and gray, fine GRAVEL and fine SAND.
ss	S13	24/18	_ 	11	3 4 7 6			Wet, medium dense, brown and gray, fine GRAVEL and fine SAND.
			32.7 					
+		:			3 4	60 C	SP	Wet, medium dense, gray, medium to coarse SAND.



Client: Dare County

Proj	ect Locati	on: Ro	anoke	Island,	NC				Project N	Number: 17	7952-71419
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				
			- <u>37.7</u> 40								
			-						Boring termin	nated at 40 fe	eet below ground surface.
			<u> </u>								-
					:						
			- -								
			-	-							
		:	- <u>42.7</u> 45								
									•		
. :											
			-								
			-								
			-		-						
			- <u>47.7</u>								
			50								
			ļ .								
			-								
			-								
,				<u> </u> .							
			- <u>52.7</u> - <u>55</u>								
			55				ļ	-	•		
			-	1							
			-	-							
			[
			- <u>57.7</u> 60	-							
			-	-							
			-	-	,						



Client: Dare County

Project Location: Roanoke Island, NC

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-17-09 End: 12-17-09

Borehole Coordinates:

N 796,615.02 E 2,987,518.43

Surface Elevation (ft.): 2.73

Total Depth (ft.): 30

Depth to Initial Water Level (ft. BGS): 2

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

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
			0		2	71 12 1	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.
			T . 1		2		SP	Wet, loose, light brown, fine SAND, trace clay.
ss	S2	24/17		5	3			
			_		4			Most loans limbs become fine CAND trees along
					1			Wet, loose, light brown, fine SAND, trace clay.
ss	S 3	24/21	<u>-2.3</u> 5	7	5 6			
			-		5	-		Wet, loose to medium dense, light brown, fine SAND, trace clay.
ss	S4	24/21	-	10	5 5			
			_		5			Wet, loose, white to gray, fine SAND, trace gravel, silt.
ss	S 5	24/14		5	3 3			
			- <u>7.3</u> -		2	1		Wet, loose, white to gray, fine SAND.
SS	S6	24/18		6	3			
			ļ		3			Wet, very loose, white to gray, fine SAND.
					1			vvet, very loose, writte to gray, title ortivo.
SS	S7	24/16	<u> </u>	3	1			
					2			
			-		1			Wet, very loose, white to gray and light brown, fine SAND.
	 F	 (PLANA	-12.3 TION O	F ΔRR	REVIA	TIONS	<u>: </u>	REMARKS
DRIL HSA SSA HA AR DTR FR MR	LING METHOD - Hollow Ster - Solid Sterr - Hand Aug - Air Rotary	S: m Auger Auger er Rotary ary			SAMPLIN AS - A CS - C BX - 1 NX - 2 GP - C HP - F	G TYPES	b Sample Sampler Core Core	Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches

EXPLANATION OF ABBREVIATIONS

Hand Auger Air Rotary Dual Tube Rotary Foam Rotary HA AR DTR FR MR CC CT JET Mud Rotary Reverse Circulation Cable Tool

Jetting Driving Drill Through Casing

AS CS BX NX GP HP SS ST WS Hydro Punch Split Spoon Shelby Tube Wash Sample OTHER: AGS -Above Ground

Reviewed by: 1.5.A.



Client: Dare County

Proje	ect Locati	on: Ro	anoke	Island,	NC				Project Number: 17952-71419
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	-12.3 15	2	1 2		SP		
			-		1		SW		Wet, very loose, brown, fine to coarse SAND.
ss	S 9	24/12	-	3	2 1 1				
			-		1	٥	SP		Wet, very loose, brown, fine to coarse SAND, little gravel.
ss	S10	24/10		3	1 2 3	∘ ()) ⊘			
			- <u>17.3</u> 20		3	0			
) O			
			-			。 (<u>)</u>			
			† .		1 2	600	GP		Wet, loose, brown and white, fine GRAVEL, some medium to coarse sand.
SS	S11	24/12	-	5	3 4	000			
_			- <u>22.3</u> 25			0.00			
			-	1		0.00	ķ		
				_		900			
			+		3 6				Wet, medium dense, brown and white, fine GRAVEL, some medium to coarse sand.
ss	S12	24/20	-	24	18		SP	\dagger	Wet, medium dense, brown, fine SAND
		ļ	- <u>27.3</u>		24		SP		Wet, medium dense, gray, fine SAND, some shell fragments.
			30						
			-						Boring terminated at 30 feet below ground surface.
			-						
			-	-					
			20.0						
	* 4		<u>32.3</u> 35	1					
		1	-	-					
			_						
						j			
			-	7					



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-17-09 End: 12-17-09

Borehole Coordinates:

N 796,904.65 E 2,987,299.53

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 3.64

Total Depth (ft.): 30

Depth to Initial Water Level (ft. BGS): 4

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS	Material Description
ss	\$ 1	24/24	0 -	10	3 5 5 5	<u> </u>	TS SP	6-inch-thick grass, roots, and sandy TOPSOIL. Moist, loose to medium dense, brown, fine SAND.
ss	S2	24/19	- -	5	2 3 2 3			Moist, loose, light brown, fine SAND.
ss	S 3	24/24	<u>-1.4</u> 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	S 5	24/18	-6.4	10	4 5 5 7			Wet, loose to medium dense, light brown, fine SAND.
SS	S 6	24/16	10	14	5 6 8			Wet, medium dense, light brown, fine SAND.
ss	S 7	24/24		5	2 3 2 2			Wet, loose, light brown, fine SAND.
		(PLANA	-11.4	E ADD	1 WOH			Wet, very loose, dark brown, fine to medium SAND, trace gravel, silt.
DRIL HSA SSA HA AR DTR FR MR RC	LING METHOD - Hollow Ster - Solid Sterr - Hand Aug - Air Rotary	OS: em Auger n Auger er Rotary ary	ATION C	; ; ;	SAMPLIN AS - A CS - 0 BX - 1 NX - 2 GP - 0 HP - H	G TYPES Auger/Gra California : 1.5" Rock 2.1" Rock Geoprobe Hydro Pur Split Spoo	i: b Sample Sampler Core Core	Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches WOH = Weight of Hammer

HSA SSA HA AR DTR FR MR CCT JET D DTC Air Rotary Dual Tube Rotary Foam Rotary
Mud Rotary
Reverse Circulation
Cable Tool

Jetting Driving Drill Through Casing

BOREHOLE

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core
GP - Geoprobe AS CS BX NX GP HP SS ST WS

Hydro Punch Split Spoon Shelby Tube Wash Sample OTHER:

Above Ground Surface

Reviewed by: 1.5.4.

3/19/10



Client: Dare County

Proj	ect Locati	on: Ro	anoke	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	M aterial 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	- <u>16.4</u> 20	2	1 1 1		SP	Wet, very loose, brown and white, medium to coarse SAND, little gravel.
			_ 20 					
SS	S11	24/6	- <u>21.4</u> 25	1	1 WOH 1			Wet, very loose, brown and white, medium to coarse SAND, little gravel.
				-				
SS	S12	24/22	- <u>26.4</u>	25	7 12 13 23		SW	Wet, medium dense, fine to coarse SAND, some shell fragments.
			30					Boring terminated at 30 feet below ground surface.
			- - <u>-31.4</u> 35	-				



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-17-09 End: 12-17-09

Borehole Coordinates:

N 798,504.41 E 2,984,205.56

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 2.55

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 8

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

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
ss	S 1	24/19	0	12	4 6 6 2		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	S 2	24/24	_	10	2 4 6 5		SP	Moist, loose to medium dense, brown, fine SAND, little clay. Wet, loose to medium dense, brown, fine SAND, trace roots.
ss	S 3	24/24	- <u>-2.5</u> 5	13	4 6 7 8			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	7.5	4	2 2 2 1			Wet, very loose to loose, brown, black, and white, fine to medium SAND, trace silt.
ss	S6	24/24	10	6	2 3 3 4			Wet, loose, brown, fine to coarse SAND.
ss	S 7	24/16		3	1 2 1 4			Wet, very loose, brown, fine to medium SAND, trace silt.
	EV	PLANA	-12.5	E ADD	3 4	TIONS		Wet, loose, brown, fine to coarse SAND. REMARKS

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger SSA HA AR DTR Air Rotary Dual Tube Rotary

FR MR RC CT Foam Rotary Mud Rotary Reverse Circulation Cable Tool

Jetting.

JET D DTC Driving Drill Through Casing

Auger/Grab Sample California Sampler 1.5" Rock Core 2.1" Rock Core AS CS BX

NX GP HP Geoprobe Hydro Punch Split Spoon Shelby Tube

OTHER: Above Ground Surface

Reviewed by: 1.5.4.



Client: Dare County

	ect Locati		anone			T		
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		SP	
ss	S9	24/19	 	4	4 1 2 2 4	· 0	SP	Wet, very loose to loose, white and gray, fine to coarse SAND, little to some gravel.
ss	S10	24/18	- <u>-17.5</u> 20	4	2 2 2 3		SP	Wet, very loose to loose, gray, fine to medium SAND.
SS	S11	24/19	- <u>22.5</u> 25	56	16 30 26 20		SP	Wet, very dense, gray, medium to coarse SAND, some shell fragments, little gravel.
			-		14			Wet, dense, gray, medium to coarse SAND, little shell fragments,
SS	S12	24/22	- <u>27.5</u> 30	32	15 17 20			gravel.
			_	_				
SS	S13	24/24	-32.5	34	9 15 19 36	V. C	SP	Wet, dense, brown and gray, medium SAND, trace shell fragments, gravel.
			35	-				Boring terminated at 35 feet below ground surface.
			_					



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-17-09 End: 12-17-09

Borehole Coordinates:

N 798,589.79 E 2,984,121.24

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 4.06

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 6

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

Logged By: P. Sudkamp

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS	Material Description
			0		1	71 1/2		6-inch-thick grass, roots, and sandy TOPSOIL.
ss	S 1	24/20		7	2 5 6		SP	Moist, loose, light brown, fine SAND.
			† †		4			Moist, loose to medium dense, light brown, fine SAND.
ss	S2	24/16	_	10	4 6 8		SC	Moist, loose to medium dense, gray, fine to medium SAND, little to some clay, trace roots, wood fragments.
ss	S3	24/19	<u>-0.9</u>		4 5			Moist, medium dense, gray, fine SAND, little clay, trace roots, wood fragments.
33		24/19	5	13	8 8		SP	Moist, medium dense, gray and brown, fine SAND.
ss	S4	24/18		2	1 1 1	••••	sw	Moist, very loose, gray and brown, fine SAND. Wet, very loose, brown to dark brown, fine to medium SAND, trace
			_		3			roots. Wet, loose, dark brown, fine to medium SAND.
SS	S5	24/20		7.	3 4 4			
SS	\$6	24/24	10 -	7	3 3 4			Wet, loose, dark brown, fine to medium SAND.
ss	S 7	24/24		1	1 WOH	· ()	SP	Wet, very loose, dark brown, fine to coarse SAND, some gravel, trace silt.
			-10.9		woh	, O		
SS	F	(PI ANA	-10.9 TION O	F ARR	REVIAT	rions		REMARKS

DRILLING METHODS: HSA SSA Hollow Stem Auger Solid Stem Auger Hand Auger Air Rotary Dual Tube Rotary Foam Rotary

ROANOKE ISLAND-PA

HA AR DTR FR MR RC CT JET D Mud Rotary Reverse Circulation Cable Tool Jetting

Driving Drill Through Casing

SAMPLING TYPES:

Auger/Grab Sample California Sampler 1.5" Rock Core AS CS BX 2.1" Rock Core

NX GP HP SS ST WS Geoprobe Hydro Punch Split Spoon Shelby Tube Wash Sample

OTHER: AGS -Above Ground Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches

WOH = Weight of Hammer

Reviewed by: 1.5.4.



Client: Dare County

		70			ج	1		
Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet) -10.9	N-Value	Blows per 6-inch	Graphic Log	ᅙ	Material Description
			15	-		。 。 。	SP	
)		
						0		
						00	1 1	
					3		SP	Wet, loose, light gray, fine to medium SAND, trace silt.
ss	S8	24/14	-	7	4			
			- <u>15.9</u> 20		4			
			20					
			_					
					!			
			_					
					7 12		SP	Wet, medium dense, gray and light brown, medium to coarse SAND, little shell fragments.
SS	S9	24/24	_	27	15			
			- <u>20.9</u> 25		18			
		-	-					
		-			11			Wet dense gray and light brown, medium to coarse SAND, little
00	040	04/04			19			Wet, dense, gray and light brown, medium to coarse SAND, little shell fragments.
SS	S10	24/21		38	19 25			
	<u> </u>		- <u>25.9</u> 30					
			<u> </u>	1			1	
						C		
			-		10		1	Wet, dense, gray, fine SAND, some shell fragments, trace gravel.
SS	S11	24/20	<u> </u>	35	14 21			
			-30.9	33	23	C		
			35					
			ļ	-				Boring terminated at 35 feet below ground surface.
		[].				
			-	1				



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-17-09 End: 12-17-09

Borehole Coordinates:

N 800,329.51 E 2,983,255.17

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 5.45

Total Depth (ft.): 25

Depth to Initial Water Level (ft. BGS): 3

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

Logged By: P. Sudkamp

'' '	500,329.51	L 2,50	0,200. 17					Logged By. F. Sudkamp
Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	ö	Material Description
			0		2	74 18 14	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	S 2	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			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	- <u>-4.6</u>	2	1 1 1 4			Moist, very loose, black and white, fine to medium SAND, little roots, wood fragments, trace silt.
SS SS	S6	24/16	10	9	2 5 4			Wet, loose, white, fine SAND.
KAGE 2.GPJ CDM_CORP.GDT	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.
E 2.0					2			Wet, loose, fine to coarse SAND, trace gravel.
CKAC	EV	DI ANA	-9.6 TION O	F ARRI	<u>4</u> RFVIΔ	TIONS	·!	REMARKS
HSA SSA HA AR	LLING METHOD A - Hollow Ster Bolid Stern Hand Auge Air Rotary Dual Tube Foam Rotar Mud Rotan Reverse C Cable Tool Jetting Driving	S: m Auger Auger er Rotary ary y irculation		\$, , , ,	SAMPLINAS - ACS - COS -	G TYPES	is Sample Sampler Core Core	Hammer weight = 140 pounds, drop height = 30 inches Split spoon length = 24 inches, diameter = 2 inches WOH = Weight of Hammer Reviewed by: 1.5.4. 3/19/10 Date:

EXPLANATION OF ABBREVIATIONS



Client: Dare County

Project Name: Roanoke Island Water System Improvements

Project Location: Roanoke Island, NC

Project Number: 17952-71419

Proj	ect Locat	i on: Ro	anoke l	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	24/16	-9.6 15	7	3		SP	
					4			
SS	S9	24/21	-	4	2 2 2 2	, O	SP	Wet, very loose to loose, dark brown, fine to coarse SAND, little gravel, trace clay.
s	S10	24/12		2	1 1 1 WOH	, O		Wet, very loose, white to gray, fine to coarse SAND, little gravel, trace clay.
			- <u>14.6</u> 20		VVOIT	。) ₀		
		-			_	。 。 ()		
					7 18	0	SP	Wet, dense to very dense, gray, fine SAND, little shell fragments, trace silt.
s	\$11 _.	24/21	- <u>19.6</u> 25	50	32 24			
			25					
								Boring terminated at 25 feet below ground surface.
						1		
			_					
			- <u>24.6</u> 30					
			-			!		
	٠		-	 -				
	*						-	
			-	,			ĺ	
			- <u>29.6</u> 35	_				
			35					
			-	1				
			-			,		
			-	1				
]					



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-17-09 End: 12-17-09

Borehole Coordinates:

N 800,595.72 E 2,982,897.55

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 4.87

Total Depth (ft.): 30

Depth to Initial Water Level (ft. BGS): 5

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

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
			0		2	71 1/2 1/2	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	\$3	24/21	- <u>0.1</u> 5	6	2 3 3		SP	Moist, loose, brown and gray, fine SAND, some silt, little clay. 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	-5.1	5	2 2 3 4			Wet, loose, light brown, fine to medium SAND, trace silt, roots.
SS	S6	24/19	10	8	3 4 4			Wet, loose, light brown and gray, fine to medium SAND, trace silt.
SS	S7	24/18	-	6	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.
	EX	(PLANA	TION O	F ABB	REVIAT	TIONS	,	REMARKS

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

Air Rotary
Dual Tube Rotary
Foam Rotary
Mud Rotary
Reverse Circulation
Cable Tool

Drill Through Casing

SAMPLING TYPES:
AS - Auger/Grab Sample
CS - California Sampler
BX - 1.5" Rock Core
NX - 2.1" Rock Core

AS CS BX NX GP HP SS ST Geoprobe Hydro Punch Split Spoon Shelby Tube Wash Sample OTHER:

Above Ground Surface

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

WOH = Weight of Hammer

Reviewed by: 1.5.4.



Client: Dare County

	ect Locati		anoke	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	-10.1 15	5	3		SP	
	-19.19				2	<u></u>	W/GP	Wet, very loose, brown, fine to coarse SAND and fine GRAVEL.
					-			
			٠.		1			Wet, very loose, brown, fine to coarse SAND and fine GRAVEL.
ss	S9	24/18		2	WOH 2			
			-15 1	_	WOH			
			- <u>15.1</u> 20				SP	Wet, very loose, gray, fine SAND.
			-	-	i			
	-			1	1			Wet, very loose, gray, fine SAND.
SS	S10	24/18			1			
1	0.0		20.4	3	2 2			
		-	- <u>20.1</u> 25					
			ļ.	-				
				1				
			+		2	1		Wet, loose to medium dense, gray, fine SAND.
SS	S11	24/18		10	3			
00	011	2-7/10	05.4	10	10	6	SP/GP	Wet, loose to medium dense, gray, fine SAND and SHELL FRAGMENTS.
		+	- <u>25.1</u> 30			17.72		FRAGMENTS.
			_	-				Boring terminated at 30 feet below ground surface.
		,		_		E		
				1				
			-	+				
			- <u>30.1</u> 35	1				
			-					
				1				
			-	-				



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-16-09 End: 12-16-09

Borehole Coordinates:

N 801,499.26 E 2,982,298.13

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 7.04

Total Depth (ft.): 25

Depth to Initial Water Level (ft. BGS): 5

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

Logged By: P. Sudkamp

0	01, 100.20	,00	,	-				
Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
		<u> </u>	0		2	11 × 12	TS	6-inch-thick grass, roots, and sandy TOPSOIL.
ss	S 1	24/24		3	2 1 3		SP	Moist, very loose, black and brown, fine SAND, trace silt.
ss	\$2	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	S 3	24/24	- <u>2.0</u> -	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			Wet, loose to medium dense, white and gray, fine SAND.
ss			-		6			
SS	S 7	24/17		6	1 3 3			Wet, loose, brown, fine to medium SAND.
			-8.0		3			
	F'	XPLANA)F ABB	REVIA	TION	S	REMARKS

EXPLANATION OF ABBREVIATIONS

BOREHOLE ROANOKE ISLAND-PA

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
MC - Reverse Circulation
CT - Cable Tool
JET - Jetting
D - Driving DTC Driving Drill Through Casing

SAMPLING TYPES: Auger/Grab Sample California Sampler BX NX GP HP SS ST WS 1.5" Rock Core 2.1" Rock Core Geoprobe Hydro Punch

Split Spoon Shelby Tube Wash Sample Above Ground AGS

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

Reviewed by: /.S./.

3/19/10 Date:



Client: Dare County

Pro	ject Locati	on: Ro	anoke l	Island, I	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	
			-					
			_		2	٠.٠	SW	Wet, loose, brown and gray, fine to coarse SAND, little gravel.
ss	S8	24/18	_	8	3 5			
			- <u>13.0</u> 20		5			
			-	,				
,						.a.:()		
					7		SP	Wet, medium dense, fine SAND, trace shell fragments.
SS	S9	24/14		20	13 18			
			- <u>18.0</u> 25					
			-					Boring terminated at 25 feet below ground surface.
			-					
			-	<u> </u>				
			-					
2		·	- <u>23.0</u>	1				
0								
15. 15.								
D I								
2.GPJ								
ACKAGE			-28.0					
BOREHOLE ROANOXE ISLAND-PACKAGE 2.GPJ CDM_CORP.GDJ 3/19/10			- <u>28.0</u> 35					
OKE ISI			-	1				
KOAN			-	-				
EHOLE			-	1				
ģ								



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-16-09 End: 12-16-09

Borehole Coordinates:

N 801,578.93 E 2,978,372.38

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 2.72

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 5

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

Logged By: P. Sudkamp

Sample Type	Sample Number	ber Ber	Description					
SS	S1	24/24	0	6	2 4			3-inch-thick grass, roots, and sandy TOPSOIL. Moist, loose, brown, fine to medium SAND, trace gravelFILL-
SS	\$2	24/18		15	7	××××	SP	Moist, medium dense, gray, fine SAND.
SS	S 3	24/18	<u>-2.3</u> 5	21	9		SC	Wet, medium dense, light gray, fine SAND, little clay.
SS	S 4	24/17		15	7		SP	Wet, medium dense, gray, medium SAND.
SS	S5	24/18	-7.3	17	6 11			
SS	S6	24/24	10	26	13 13			
ss	S 7	24/20		13	6		sw	Wet, medium dense, brown, fine to coarse SAND, trace gravel.
	EV	(DI ANA		F ARR	WOH	TIONS		Wet, very loose, brown, fine to coarse SAND, trace gravel. REMARKS
	LING METHOD - Hollow Ste	S: m Auger Auger	ATION O	;	SAMPLING AS - A CS - C	G TYPES	i: b Sample Sampler	Hammer weight = 140 pounds, drop height = 30 inches

DRILLING METHODS:
HSA - Hollow Stem Auger
SSA - Solid Stem Auger
HA - Hand Auger

SSA HA AR DTR FR Air Rotary Dual Tube Rotary Foam Rotary
Mud Rotary
Reverse Circulation
Cable Tool MR

RC CT JET

Jetting Driving Drill Through Casing DTC

AS CS BX SP HP 1.5" Rock Core 2.1" Rock Core Geoprobe
Hydro Punch
Split Spoon
Shelby Tube

Wash Sample Above, Ground WOH = Weight of Hammer

Reviewed by: 1.5.4

3/19/10



Client: Dare County

	nt: Dare (ect Locati	•	anoke	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	Material Description
SS	S8	24/22	-12.3 15	2	2		sw	
			- -		1 1 2		sw	Wet, very loose to loose, brown, fine to coarse SAND, little gravel.
SS	S9	24/12	-	4	2 2		SP/SW	Wet, very loose to loose, brown and white, fine GRAVEL and fine to coarse SAND.
		-	-		1	1,,,0	SP	Wet, very loose to loose, dark brown, fine SAND, trace silt.
ss	S10	24/13	17.3	4	2 2 4			
			- <u>17.3</u> 20					
			- ·		·			
				i	3	-		Wet, medium dense, grayish brown, fine SAND.
SS	S11	24/12	-	12	5 7			
,			- <u>22.3</u> 25	<u> </u>	8			
			_	_				
			_	_				
			<u> </u>		10		SP	Wet, dense, gray, fine to medium SAND, little shell fragments.
SS	S12	24/16	-	31	14 17			
			- <u>27.3</u>		15		1	
			_					
SS		· .	_	.		ن رن ر		
			<u> </u>		15	\bot $\langle \cdot \rangle$		Wet, dense, gray, fine to medium SAND, some shell fragments.
ss	S13	24/18	-	41	20 21			
			- <u>32.3</u> 35		23	, ,		
			-					Boring terminated at 35 feet below ground surface.
			-	-				
		٠.	_					



Client: Dare County

Project Location: Roanoke Island, NC

Drilling Contractor: GET Solutions, Inc.

Drilling Method/Rig: Mud Rotary/CME-35

Drillers: Dave Wikoff

Drilling Date: Start: 12-16-09 End: 12-16-09

Borehole Coordinates:

N 801,277.20 E 2,978,446.34

Project Name: Roanoke Island Water System Improvements

Project Number: 17952-71419

Surface Elevation (ft.): 3.01

Total Depth (ft.): 35

Depth to Initial Water Level (ft. BGS): 4

Abandonment Method: Backfilled with Bentonite Pellets

Field Screening Instrument: None

Logged By: P. Sudkamp

N O	01,211.20	L 2,31	0,-1-0.0	•				
Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
SS	S1	24/24	0 -	7	2 2 5 5		FILL	Moist, loose, brown and gray, fine to medium SANDFILL-
SS	\$2	24/20		7	3 4 3 3		SP	Moist, loose, brown and gray, fine to medium SAND. Wet, loose, black and white, fine SAND, trace silt.
ss	S3	24/24	<u>-2.0</u> _	13	2 5 8 11			Wet, medium dense, brown and dark brown, fine SAND, little roots, trace silt.
SS	S4	24/20	-	17	2 5 12 13			Wet, medium dense, brown and dark brown, fine SAND, little roots, trace silt. Wet, medium dense, brown, fine SAND.
ss	S5	24/20	-7.0	11	3 5 6 7			Wet, medium dense, brown, fine SAND.
ss	S6	24/21	10	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.
		YPI ANA	-12.0	DE ABB	2 1	TION	2	Wet, very loose, gray and brown, fine to medium SAND. REMARKS

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:

ROANOKE ISLAND-PA(

HSA SSA Hollow Stem Auger Solid Stem Auger

Hand Auger
Air Rotary
Dual Tube Rotary
Foam Rotary HA AR DTR FR MR RC CT JET

Mud Rotary Reverse Circulation Cable Tool Jetting

Driving Drill Through Casing

SAMPLING TYPES: Auger/Grab Sample
California Sampler
1.5" Rock Core
2.1" Rock Core
Geoprobe

AS CS. BX SP HP SS

Hydro Punch Split Spoon Shelby Tube Wash Sample OTHER: AGS -Above Ground

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

WOH = Weight of Hammer

Reviewed by: (. S.A.

3/19/10 Date:



Client: Dare County

		₇₆	1	ı	두		_	
Туре	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-inch	Graphic Log	USCS Classification	Material Description
s	S8	24/18	-12.0 15	3	2		SP	
		·			2 1 1			Wet, very loose, gray and brown, fine to medium SAND.
ss	S9	24/24		2	1 WOH		sw	Wet, very loose, dark brown, fine to coarse SAND, trace gravel.
7			- +		1	\$	sw	Wet, very loose, dark brown, fine to coarse SAND, some gravel.
ss	S10	24/19	17.0	3	2 1 4			
			- <u>17.0</u> 20					
	-				3	30:00	SP	Wet, loose, gray, fine SAND.
ss	S11	24/16	<u> </u>	8	3 5			
			- <u>22.0</u> 25		5			
			25					
			+ -		1			Wet, very loose, gray, fine to medium SAND.
SS	S12	24/10	1	3	1 2			
.			- <u>27.0</u> 30		 -			
	·							
SS	S13	24/18		42	10 20 22			Wet, dense, gray, fine SAND.
			- <u>32.0</u> 35		21		SP	Wet, dense, gray, fine SAND, some shell fragments.
			35					Boring terminated at 35 feet below ground surface.
			-					

Phase 3



PROJECT:	Roanoke	Island \	Water S	vstem Im	provements
11/00-011	I TOURIONS	ioidi id	•••••	,, 0.00111 1111	PICTOLLICITIO

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: US-64 at Etheridge

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Mud Rotary (Wash)

PROJECT NO.:

EC09-249G

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

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT DATE:

2/19/10

		B-	18 DEPTH TO WATER - INITIAL*: ₩ _7' AFTE	R 24 I	HOUF	RS: -	<u>*</u>		AVI	_	<u>C</u>
Elevation	Depth (meters)	Depth (feet)		Graphic			Sample Type		_	#200	TEST RESULTS Plastic Limit
	0	0	8 inches of TOPSOIL Tan-Gray, moist, poorly graded fine to medium SAND (SP), loose	/	1	18	SS	3 3 4 5	7		10 20 30 40 50 60 70
		5	Light Gray, moist, Silty fine SAND (SM) with trace clay, loose		3	16 16	ss ss	3 2 3 3 5	5 8		
		<u>_</u>	Tan, moist to wet, poorly graded fine to medium SAND (SP), loose t medium dense Wet from 7 feet	0	4	14	SS	5 3 3 4 3 3	7	0.5	•
		10			5	12 18	ss ss	3 4 5 3 5 5 7	7		
	4				7	14	ss	6 7 9 11 7	16		
		15			8	14	SS	11 13 15	24		
	6	20			9	14	SS	6 7 7 11	14		
	į .		Light Gray from 23 feet					6			
	8	25	Boring terminated at 25 ft.		10	16	SS	9 16 21	25		
	i										
	10	30					1				
		35			ì			į			

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

Notes:

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



BORING LOG R-19

PROJECT:	Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: US-64 at Airport

DRILLING METHOD: Mud Rotary (Wash)

DRILLER: GET Solutions, Inc.

EC09-249G PROJECT NO.: SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

2/19/10 DATE:

	-	B-		DEPTH TO WATER - INITIAL*: ₩					_			_	TES	T RESUL	TS	
(MSL) (II)	ت آ	Æ æ				Graphic	Sample No.	Sample Recovery	Sample Type	ws e	N-Value	#200	Plastic Lim			im
	Deptn (meters)	Depth (feet)		Description		rap	amp No.	am o	am Typ	Blows per 6"	-\ -	V	Moisture C			
ľ	ם בּ	<u>Д</u>				ပြ	Ŝ	S. Re	S	шч	Ż	%	N-Value -			
t	_	0											10 20 3	0 40 50	<u>60</u>	70
ŀ	0			8 inches of TOPSOIL	-	/ / / / /				2 .	·				:	:
			Once Tour	ist to wet, poorly graded fine to medium SAN			. 1	18	SS	2 3	5					:
			Gray-Tan, mo	led fine to medium SAND (SP-SM) with silt, I	loose to			-		5 5						•
١			poorly grad	medium dense		1311	2	20	ss	5 4	9					• :
r	-	l		Tan from 2.5 feet		:		,		3			//	<u>.</u>		. :
l	:	5						40	ٔ ہے ا	3 3		١				:
l						1-1:664	3	16	SS	3 3 4	6	0.8			:	:
l	2	<u> </u>				11.11	_			3	1					•
t		<u> </u>	<u>z</u>	Wet from 7 feet			4	18	SS	3 4	7	ľ	M			
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Ì			1	Light Gray from 23 feet		1116	1			7		ľ			:	
ı		-	┨				10	12	SS	14 15	25					
١		25	 	Boring terminated at 25 ft.		11:1:1:1	1	 -	1	13	1	1				• • •
ı	8	-	4	Doming terrimided at 20 ft.		1					1		:			٠.
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lo	tes:												SS = ST =	Split Spoo Shelby Tu Hand Aug Bulk Sam I = Weight	on San ibe Sa	1

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



BORING LOG B-20

PROJECT:	Roanoke Island	Water System	Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: US-64 at Brakewood

DRILLING METHOD: Mud Rotary (Wash)

DRILLER: GET Solutions, Inc.

SURFACE ELEVATION:

EC09-249G

PROJECT NO.:

LOGGED BY: P. Lankford, EIT

DATE:

2-19-10

(MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	Mois	tic Li sture	imit Con	⊢I I tent -		Lin
\dashv	. 0	0.							_		N-Va 10	alue 20		///// 40 5	//// 50 60	70
Ì			8 inches of TOPSOIL		1	16	ss	2 4	8			:::		:	: ;	:
			Gray-Brown, moist, Silty fine SAND (SM) with trace Organics, loose			10	33	4	0					. :	i	:
			Light Tan-Tan, moist, Silty fine SAND (SM), very loose		2	20	SS	3 2 2 3	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		3	16	SS	3 3 3 4	6	2.1		. • .				
	2	Ž	medium dense Wet from 6.5 feet		4	24	ss	3 5 7	12							
			Light Gray-Tan from 8 feet		5	12	ss	3 5 6 5	11							
		10		1000 0 0 1000 0 0 1000 0 0	6	18	ss	5 5 6 6	11							
	4			publika. anger albeka anguta:	7	13	SS	3 3 4	7							
		15		1100 0 1 1100 0 1 1100 0 0 1100 0 1	8	16	ss	3 4 4	8							
				1.00 k 1. 0.00 c 1. 0.00 c 1.				3			ZZI:					
			Tan from 18 feet	130 6 1 300 6 1 300 6 1	9	12	ss	1 1 2	3							
	6_	20						2	- -	1	4 :					
			Brown from 23 feet					1								
		25		11 11 11 11 11 11 11 11 11 11 11 11 11	10	14	SS	2 2 1	4							
	8		Boring terminated at 25 ft.		į.		÷									
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PROJECT:	Roanoke Island	Water System Im	provements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: US-64 at Amanda

DRILLING METHOD: Mud Rotary (Wash)

DRILLER: GET Solutions, Inc.

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

INA

LOGGED BY:

P. Lankford, EIT

DATE:

2/25/10

CAVING> C

		B-	21 DEPTH TO WATER - INITIAL*: $\forall \underline{4'}$ AFTE	N 24 F	JOUR	(S) =	₹ _		-/ A 11	10-	· C
چ چا				O	σ I	⊕≥	ω .		Φ	8	TEST RESULTS
Elevation (MSL) (ft)	Depth meters	Depth (feet)	Description	Graphic	Sample No.	Sample Recoven	Sample Type	Blows per 6"	N-Value	#200	Plastic Limit ⊢ Liquid Limit
<u> 할</u>	net De	<u>P</u> €	Description	Gra	Samp No.	San	Sar Ty	B B	ځ	> %	Moisture Content -
μ∈	J)	<u> </u>		<u> </u>		ى د			듸	^	N-Value -
	0	0	7	1111			-	2			10 20 30 40 50 60 70
			7 inches of TOPSOIL		1 ,	24	ss	3	6		
			Gray, moist, Silty fine SAND (SM) with clay and trace organics, loose				55	3 2	١		
		<u> </u>						2			
			Gray, moist, Silty fine SAND (SM), loose		2	20	SS	2 7	9		
		<u>z</u>	-					6 3			
		5	Gray-Tan, wet, poorly graded fine to medium SAND (SP) to poorly		3	22	ss	4	8		
		<u></u>	graded fine to medium SAND (SP-SM) with silt, very loose to loose					4		الما	
	2		Tan from 6 feet	iner t				3 1		1.1	
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No	tes:										SS = Split Spoon Sample
											SS = Split Spoon Sample ST = Shelby Tube Sample HA = Hand Auger Sample BS = Bulk Sample
			undwater reading may not be indicative of the static groundwater level.								BS = Bulk Sample WOH = Weight of Hammer

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



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: NA					
DRILLER: GET 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					

		B-	22	DEPTH TO WATER - INITIAL*: \(\noting\) 4' AF	TER 24	HO	JRS:	<u>*</u> _	c	AVI	NG:		
(MSL) (ft)	Depth (meters)	Depth (feet)		Description	Graphic	Sample	Sample	mple	Blows per 6"	N-Value	#200	TEST RE	Liquid Lim
SI G	a e	9Ğ (fe		Description	Ö	Sal	Sar	Sa	<u> </u>	ź	> %	Moisture Conte N-Value -	
Ţ	0	0			777			ļ	3	-		10 20 30 40	50 60 70
1			·	8 inches of TOPSOIL	-0.7 E	1	24	ss	4	10		//	
			Gray-Tan, mois silt to Silty fine	st, poorly graded fine to medium SAND (SP-SM) was SAND (SM), with trace organics, loose to medium	vith				. 5 8				
ŀ			<u>Z</u>	dense	4	2	17	SS	5 8 7	13	9.7		
		5	Gray-Tan, wet,	poorly graded fine to medium SAND (SP-SM), loc	ose itti	1) 1:1 3	24	ss	3 3 4	6			
\mid	2		Tan, wet,	poorly graded fine to coarse SAND (SP), loose	0	4	24	ss	3 4 5 5	9			
							12	ss	2 3 3	6	0.5		
\mid		10				+		-	3 4				
	,						5 16	SS	3 4 3	7			
-	4					<u> </u>	14	ss	3 4 4	7			
		15					3 16	ss	1 3 4	7			
ŀ			Tan, wet, poor	ly graded fine to medium SAND (SP-SM) with silt	-16 to		13	ss	5 5	11			
			Silty fir	ne SAND (SM), very loose to medium dense Light Gray from 18 feet			+		6 4				
ŀ	6	20				1	0 12	SS	6 7	11			
ŀ				Reddish Tan from 23 feet		_	-		3	$\frac{1}{2}$			
		25				1	1 12	SS	1 3 5	4			
-	8						1						
					-28		_	ļ	18				7
-		30	Tan, wet, poorl	ly graded fine to coarse SAND (SP) with Marine S Fragments, dense	Shell	1	2 16	ss	- 00	45			
				Boring terminated at 30 ft.									
	10										1		
		35	-										
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ot	es:											ST = Shell	Spoon Sample by Tube Samp I Auger Samp



PROJECT:	Roanoke Island	Water System	Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Stream at Battlefield

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Mud Rotary (Wash)

DEPTH TO WATER - INITIAL*: \(\noting\) 4' AFTER 24 HOURS: \(\noting\)

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT DATE:

CAVING> C

2-19-10

_	_	В-	DEPTH TO WATER - INITIAL*: \(\infty \) 4 AFTI	1	Т						TEST RESULTS	
(MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample Recover	Sample Type	Blows per 6"	N-Value	V N	Plastic Limit ⊢ Liquid Moisture Content - ● N-Value - /////// 10 20 30 40 50 60	
	0	0	7 inches of TOPSOIL		-			4 5			// : : : : : : : : : : : : : : : : : :	
			—0. Dark Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM with silt to Silty fine SAND (SM), with trace organics, medium dens		1	16	SS	6 5 7	11			
			Fan-Gray, moist to wet, Silty fine SAND (SM) with clay to Clayey fir SAND (SC) with silt, loose to medium dense Wet from 4 feet	e///	2	24	SS	6 5 3	11			
		5		6 11 1	3	10	ss	4 5 4 3	9	1.3		
	_ 2		Tan-Gray, wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt, loose	/ 11166 //////// 11076	4	24	SS	2 3 4	5			
		10		aside i nate nate	5	12	ss	2 3 4 3	7			
			Tan from 10 feet	100 61 100 61 100 61	6	20	ss	2 3 4 3	7			
	4			0.00 0.0 0.00 0.0 4.00 0.0 0.00 0.0	7	16	ss	3 5 4 5	9			
		15	Tan-Gray from 14 feet	11011111111111111111111111111111111111	8	12	ss	4 4 5 6	9			
					9	14	ss	3 4 4 4	8			
	6	20	Gray-Tan, wet, poorly graded fine to medium SAND (SP-SM) with to Silty fine SAND (SM), medium dense	silt	10	12	ss	5 6 6 8	12			
												• • •
		25	Tan, wet, poorly graded fine to medium SAND (SP) to poorly grad- fine to medium SAND (SP-SM) with silt, with Marine Shell Fragments, medium dense to very dense	i i i i	ird 11	14	ss	9 12 17 17	29			
	8		Fragments, medium dense to very dense	(1.0) (1. (1.2) (2. (1.2) (3. (1.2) (4. (1.2) (4.					-			
	į			9 10 1 9 10 6 9 10 10 1 10 10 1 10 10	11 12	16	ss	16 26 25	51			
		30	Boring terminated at 30 ft.	31 (1-1) 1.37.0				18				• • • • • • • • • • • • • • • • • • • •
	10	<u> </u>										
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						}		!				
												· · ·
No	tes:										SS = Split Spoon Sa ST = Shelby Tube S HA = Hand Auger Sa BS = Bulk Sample	3am



B-24

PROJECT:	Roanoke Island	Water System	Improvements
		-	

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: HWY-345 at Water Plant

SURFACE ELEVATION: LOGGED BY: DRILLER: GET Solutions, Inc.

DRILLING METHOD: Mud Rotary (Wash) AFTER 24 HOURS: 🐺 DEPTH TO WATER - INITIAL*: ♀ 3'

DATE: CAVING> C

PROJECT NO.:

EC09-249G

P. Lankford, EIT

2-23-10

TEST RESULTS Recovery N-Value Graphic Depth (meters) Sample No. Sample Blows per 6" Depth Plastic Limit ⊢ Liquid Limit Description Moisture Content -N-Value - 7//////// 10 20 30 40 50 60 70 7 inches of TOPSOIL 2 3 3 5 24 SS 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 SS 2 16 3 Tan, wet, Silty fine to medium SAND (SM) with clay to Clayey fine to medium SAND (SC) with silt, loose 4 SS 8 3 24 Tan, wet, poorly graded fine to medium SAND (SP), loose to medium 4 dense 3 24 SS 6 Brown from 7 feet Tan from 8 feet SS 5 5 14 3 10 4 5 6 6 18 SS 11 5 7 SS 10 12 6 8 15 24 SS Gray-Tan from 18 feet 9 12 SS 8 20 SS 8 10 14 25 Boring terminated at 25 ft. 30 10 SS = Split Spoon Sample ST = Shelby Tube Sample HA = Hand Auger Sample BS = Bulk Sample Notes:

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



PROJECT: Roanoke Island Water System Improvements		
CLIENT: CDM		
PROJECT LOCATION: Roanoke Island, North Carolina	PROJECT NO.:	EC09-249G
BORING LOCATION: HWY-345 at Baumtown	SURFACE ELE	VATION: <u>INA</u>
DRILLER: GET Solutions, Inc.	LOGGED BY:	P. Lankford, EIT
DRILLING METHOD: Mud Rotary (Wash)	DATE:	2-24-10

DRILLING METHOD: Mud Rotary (Wash)

CAVING> C AFTER 24 HOURS: ₹ DEPTH TO WATER - INITIAL*: ₩ TEST RESULTS Recovery Sample N-Value Graphic Depth (meters) Blows per 6" Sample Plastic Limit ⊢ Liquid Limit Description Moisture Content -N-Value - ///////// 10 20 30 40 50 60 70 6 inches of TOPSOIL 3 5 8 SS 12 Tan, moist, poorly graded fine to medium SAND (SP) with large root fragments, loose 5 3 2 SS 8 2 24 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 3 4 SS 7 3 24 Wet from 4 feet 6 9 15 4 24 SS 4 5 7 Gray-Tan, wet, poorly graded fine to coarse SAND (SP), loose to 5 24 SS 12 medium dense 6 7 9 6 20 SS 16 Tan from 11 feet 10 5 7 SS 16 SS 8 24 3 With fine Gravel from 18 feet 5 8 SS 11 6 3 4 6 10 10 SS 10 25 Boring terminated at 25 ft. 30 10 35



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

	$\overline{}$		DEPTH TO WATER - INITIAL*: ♀ 4' AFTE					_	Ť		TEST RESULTS
Depth (meters)	ء ہ	اہ ۽		Graphic	<u> </u>	Sample Recovery	e e	S.E	N-Value	#200	Plastic Limit H Liquid Lin
Depth (meters)	뒿	(feet)	Description	apt	Sample No.	ᇣᇲ	E Š	Blows per 6"	S	#	
عٌ تَ	ےٰاِ	មើ		Ö.	Sa	Sa Rec	Sa	മമ	żΙ	%	Moisture Content - ●
	1	_							-	_	N-Value - 7/////
0	┸	0									10 20 30 40 50 60 70
	ļ	ŀ	6 inches of TOPSOIL	44.4.4	١.	4.0	ss	2 5	10		
	F		Tan, moist, poorly graded fine to medium SAND (SP) to poorly	1 30 E 1	1	18	33	5 4	10		
	\vdash		graded fine to medium SAND (SP-SM) with silt; (Possible Fill), loose					2			
	L		·2.5		2	20	ss	2	3		.
	1	4	Black, moist to wet, Silty, Clayey PEAT (PT), very soft to soft		_			1			
	F	_ *	Wet from 4 feet					1			
	\vdash	5			3	10	SS	1	2		
	L					ļ		WOH			P
2	4	ı			. ,	١,	ss	WOH	0		L
.	Ė				4	1	33	WOH WOH	١٠		
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	L				5	7	ss	WOH	0		:::
L		10	40				<u> </u>	WOH			
			Reddish Brown, wet, poorly graded fine to medium SAND (SP-SM),		_	1	l	1 3		9.0	
1	\vdash		loose to medium dense		6	24	SS	· 3	6		
	\vdash			1.4.1.1.	-	 	-	3 6			
4	L			7:50 C C	7.	18	ss	7	15		////
	T			1911		'`	"	8 6	`		
	上						1	3	1		
	\vdash	15		100 C C	8	20	ss	3	6	ľ	
	L		Black, wet, Silty, Clayey PEAT (PT), very soft			<u> </u>	ļ	1	-		2
_	┨		Black, wet, only, Glayey 1 E/(1 1), voly solt		_	24	ss	1	2		
			17,5		9	24	33	1 1	_	İ	
	⊦		Gray, wet, Sandy Fat CLAY (CH), very soft	Y/	<u> </u>	<u> </u>	†	1	1		
	L			FIE 2: E	10	12	SS	1	2		
6	-[20	Dark Gray, wet, poorly graded fine to medium SAND (SP-SM) with			<u> </u>		1			1
İ			silt to Silty fine SAND (SM) with trace organics, very loose		·						
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L_	1						<u> </u>	1	-		b
					11	12	ss	1	3	Ì	
	Г	٥.	Gray, wet, poorly graded fine to coarse SAND (SP), very loose to	'	1 ''	٦ ' ا	"	2	ľ		
	+	25	loose			T	1		1		
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	t			.	\mathbf{f}^{-}			4 5	1	1	
	<u>-</u>		With Marine Shell Fragments from 29 feet	1:::::	12	16	SS	5	10	ļ	
	1	30			 	-	+	3	-	1	///
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10	4				\vdash	+	1	1	1	1	b
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		35	34.	5 1	1	L	ĹĨ	1	_ ا		
1	上	00	Dark Gray, wet, poorly graded fine to coarse SAND (SP) to poorly	្រាប់ក្រុងមួយ ព្រះព្រះព្រះ					1		
<u></u>	\dashv		graded fine to coarse SAND (SP-SM) with silt, with fine Gravel, ven		1				1	1	
	L		loose	1.1.6	1	1			1		
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This information pertains only to this boring and should not be interpreted as being indicitive of the site.

*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

PAGE 1 of 2



PROJECT: Roanoke Island Water System Improvements		
CLIENT: CDM		
PROJECT LOCATION: Roanoke Island, North Carolina	PROJECT NO.: _	EC09-249G
BORING LOCATION: Stream at Baumtown	SURFACE ELEVA	TION: <u>INA</u>
DRILLER: GET Solutions Inc.	LOGGED BY:	P. Lankford, EIT

DATE: DRILLING METHOD: Mud Rotary (Wash) CAVING> C

		D-		DEPTH TO WATER - INITIAL : # 4 AFTE	K 24 I			- _		AVII	_	
Elevation (MSL) (ft)	- (s	_			<u>.</u> 2	o o	Sample Recovery	e e	(n =	ω	% < #200	TEST RESULTS
atic _) (pth ters	et)		Description	Graphic	Sample No.	흔	ld d	Blows per 6"	N-Value	#2	Plastic Limit ⊢ Liquid Limit
S S	De	e P		Description	l ä	اق ح	E 3	ža	Be	≩	٧	Moisture Content - ●
≥ ш					1 0	ľ	ام چ	0,		_	%	N-Value - 7///////
									-			N-Value - ///////////////////////////////////
	12				000 b t : 1000 6 3	14	2	SS	1	3		
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—	' -		1		-		•			_	_	SS - Salit Sacon Sample

Notes:

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

*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

2-23-10



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Stream at Baumtown

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Mud Rotary (Wash) DEPTH TO WATER - INITIAL*: 😣

LOGGED BY: P. Lankford, EIT

EC09-249G

PROJECT NO.: _ **SURFACE ELEVATION:**

DATE: 2-23-10

Description Description Description Description Description Description Description Description Description Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with sit to Silly fine SAND (SIM) (Possible Fill), very loose Dark Grey, moist to wet, poorly graded fine to medium SAND (SP-SM) with organics, very loose Dark Grey, wet, Fat CLAY (CH), very solt Gray, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to medium dense Gray, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to medium dense Gray, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to medium dense Gray, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to medium dense With fine Gravel and Marine Shell Fragments from 23 feet With fine Gravel and Marine Shell Fragments from 23 feet With fine Gravel and Marine Shell Fragments from 23 feet Note: SS = Split Secon Sand Bare All (SP) and the state of th	J	<u>_</u> _)	27	DEPTH TO WATER - INITIAL*: \(\frac{1}{2}\) \(\frac{1}{2}\)	AFTER	-	-		_			_	TEST RESULTS	_
Tinches of TOPSOIL	Depth	Depth	(feet)	·	Description		Graphic	Sample No.	Sample Recover	Sample Type	Blows per 6"	N-Value		Plastic Limit ⊢ Liquid Moisture Content - N-Value -	
Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM); (Possible Fill), very loose 2 16 55 1 2 5 5 1 5 5 5 5 5 5 5	0	+			7 inches of TOPSOII		/ / / / /							10 20 30 40 50 60	
Dark Gray, moist to wet, poorly graded fine to medium SAND (SP) SM) with organics to Siliy fine medium SAND (SM) with organics. Wet from 4 feet Organic Content = 3,7% Dark Brown from 6 feet Tan, wet, poorly graded fine to medium SAND (SP), loose Gray, wet, Fat CLAY (CH), very soft 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 With fine to coarse SAND (SP-SM) with silt, very loose to medium dense With fine Gravel and Marine Shell Fragments from 23 feet SS = Soli Soor Sam				Tan-Gray, mois	st, poorly graded fine to medium SAND (SP-SI	0.6 M) with		1			2 3 2		·		!
Vivit from 4 feet Organic Content = 3,7% Dark Brown from 6 feet			5	Dark Gray, mo SM) with organ	ics to Silty fine to medium SAND (SM) with org	O (SP- ganics ,	**************************************				1 2 3		5.4	•	
Tan, wet, poorly graded fine to medium SAND (SP), loose Gray, wet, Fat CLAY (CH), very soft	2				Wet from 4 feet Organic Content = 3.7%		14,44,44,44,44,44,44,44,44,44,44,44,44,4				3 2 2				
Tan, wet, poorly graded fine to medium SAND (SP), loose Gray, wet, Fat CLAY (CH), very soft 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 Tan, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to coarse SAND (SP-SM) with silt, very loose to medium dense With fine to coarse SAND (SP-SM) with silt, very loose to medium dense With fine Gravel and Marine Shell Fragments from 23 feet Tan, wet, poorly graded fine to medium dense Tan, wet, poorly graded fine to coarse SAND (SP) to poorly graded fine to coarse			-			9:	**************************************				5 3				
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 solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt, very loose to medium dense solved fine to coarse SAND (SP-SM) with silt solved fine to coarse SAND (SP-SM) with sil			0	Tan, wet,		se 11-		6	24	ss	2	2	95.0		 Н
S Solit Spoon Samp Signature Signa	4					13	1:1:1:1	7	16	ss	3	6			
With fine Gravel and Marine Shell Fragments from 23 feet	ŧ		15	Gray, wet, poo fine to coarse s	ry graded fine to coarse SAND (SP) to poorly SAND (SP-SM) with silt, very loose to medium	graded dense	racio 1966 1966 1966	8	14	ss	3	5			
With fine Gravel and Marine Shell Fragments from 23 feet							0 20 0 1 7 A 5 A 7 A 7 E 6 A 7 Section 1	9	12	ss	0	1			
With fine Gravel and Marine Shell Fragments from 23 feet	6							10	6	ss	1	2			
25 30 Boring terminated at 30 ft. SS = Split Spoon Samu			20												
8		+		With fine	Gravel and Marine Shell Fragments from 23 fe	eet	AGEA AGEA AGEA AGEA	11	20	ss	4 8	12			
30 Boring terminated at 30 ft. 10 35 SS = Split Spoon Samu	8	_	25				nine i Herei arce e Meki								
30 Boring terminated at 30 ft. 6 2 35 35 35 35 35 35 35				,		•	1 1 1 1	12	24	ss	4 5	10			
35 35 SS = Split Spoon Samu			30		Boring terminated at 30 ft.			1							
toe:	10	_													
tes: SS = Split Spoon Sam			35												
tes: SS = Split Spoon Sam															
	tee:							_						SS = Split Spoon Sar	mı



PROJECT:	Roanoke Island Water S	ystem Improvements_	

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: HWY-345 at Old Wharf

DRILLING METHOD: Mud Rotary (Wash)

PROJECT NO.: SURFACE ELEVATION: _

EC09-249G

LOGGED BY: P. Lankford, EIT DRILLER: GET Solutions, Inc.

DATE:

2-24-10

DEPTH TO WATER - INITIAL*: ₩ 3' AFTER 24 HOURS: ¥ CAVING> C

چ چ		口			ပ	0	_ ≥	o)		ø	8	TEST RESULTS
Elevation (MSL) (ft)	Depth	e S	Depth (feet)	Description	Graphic	Sample No.	Sample Recoven	Sample Type	Blows per 6"	N-Value	#200	Plastic Limit ⊢ Liquid Limit
할힐	Ö	Ē	음의	Description	Gra	Sar	San	Sar T	필립	3	> %	Moisture Content - ●
		7					0, 12			_	<u>۰</u>	N-Value -
	0	_	0		, , , , ,				2			10 20 30 40 50 60 70
- 1				6 inches of TOPSOIL		1 1	24	ss	2 5 6	11		
				Gray, moist to wet, poorly graded fine to medium SAND (SP-SM)		'	2-7	00	6			
		ı		with silt to Silty fine SAND (SM), loose to medium dense					3			
-		4		Wet from 3 feet		2	16	SS	4	7		
		-		Dark Gray, wet, Silty fine SAND (SM) with clay and trace organics,					<u>2</u> 1			
			5	very loose		3	20	SS	1 2	-3	13.2	
		Į		6-					1			
	2	\dashv		Light Gray-Tan, wet, poorly graded fine to medium SAND (SP) to	11.00	4	16	SS	1 1	3		
		Ī		poorly graded fine to medium SAND (SP-SM) with silt, very loose to	11161	4	10,	33	2	3		
		ı		loose Tan from 8 feet					3 4			
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				Gray, wet, Clayey fine SAND (SC) with silt, loose		10	24	ss	2	7	Ì	
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			25	Boring terminated at 25 ft.	,,,,,,,,					1		
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Not	es	:										SS = Split Spoon Sample ST = Shelby Tube Sample
												HA = Hand Auger Sample BS = Bulk Sample
*Th	a in	itic	al aro	undwater reading may not be indicative of the static groundwater level.								BS = Bulk Sample WOH = Weight of Hammer

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Stream at Thicket Lump

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Mud Rotary (Wash)

DEPTH TO WATER - INITIAL*: \(\noting\) 2'

AFTER 24 HOURS: ₹

PROJECT NO.:

LOGGED BY:

EC09-249G

INA

SURFACE ELEVATION: P. Lankford, EIT

DATE: 2-22-10

CAVING> C

c =				- 6	<u>_</u>	_ ≥	Δ.		o	0	TEST RESULTS
Elevation (MSL) (ft)	pth ters	Depth (feet)	Description	Graphic	檀	Sample Recovery	npk 70	Blows per 6"	N-Value	#200	Plastic Limit ⊢ Liquid Limit
§ 5	ne De	e G	Description	g.	Sar	San	Sar T	Big	۱	> %	Moisture Content -
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	0	0	0		-	-		1			10 20 30 40 50 60 70
			6 inches of TOPSOIL 0.5		1	12	ss	0 2	2		
			Gray-Tan, moist to wet, Silty fine SAND (SM), very loose					3			
		•	Wet from 2 feet		2	24	SS	1	2		
			Brown, wet, Clayey fine SAND (SC) with silt, with trace organics,		1		00	1 1	-	32.5	
		5	very loose					2 2	_		
		-	Tan-Gray, wet, Silty fine SAND (SM), loose		3	24	SS	4	6		
	2		Tan, wet, poorly graded fine to coarse SAND (SP), loose to medium					2	ļ .		
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		15	Gray from 14 feet					4] _	Ì	
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			Gray, wet, poorly graded fine to medium SAND (SP-SM) with silt to		11	24	ss	2 6 9	15	Į.	
		25	Silty fine SAND (SM), medium dense		''	24	"	9 18	'`		
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	<u> </u>			9	12	16	SS	42_	75		<i>\{\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>
		30	Light Gray, wet, poorly graded fine to medium SAND (SP), very dense	 	+	+	+	53	1	1	
			Boring terminated at 30 ft.	1	1		l				
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No	tes:										SS = Split Spoon Sample ST = Shelby Tube Sample
											HA = Hand Auger Samble BS = Bulk Sample WOH = Weight of Hammer
*Th	a initi	al ar	undwater reading may not be indicative of the static groundwater level.								WOH = Weight of Hammer

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



DDA ICAT	D 1		O 4 1	provements
PROJECT	ROSPORE	siana wwater	System im	nrovements.
I INCOLOI.	I TOURIONG IS	sially vvalo	CYSICIII III:	

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Stream at Thicket Lump

EC09-249G SURFACE ELEVATION: INA

DRILLER: G E T Solutions, Inc.

LOGGED BY:

PROJECT NO.:

P. Lankford, EIT

DRILLING METHOD: Mud Rotary (Wash)

DATE: 2-22-10 CAVING> C

		B-	30	DEPTH TO WATER - INITI	AL*: \\ □ _1' AFTEI	R 24 H	IOUR	≀S: ∃	F _	c	AVII	VG>	<u> </u>				_
<u>⊊</u> £	<u> </u>					O	a l	თ ≥	e e	<i>(</i> 0 -	<u>o</u>	8		ST RE			
Elevation (MSL) (ft)	Depth (meters	Depth (feet)		Description		Graphic	Sample No.	Sample Recove	Sampl Type	Blows per 6"	N-Value	v,	Plastic Li Moisture N-Value	Conte			iit
	_	_											10 20	- 1222 30 40) -
	0_	0 -	}	6 inches of TOPSOIL	0 d	4444 4444	1	16	SS	1 0	1						
			Gray-Tan, mo	oist to wet, poorly graded fine to SM), very loose Wet from 1 foot	o medium SAND (SP-					1 0 WOH WOH		8.3					
:		5	Dark Gray-Brov	wn, wet, Silty fine SAND (SM)	with clay and organics,	100000	2	18	SS	WOH 1 2 2	0		3				
	2	5	Tan wet noor	ly graded fine to medium SAN	D (SP-SM) to Silty fine	2545	3	24	SS	3 4 3	5						,
				SAND (SM), loose			4	24	SS	4 4 5 3	8						
		10	Gray-Brown, w graded	et, poorly graded fine to mediu fine to medium SAND (SP-SM	im SAND (SP) to poorly I) with silt, loose		5	16	SS	4 5 5	9						· · ·
						1000 C 1 1100 C 1 1100 C 1 1100 C 1	6	22	ss	5 5 7 2	10						
	4			Gray, wet, Sandy Fat CLAY (0	13 CH), soft		7	18	ss	1 2 3	3						
		15	Light Gray, we	et, poorly graded fine to mediu	m SAND (SP) to poorly		8	16	ss	4 6 8 7	14						
			graded fine	to medium SAND (SP-SM) w medium dense Gray from 17.5 feet	ith silt, very loose to	nie c i fun e i ang c	9	12	ss	2 3 3 4	6						
	6	20		Dark Gray from 19 fee	ıt .	ranta Tanta Tanta Tunta	10	12	ss	2 2 1 5	3						٠٠.
			:														
						1-16 6 6 11-16 6 6 1-16 6 1				2 3							
		25	Gray	, wet, Clayey fine SAND (SC)	with silt, loose		11	10	SS	2 3	5						
	8																
	-				29		12	14	ss	4 6 6	12						
		30	ran, wet, poo	rly graded fine to medium SAN Boring terminated at 30						9							
	_10					-									 		
		35											<u></u>				
				1													
	tes:		•	n may not be indicative of the state									ST HA BS	= Split = Shelt = Hand = Bulk)H = We	oy Tube I Auger Sample	Samp Samp	le le

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

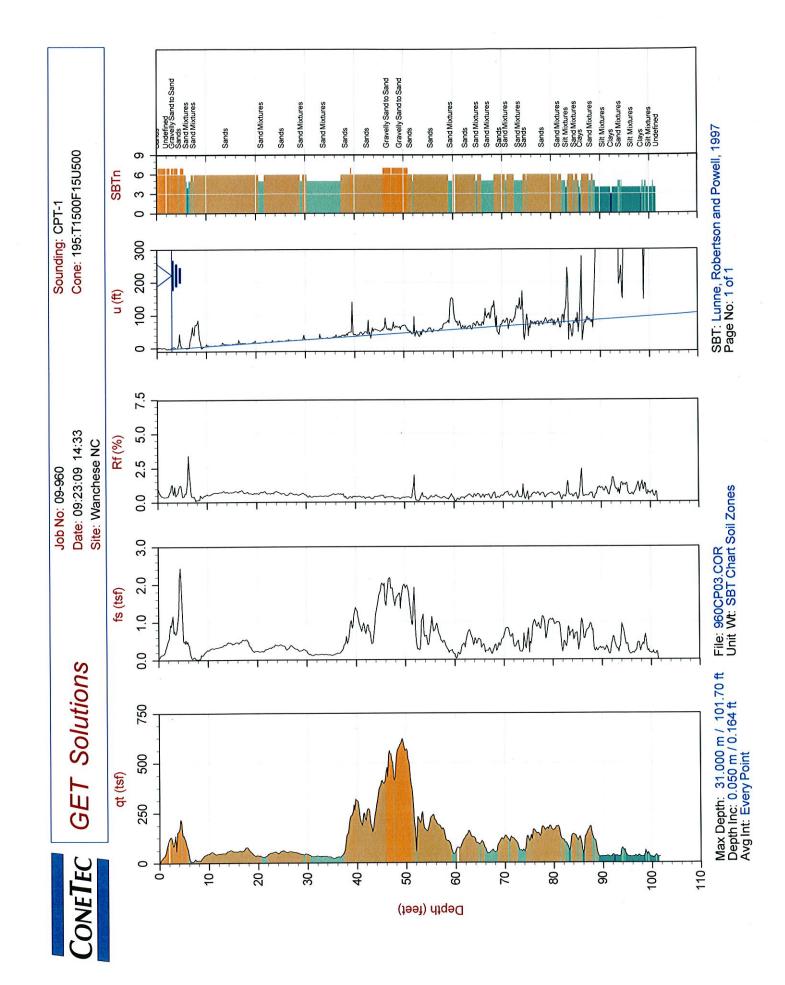


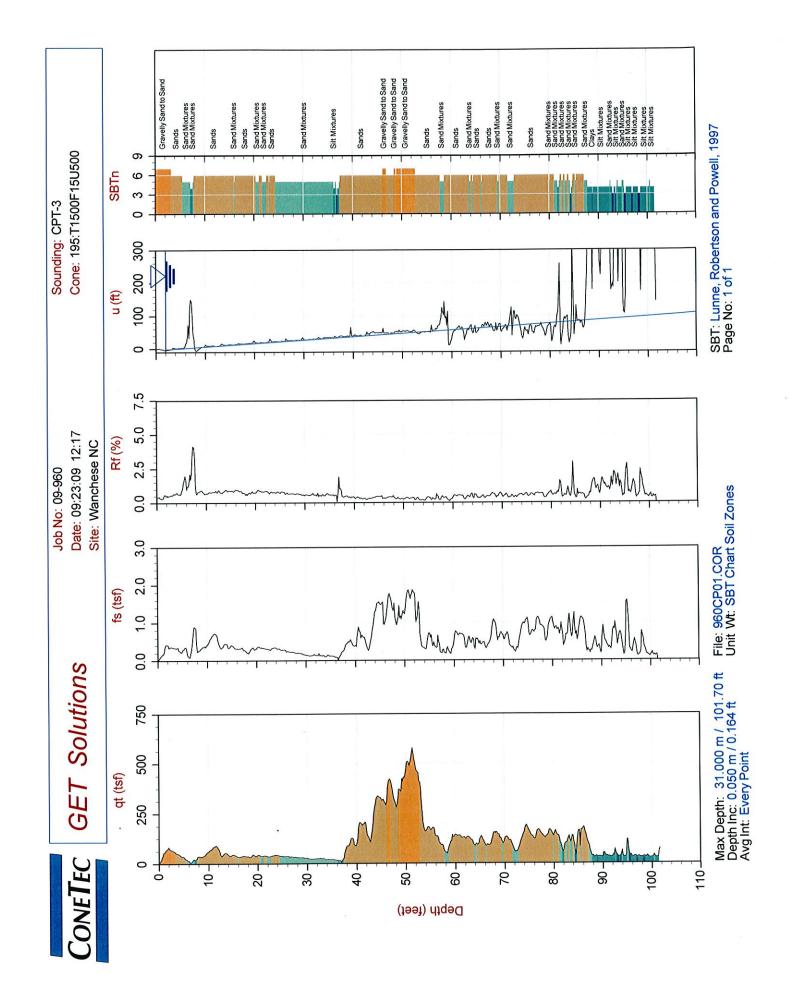
Water table during drilling

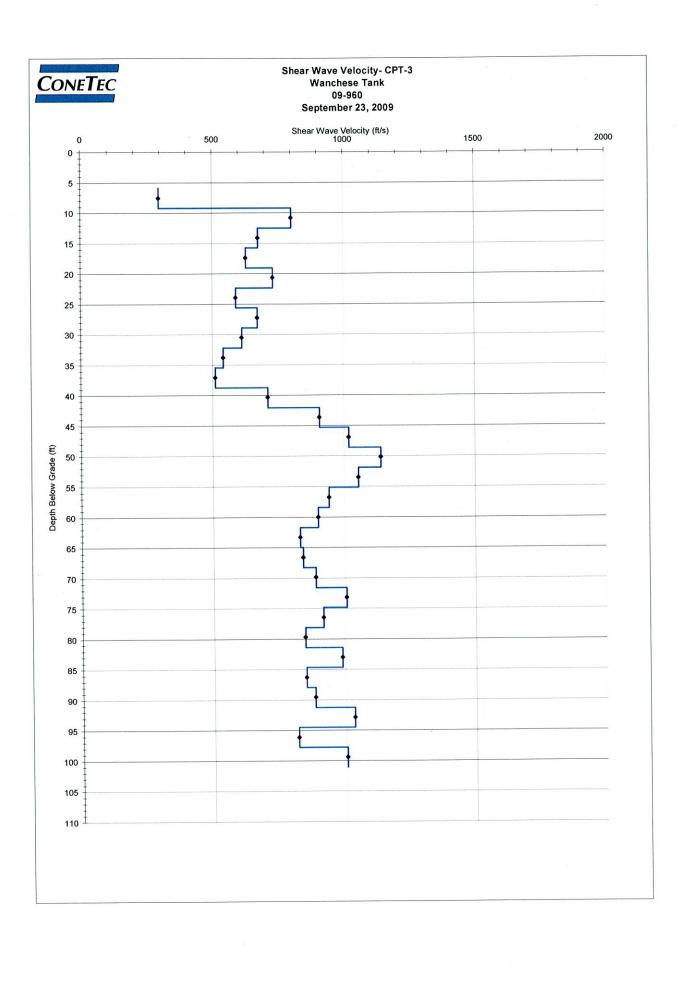
Notes:

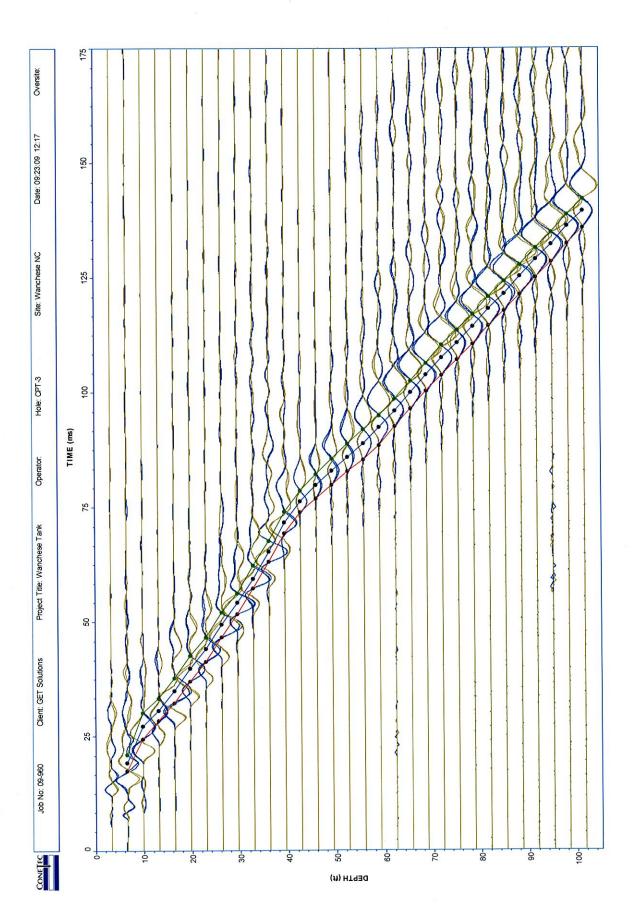
- 1. Exploratory borings were drilled on 2-22-10 using a 4-inch diameter continuous flight power auger.
- 2. No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design 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.

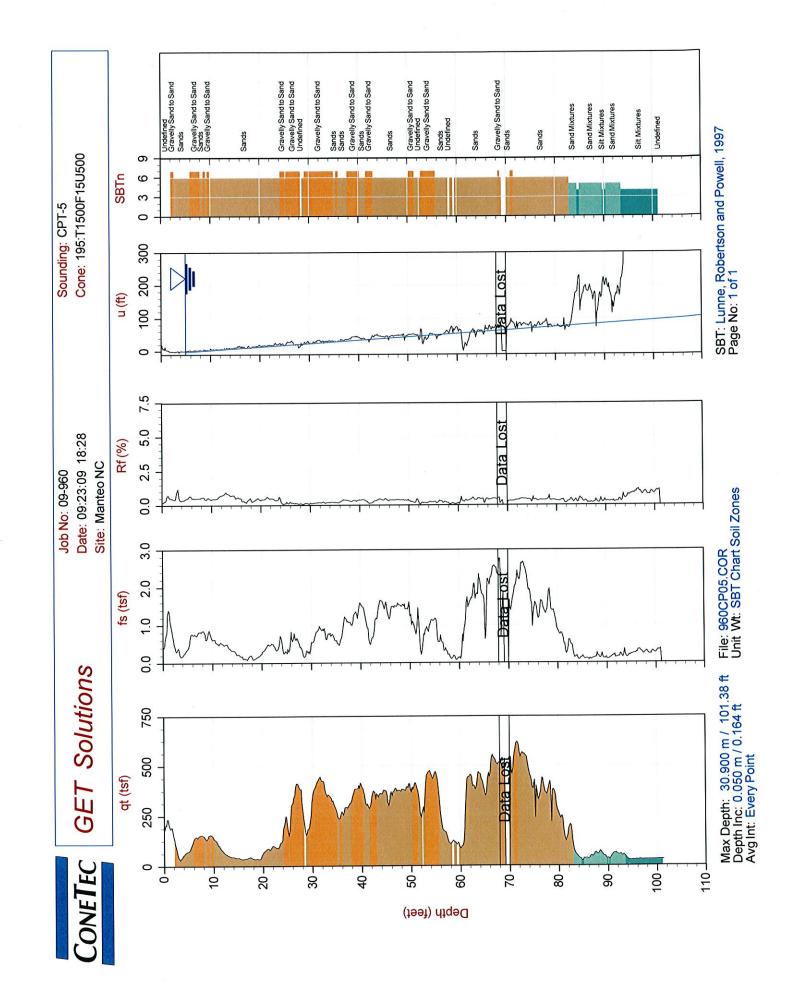
Appendix BCPT Soundings

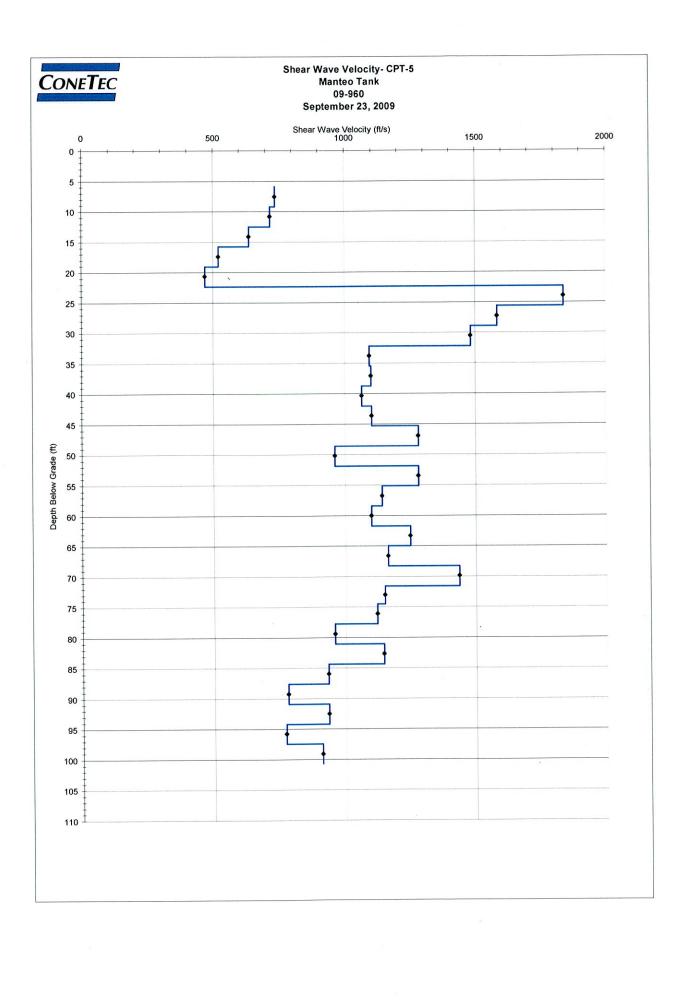


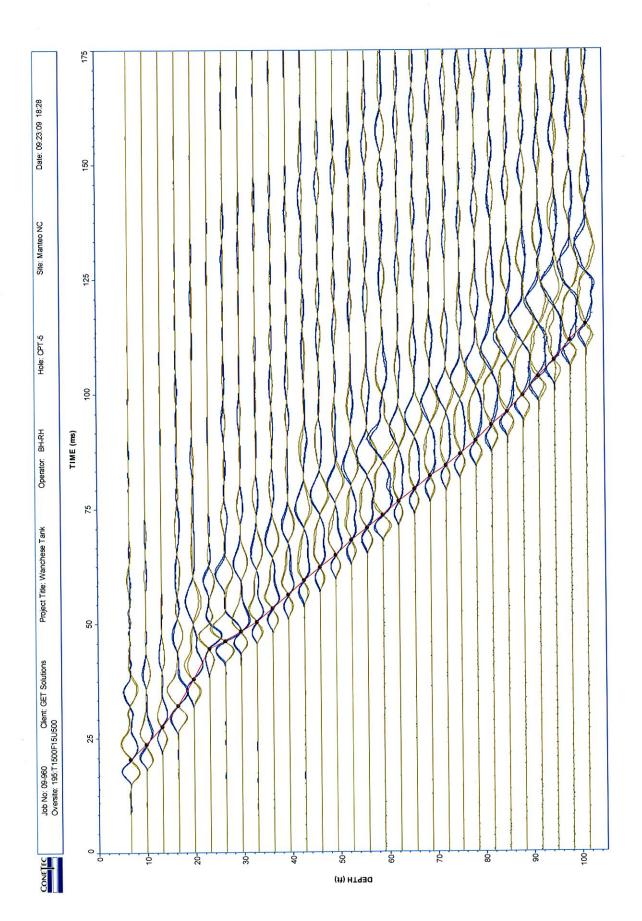












Appendix C Hand Auger Boring Logs



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Vista Lake

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DATE:

PROJECT NO.:

LOGGED BY:

SURFACE ELEVATION:

12-29-09

P. Lankford, EIT

EC09-249G

INA

l		HA	1 DEPTH TO WATER - INITIAL*: \(\forall \) 2' AFTE	R 24	HOU	RS:	* _	<u> </u>	AVI	NG:	<u>C</u> 4.5'
Elevation (MSL) (ft)	Depth (meters)			Graphic	Sample	Sample	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - □
,	0	0	Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt to Silty fine SAND (SM); (FILL)		, , , , , ,		HA				10 20 30 40 50 60 70
	0.4	1	Black, moist, Sandy TOPSOIL				НА				
	-	2 \	Z Gray-Tan, wet, Clayey fine SAND (SC) with silt				НА		-		
	0.8	3									
			Gray-Tan, wet, Silty fine SAND (SM) with clay			z .	HA		i i	c .	
	1.2	4	Boring terminated at 4.5 ft.								
	1.6	5									
	2	6.		, -							
		7									
									,		

Notes:

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

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



BORING LOG HA-2

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Viccars

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: ♀ _3' AFTER 24 HOURS: ₹

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: LOGGED BY: P. Lankford, EIT

DATE:

12-29-09

5.5 CAVING> C

<u> </u>			T-Z DEFINITIONALENTIAL : 5 3 ATT								
Elevation (MSL) (ft)	ر (s	ا _ ا		<u>.</u> .2	<u>o</u>	e ≥	Sample Type	ω =	N-Value	% < #200	TEST RESULTS
aţi.	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	급증	Ide (Blows per 6"	alı.	#2	Plastic Limit ⊢ Liquid Limit
S €	a E	윤	Description	l Ë	sar N	ec 절	ža 🗆	[표 원	₹	Ň	Moisture Content - ●
⊒ €	I)				٠,	S	3		1	%	N-Value -
	0	0									10 20 30 40 50 60 70
		_	Tan-Gray moist Silty fine SAND (SM) mixed with Grayel	$\rightarrow \!$	1		НА			l	
			Tan-Gray, moist, Silty fine SAND (SM) mixed with Gravel; (Uncontrolled Fill)	$\otimes \otimes$	1					i	
			(Onsolitions of in)	$\times\!\!\times\!\!\times$	1						
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				$\times\!\!\!\times\!\!\!\times$	1					1	
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	 	2		2	7		HA	1			L
	Ì		Gray, moist to wet, Silty fine SAND (SM)						1	l	
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		<u> </u>						[l	l	-
	0.8	•	Tan from 2.5 feet			1		İ		l	Liniaiaiaiaiaiaiai
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		3 2	7					•	1		L. i. i. i. i. i. i. i. i. i. i. i. i. i.
	1	7	Wet from 3 feet								
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		<u></u>									L iiiiiii
				5		1	HA	l		l	
			Tan-Reddish Tan, wet, Clayey fine SAND (SC) with silt		1		1 "	l			
					{			1	1		
	1.2	4		. 7//	1	l					
			Tan-Reddish Tan, wet, Silty fine SAND (SM)	4	1	i	HA				
ŀ		⊢	Tail-itedulati fait, wet, only fine OAND (ON)					l		l	
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1		L.			1	1	1	1	1		Liiiiiii
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		\vdash	Boring terminated at 5.5 ft.	1	1		1		1	1	
	1	L	<u> </u>		i	1	1		1		
	<u> </u>	6			1				1	1	
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T	400:		<u>- </u>	-		•		-	-		SS = Split Spoon Sample

Notes:

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

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.



BORING LOG HA-3

PROJECT:	Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: California

DRILLER: GET Solutions, Inc. **DRILLING METHOD:** Hand Auger PROJECT NO.:

EC09-249G SURFACE ELEVATION:

LOGGED BY:

P. Lankford, EIT

DATE:

12-29-09

		HA	1-3 DEPTH TO WATER - INITIAL*: ₩ 1' AF	ER 24	HOU	RS:	* _	c/	VIN	IG>	<u>C</u> 3'
Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample	Sample	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit
	0	. 0	8 inches of TOPSOIL	1444							10 20 30 40 50 60 70
			o inches of TOP SOIL	/	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
		1 5	Tan, moist to wet, poorly graded fine to medium SAND (SP-SM) Silty fine SAND (SM) Wet from 1 foot	o	**************************************		HA				
	0.4		· · · · · · · · · · · · · · · · · · ·								
		2									
						•					
	0.8							n.			
		3 (Boring terminated at 3 ft.		4						
	1.2	4									
		5									
	1.6		·								
		6							.		
	2										
		7									
							•				
<u> </u>						1					

Notes:

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

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



BORING LOG $H\Delta_{-4}$

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Fernando

DRILLER: GET Solutions, Inc. **DRILLING METHOD:** Hand Auger PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA LOGGED BY: P. Lankford, EIT

DATE:

12-29-09

		HA	_	PTH TO WATER - INITIAL*: \(\frac{14}{2} \)	AFTER	₹ 24 F	IOUF	RS: -	¥ _		٩VI	_	<u>C</u> 4.5'
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 - ✓///////////////////////////////////
	0	0				, , , ,							10 20 30 40 50 60 70
				12 inches of TOPSOIL		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				:			
		1				, , , ,							
	0.4		Light Gray,	moist, Clayey fine SAND (SC) with silt	'			1	HA				
			•										
		2			2-			:	НА				
			Light Gray, moist to SM)	o wet, poorly graded fine to medium SAN with silt to Silty fine SAND (SM)	ID (SP-				115				
	0.8		<u>Z</u>	Wet from 2.5 feet						:			
		3											
		 							:				
			Tan, wet, p	oorly graded fine to medium SAND (SP)	3.5				HA	E	i i	t	
	1.2	4											
		<u> </u>						ŀ					
				Boring terminated at 4.5 ft.									
		5											
	1.6	-						i					
													-
		<u> </u>											<u> </u>
		6	·							į			
	2	├—											
		7											
No.	tes:		<u> </u>				' -			<u> </u>			SS = Split Spoon Sample

Notes:

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

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



BORING LOG HA-5

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Cross

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA

LOGGED BY: P. Lankford, EIT

DATE:

12-29-09

		HA	\- 5	DEPTH TO WATER - INITIAL*: ₩ 2.5' AI	FTER 24 I	HOU	RS:	¥ _	CA		G> .	C 6'
(MSL) (ft)	Depth (meters)	Depth (feet)		Description	Graphic	Sample	Sample Recovery	Sample Type	Blows per 6"	N-Value	y M	TEST RESULTS astic Limit ⊢ Liquid Limit oisture Content - ● -Value - ////////
	0	0		18 inches of TOPSOIL	/ / / / / / / / / / / / / / / / / / /							10 20 30 40 50 60 70
			•		/							
	0.4	1				, , ,						
		2	·	-Tan, moist, Clayey fine SAND (SC) with silt	-2 lililii			HA	:			
	0.8	<u></u>	Gray-Ta	n, moist to wet, Silty fine SAND (SM) with clay Wet from 2.5 feet			5 2.5					
		3									.	
			Tan-Gray, wet,	poorly graded fine to medium SAND (SP-SM) with	-3.5 th silt			HA				
	1.2	4		to Silty fine SAND (SM)						:		
							:					
	1.6	5										
				·				3		ļ		
÷		6 (Boring terminated at 6 ft.		E 		į			 	
	2	7									ļ., .	
] - -									

Notes:

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

*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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM.

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Jones

LOGGED BY: DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

12-29-09 DATE: 5.5'

SURFACE ELEVATION:

PROJECT NO.:

EC09-249G

P. Lankford, EIT

	HA	\-6	DEPTH TO WATER - INITIAL	*: ♀ 2.5' AFTE	R 24 I	1UOI	₹S:	¥ _	c	AVI	NG:	<u>C</u> 5.5'
(MSL) (ft) Depth (meters)			Description						Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Lim Moisture Content - ● N-Value - 7///////
0	0		8 inches of TOPSOIL		/							10 20 30 40 50 60 70
0.4	_ 1	Brown-Gray	, moist to wet, poorly graded fine to r SM) with silt to Silty fine SAND (0. medium SAND (SP SM)	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7			НА				
	2											
0.8	Ţ	<u>7</u> =	Wet from 2.5 feet									
	3		Tan-Gray from 3 feet									
1.2	4											
	5						<u>.</u>					
1.6			Boring terminated at 5.5 ft.	,v-								
2	6											
	7											
											!	

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.



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

PROJECT NO.: SURFACE ELEVATION:

EC09-249G INA

BORING LOCATION: Ananias Dare DRILLER: GET Solutions, Inc.

LOGGED BY:

P. Lankford, EIT

В	OF	RIN	G LOG	DRILLING METHOD:		<u></u>					ATE		12-28-09
		HA	۱-7	DEPTH TO WATER - II		TER 24 H	HOUF	RS: ₹	¥ _			_	> C. 4'
દ ∉	- w			,I		- 1				<u> </u>	ē	8	TEST RESULTS
Elevation (MSL) (ft)	Depth meters	Depth (feet)		Description	I	Graphic	Sample No.	Sample Recovery	ampl	Blows per 6"	N-Value	% < #200	Plastic Limit ⊢ Liquid Limit Moisture Content - ●
ĬŠ	ي ت		-			Ō	Ö	ις _δ	S)	ш и	Ż	%	N-Value -
	0	0		6 inches of TOPS	2011		ļ						10 20 30 40 50 60 70
				o inches of TOP3	OL	7777							
),			НА				
	_	+	Tan, moist, S	Silty fine SAND (SM) with t roots	race clay and trace small				ПА				
		1		10013									
	0.4	<u>├</u>											
]	<u></u>	F	Reddish Tan, wet, Silty fine	∍ SAND (SM)	1.5			HA				
				•					'				
		2	Reddish Tar	n, wet, poorly graded fine t	to medium SAND (SP) to	2 11 11			НА				
			poorly g	graded fine to medium SAN	ND (SP-SM) with silt	1966 6 6 6 9136 6 1							
	0,8]			Antika Antika Kasal							
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	1.2	4 (1970 C. 4970 C.							
				Boring terminated a	ıt 4 ft.					•			
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Notes:

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

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

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



BORING LOG HA-8

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: West

DRILLER: GET 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

12-29-09 DATE: CAVING> _C

6.5

Description Park P			ПР	DEPTH TO WATER - INITIAL": # 3.5 AFT	CR 24		NO.	- -	`	AVII		
0 0 24 inches of TOPSOIL. 1	ਙ€	ري ري	آ ے			<u>e</u>	<u>a</u> 2	اء يواز	·υ =	<u>ā</u>	8	
0 0 24 inches of TOPSOIL. 1	賣工	ئِةٍ ئِةٍ قِدْ يَةٍ	真희	Description	<u>Ā</u>			등 를	ار ات 16	/alt	#5	
0 0 24 inches of TOPSOIL. 1	§ ē	[2 원	ద৺	Description	E]äa	و قا] 평	m g]	۷	
24 inches of TOPSOIL 1	ш 🧲			· · · · · · · · · · · · · · · · · · ·	<u> </u>	Ľ	V. 0	-			6	N-Value -
Dark Gray, moist to wet, Clayery fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics Boring terminated at 6.5 ft.		c	0		_l							10 20 30 40 50 60 70
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.				24 inches of TOPSOIL	7,7,7	1						
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.		ļ	\vdash		1111	1						
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.		1			4444	1	1	l .				.
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.					1777	1	1					
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.			H		1,7,7,7	1	1					
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.					1777	1	1		· ·			-
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.			1		1477	ŀ	1					L
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.					1272	1	1					
Dark Gray, moist to wet, Clayey fine SAND (SC) with silt, with organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics HA Boring terminated at 6.5 ft.		n⊿		•	1222	1		1	l			
Dark Gray, moist to wet, Clayey line SAND (SC) with sit, with organics Wet from 3.5 feet Dark Brown, wet, Sitty fine SAND (SM) with organics Boring terminated at 6.5 ft.			Ш		1777	1						
Dark Gray, moist to wet, Clayey line SAND (SC) with sit, with organics Wet from 3.5 feet Dark Brown, wet, Sitty fine SAND (SM) with organics Boring terminated at 6.5 ft.					1222	1	1		l	Į.		
Dark Gray, moist to wet, Clayey line SAND (SC) with sit, with organics Wet from 3.5 feet Dark Brown, wet, Sitty fine SAND (SM) with organics Boring terminated at 6.5 ft.					1333	1				ĺ		
Dark Gray, moist to wet, Clayey line SAND (SC) with sit, with organics Wet from 3.5 feet Dark Brown, wet, Sitty fine SAND (SM) with organics Boring terminated at 6.5 ft.			<u> </u>		1277	1					ľ	 - <u>:</u> <u>:</u> <u>:</u> <u>:</u>
Dark Gray, moist to wet, Clayey line SAND (SC) with sit, with organics Wet from 3.5 feet Dark Brown, wet, Sitty fine SAND (SM) with organics Boring terminated at 6.5 ft.		<u> </u>	2	·	2444	t		1			l	L. iiiiiiii
Organics Wet from 3.5 feet Dark Brown, wet, Silty fine SAND (SM) with organics Boring terminated at 6.5 ft.		1		Dark Gray moist to wet. Clavey fine SAND (SC) with silt, with		2	1	HA			l	1 : : : : : : : :
Wet from 3.5 feet 12 4 Dark Brown, wet, Silty fine SAND (SM) with organics 5 18 Boring terminated at 6.5 ft.				organics	177	뒨	1	1			l	
Wet from 3.5 feet 12 4 Dark Brown, wet, Slity fine SAND (SM) with organics 9 Boring terminated at 6.5 ft.				•	2/2/2/	Z		1	ļ			
Wet from 3.5 feet 12 4 Dark Brown, wet, Slity fine SAND (SM) with organics 9 Boring terminated at 6.5 ft.		۱,,			2/2/2	ž	ľ	1				
Wet from 3.5 feet 1.2 4 Dark Brown, wet, Silty fine SAND (SM) with organics 5 18 Boring terminated at 6.5 ft. 7		U.8	╁		2//	2]					1	
Wet from 3.5 feet 1.2 4 Dark Brown, wet, Silty fine SAND (SM) with organics 5 18 Boring terminated at 6.5 ft. 7			<u> </u>		277			l				 : :::::::
Dark Brown, wet, Silty fine SAND (SM) with organics			3		2/2/	Z				1		L
Dark Brown, wet, Silty fine SAND (SM) with organics					77	Ž						
Dark Brown, wet, Silty fine SAND (SM) with organics					Z Z Z	ź						
Dark Brown, wet, Silty fine SAND (SM) with organics					7/	Z]	1		İ			Lii;;;;;
Dark Brown, wet, Silty fine SAND (SM) with organics			Ž	Wet from 3.5 feet	22/	2		ļ				
Dark Brown, wet, Silty fine SAND (SM) with organics Compared to the compare		1			2/2/	Ž			1	1		
Dark Brown, wet, Silty fine SAND (SM) with organics Compared to the compare			<u> </u>	•	2/2/2	<u> </u>						<u> </u>
Dark Brown, wet, Sitty fine SAND (SM) with organics		1,2	4_		477	뒭		1				L.:
5		Į.		Dark Brown, wet, Silty fine SAND (SM) with organics		Ē		HA	l .			
1.6 6 Boring terminated at 6.5 ft.				24 2,,,,,				ļ		l	ł	
1.6 6 Boring terminated at 6.5 ft.									1			
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1.6 6 Boring terminated at 6.5 ft.						티	1			ľ		
1.6 6 Boring terminated at 6.5 ft.			-							l		
6 Boring terminated at 6.5 ft.			5								ļ	L
6 Boring terminated at 6.5 ft.					100				1	1		
Boring terminated at 6.5 ft.		1.6	\vdash		553	Ħ						
Boring terminated at 6.5 ft.		1	-	·		욉		1			l	<u> </u>
Boring terminated at 6.5 ft.		1						1			1	La indication in the interior
Boring terminated at 6.5 ft.					E 113		1			ľ	1	1 : : : : : : : : : : : : : : : : : : :
Boring terminated at 6.5 ft.		L									1	
7 - Soring terminated at 6.5 it.			6					1	1	1		<u> Felerierierierierie</u>
7 - Soring terminated at 6.5 it.						Ĕ					1	Limitalianianianianianianianianianianianianiani
7 - Soring terminated at 6.5 it.		1			丰田				1			
7 - Soring terminated at 6.5 it.		1 _		·		E	1				1	
7		2	-∐	Boring terminated at 6.5 ft.		1					1	<u> </u>
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Notes		1		·		1		L'	<u>L</u> .	\perp	L	
	<u> </u>	4	***									SS = Split Spoon Sample

Notes:

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

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.



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Amelia

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.: **SURFACE ELEVATION:**

EC09-249G

LOGGED BY: P. Lankford, EIT

DATE:

12-29-09

		H/	1-9 DEPTH TO WATER - INITIAL*: \(\forall \) AF	TER 24 I	IOUF	RS: -	<u> </u>	c	AVI	NG:	<u>C</u> 5.5'
Elevation (MSL) (ft)	Depth (meters)			Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
	0	0	Gray-Tan, moist, Silty fine SAND (SM) mixed with root mat	**************************************		. !	HA				10 20 30 40 50 60 70
	0.4	1	Gray-Tan, moist to wet, Silty fine SAND (SM)	1.5			НА				
	0.8	3 \									
1	1.2	4	Tan-Gray, wet, poorly graded fine to medium SAND (SP-SM) wit to Silty fine SAND (SM)	4 h silt			HA				
	1.6		Boring terminated at 5.5 ft.								
	2	6									
	i	7				3					

Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

INA

BORING LOCATION: Tanali DRILLER: GET Solutions, Inc.

LOGGED BY:

P. Lankford, EIT

			G LOG	DRILLING METHOD: Hand Auger						DA			12-29-09
		HA	-10	DEPTH TO WATER - INITIAL*: ¥ 4' AF			IOUI	₹S:	¥	CA	VII	NG>	<u>C</u> <u>5'</u>
<u>ē</u> €	رة ا	ے ح		,		٦̈́	e e	وَ بِدِ	e "	S =2	eg.	200	TEST RESULTS
(MSL) (ft)	Depth meters	Depth (feet)		Description		Graphic	amb So.	<u>ğ</u> m	Sample Type	Blows per 6"	N-Value	< #200	Plastic Limit ⊢ Liquid Lim Moisture Content - ●
<u> </u>	<u>u)</u>					9	Š.	Ω S	S.	" "	Ż	%	N-Value -
	0	0				, , , , ,							10 20 30 40 50 60 70
		ļ	·	18 inches of Sandy TOPSOIL		1177							<u> </u>
													
						1444							.
		<u> </u>	<u> </u>			7 4 4 4 4							
		1_				/ / / / /							<u> </u>
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	0.4				•	/ / / / /				.			ļ
			Tan moist to w	vet, poorly graded fine to medium SAND (SI	────1.5 ² P-SM) with				HA				
				silt to Silty fine SAND (SM)					1				
		2											
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	0.8												<u>.</u>
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		3											 - !!!!!!-
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	1.2	4 5	<u> -</u>	Wet from 4 feet									
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		5 (Boring terminated at 5 ft.			1					ĺ	::
	1.6	┢	1			l	1						
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		7	1					1					
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		-	1	•									
_	l tes:					1							SS = Split Spoon Sample

Notes:

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

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.



BORING LOG HA_11

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: East Woodlands (Offset 90' to the East)

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: LOGGED BY:

P. Lankford, EIT

DATE:

12-29-09

CAVING> C

		HΑ	-11 DEPTH TO WATER - INITIAL*: \(\noting\) 2.5' AFTE	R 24	HOU	RS:	-	c	AVI	NG:	• <u>C</u> 3'
(#)				Graphic		1	1	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Lim
(MSL) (ft)	Dej (met	Depth (feet)	Description	Gra	San	San	Sample	Be Be	> <u>'</u>	%	Moisture Content - ● N-Value - ////////
Ţ	0	D	Gray-Tan, moist, Silty fine SAND (SM) with clay; (Possible FILL)	 	Я		НА				10 20 30 40 50 60 70
			Gray-Tan, moist, Sitty line SAND (Siv) with day, (Fossible FILL)	\bowtie	<u> </u>						
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		1		\bowtie	K						
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l	0.4			_₩				ļ			
١			Gray-Tan, moist to wet, poorly graded fine to medium SAND (SP-				HA				
İ		_	SM) with silt to Silty fine SAND (SM), with Marine Shell Fragments								
İ		2							1		
ı											
	0.8	2	Wet from 2.5 feet								
		3 (
I		-									
			Boring terminated at 3.5 ft.		Щ				ŀ		
			Borning terminated at 0.0 ft.					ĺ	'		
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Cannon Gate

PROJECT NO.: **SURFACE ELEVATION:**

EC09-249G INA

LOGGED BY:

P. Lankford, EIT

DATE:

12-29-09

		HA	-12	DEPTH TO WATER - INITIAL*: \(\frac{\pi}{2}\) \(\frac{3}{2}\)	5' AFTER	₹ 24	HOUF	RS:	* _	c	ΑVI	NG:	· C6'
Elevation (MSL) (ft)	_	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 - □
	0	0				, , , , ,							10 20 30 40 50 60 70
				12 inches of TOPSOIL		/ / / / /							
	İ				ŀ	/	1						
				·		/ / / / /						ĺ	
						,,,,,,	1						
		1			1	novo.			HA				
		<u> </u>	Gray, mois	st to wet, poorly graded fine to medium SAND y graded fine to medium SAND (SP-SM) with a	(SP) to	ก็เขาสู้ สารสาร			''^				
	0.4	<u> </u>	boout	y graded line to medium SAND (SF-SW) with t	SIIL	nie i i i				E			
						11 11 11 11 11 11 11 11 11 11 11 11 11							
	<u> </u>	2	1										L
				•		1946 (1949) 1946 (1947)	1						
		<u> </u>		•		in ell Johnson	1		1	[<u> </u>
	0.8			Tan from 2.5 feet		130 C T 1 134 C 1							<u></u>
						anart. Digiti.							
		3				9.31. F. C.					ļ	1	
						13: 11:							
		1		•		131 C C							
		<u></u>	¥-	Wet from 3.5 feet		13.11							
						iji ij				•			L
	1.2	4			4				НА				
•			Ta	an-Gray, wet, Clayey fine SAND (SC) with silt			1		'"				
	<u> </u>		4		•						1	1	-
			<u>.</u>										<u></u>
		5			5				HA				
	1.6		Tan-Gray, w	et, poorly graded fine to medium SAND (SP-S to Silty fine SAND (SM)	M) with silt								
			-	to only mile or and item,							1		
		-	<u> </u>					l	1				
		-								İ	ı	İ	
		6 (Ţ	Boring terminated at 6 ft.			4						-
			<u> </u>	borning terminated at o it.						1	1		
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	2	\vdash	-							1.			
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		7	4					1					-
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		-	-										+
	<u></u>		<u>.</u>	<u> </u>		<u> </u>	<u> </u>						SS = Split Spoon Sample

Notes:

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

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.



PROJECT: Roanoke Island Water System	em Improvements
--------------------------------------	-----------------

CLIENT: CDM

PROJECT LOCATION: Roanoke Island, North Carolina

BORING LOCATION: Gravel Road After Bartow

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

DATE:

LOGGED BY: P. Lankford, EIT 12-28-09

		НА	-13 DEPTH TO WATER - INITIAL*: ₩ 1.5' AFTE	R 24 I	HOU	RS:	*		AVII		<u>c</u> 4'
Elevation	Depth	Depth (feet)		Graphic	Sample	Sample	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - ///////
	0	0	6 inches of TOPSOIL	, , , , , , , , , , , , , , , , , , ,							10 20 30 40 50 60 70
		-	Gray, moist, poorly graded fine to medium SAND (SP); (Possible FILL)				HA		٠		
	0.4		Dark Gray-Brown, moist to wet, Silty fine SAND (SM) with organics	KIKIKIKIKI KIKIKIKIKI			HA	:			
		2	₩et from 1.5 feet								
			Do l. O (1 0.5 fort	11114141414 11144141414 114441414			:				
	0.8	3	Dark Gray from 2.5 feet	131111111111 10111111111111111111111111		i i					
				12121212121 1010101111111 1712121212							
	1.2	4 (Boring terminated at 4 ft.	CHARRES CHILLIAN CHARRES			:		:		
	1.6	5									
		6					·				
	2										
	_	7		;	ļ						

Notes:

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

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.



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

BORING LOCATION: First at Harriot DRILLER: GET Solutions, Inc.

LOGGED BY: P. Lankford, EIT

DRILLING METHOD: Hand Auger

DATE:

3-8-10

		1/\	-14	DEPTH TO WATER - INITIAL*: \(\forall \) 3.5' A	FTER 24 I	,001	·O·	- -	 -		NG:	
(MSL) (#)	Depth (meters)	Depth (feet)		Description	Graphic	Sample No.	Sample	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Llı Moisture Content - ● N-Value -
	0	0		10 inches of TOPSOIL	//// ////			1				10 20 30 40 50 60 7
				moist, poorly graded fine to medium SAND (SP-SM silt, with trace organics	1.5			HA				-
	0.8	2	Tan-Gray	, moist to wet, poorly graded fine to medium SAND (SM) with silt to Silty fine SAND (SM) Light Gray from 2 feet	SP-							
		4_	<u>7</u> -	Brown from 3.5 feet Wet from 3.5 feet		:						
	1.6						:					
		6		Boring terminated at 6.5 ft.								
												-
	2.4	8						-			i i	
	3.2	10										
	4	12										
		14								:		ļ
			† - -									

Notes:

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



PROJECT:	Roanoke Islan	id Water Systen	n Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: First at Amanda

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.: _

EC09-249G SURFACE ELEVATION: INA

LOGGED BY: P. Lankford, EIT

DATE:

3-8-10

		HA	-15	DEPTH TO WATER - INITIAL*: ¥ 2'	AFTER 24	ноі	JRS:	* _	c	AVI	NG>	<u>C</u> 6'
(MSL.) (ft)	Depth (meters)	Depth (feet)		Description	Graphic	Sample	Sample Personery	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit
-	0	0		40 :		4						10 20 30 40 50 60 70
				18 inches of TOPSOIL	· · · · · · · · · · · · · · · · · · ·	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		i				
	8,0	2 \	Gray, moist	to wet, Silty fine SAND (SM) with clay and with organics Wet from 2 feet	1.5 trace			НА				
		4	Bla	ack, wet, Silty fine SAND (SM) with organics	3.5		:	НА				
	1.6		Brown, wet, p	oorly graded fine to medium SAND (SP-SM) wi Silty fine SAND (SM), with trace organics	4.5 th silt to	T. T.		HA	:			
			,									
ı		6 (Boring terminated at 6 ft.								
-						E						
	2.4	8										†
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		10										k
	3.2							į				
		12	<u>.</u>	•								
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Barlow at US-64

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA

LOGGED BY: P. Lankford, EIT

DATE:

3-8-10

		HA	-16 DEPTH TO WATER - INITIAL*: \(\frac{4}{} \) AFT	ER 24	HOU	RS:	¥ _	c	AVI	NG:	<u> </u>
Elevation (MSL) (ft)	_	Depth (feet)	Description	Graphic	Sample	Sample Possion	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - □
	0	0	18 inches of TOPSOIL	/	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					S I	10 20 30 40 50 60 70
		,	Tan, moist, Silty fine SAND (SM) with clay	5		١.	HA				
			Tan, moist, Clayey fine SAND (SC) with silt	2 ///			HA				
	0.8		Tan, moist, Silty fine SAND (SM)	.5			HA				
		<u>4 </u>	Tan, wet, poorly graded fine to medium SAND (SP) to poorly grade fine to medium SAND (SP-SM) with silt	4		·	НА				
	1.6			130 ft 1 1130 ft 1 1130 ft 1 1130 ft 1		:					
		6		14.00 t t 4.00 t t 14.00 t t 2.00 t t 14.00 t t							
:	2.4		Boring terminated at 7 ft.	10 16 L C						•	
						1					
	3.2	10									
							:				
		12									
	4	14		i E						į	

Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Barlowe at Wingina

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA

LOGGED BY:

P. Lankford, EIT

DATE:

3-8-10

		HA	-17	DEPTH TO WATER - INITIAL*: ¥	4' AF1	FER 24	HOUF	RS:	<u> </u>	_ CA	VINC	G> <u>C</u>
Elevation (MSL) (ft)				Description		Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	IN-Value - /////////
	0	0		6 inches of TOPSOIL		7,7,7						10 20 30 40 50 60 70
			Tan, moist to v	wet, poorly graded fine to medium SAND silt to Silty fine SAND (SM)	(SP-SM) w	ith		:	HA		:	
		2										
	0.8											
		4 5	 	Wet from 4 feet				:				
	1.6	6										
				Boring terminated at 7 ft.	-				:			
	2.4	8						į		:		
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Notes:

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PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Scuppenmong at Arbor

DRILLER: GET Solutions, inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: ₩ 1.5' AFTER 24 HOURS: ₩

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

3-8-10

DATE:

CAVING> C

		ПА	-18 DEPTH TO WATER - INITIAL*: \(\varphi\) 1.5' AFT	ER 24 I	поо	KO.	= -		AVI	10.	
€	- îŝ	_		<u>.</u> 2	e	e ≥	<u>o</u> .	w =	φ	8	TEST RESULTS
(MSL) (ft)	Depth meters	Depth (feet)	Description	Graphic	Sample	Sample Recovery	sample Type	Blows per 6"	N-Value	% < #200	Plastic Limit H Liquid Lim
NS.	2 2	吕윤	Description	1 8	Sal	Sar ec	Sar	面	1	٧,	Moisture Content -
€		1		<u> </u>	<u> </u>	0, [5				6	N-Value -
	0	0									10 20 30 40 50 60 70
			12 inches of TOPSOIL	1,444	1						
İ		<u> </u>		1444	3						
		<u> </u>		7777	1	İ					
			Black, moist to wet, Silty fine SAND (SM) with clay and with organ		1		HA				[i., ii., ii., ii.
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1		<u> </u>	Wet from 1.5 feet			١.					
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				5 医基金	į	l	НА		1		F : : : : : : :
	1.6	╁	Dark Brown, poorly graded fine to medium SAND (SP-SM) with sil	tole and	=		'"`				
		<u> </u>	Dark Brown, poorly graded fine to medium SAND (SP-SM) with sill Silty fine SAND (SM) with organics	1				ŀ	l	l	
1		6				1					Lainininini
		<u> </u>	Boring terminated at 6 ft.				ļ.	1			1 : : : : : : :
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Scuppenmong at Dogwood

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

INA

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

3-8-10 DATE:

		AH	-19	DEPTH TO WATER - INITIAL*: ¥	4 AFTE	R 24 H	HOUR	ks: 3	<u>*</u> _	C	AVII	√G>	<u>C</u>
Elevation (MSL) (ft)		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 - M-Value -
		0		10 inches of TOPSOIL	0.8	/			HA				10 20 30 40 50 60 70
		2		Gray-Tan, moist, Silty fine SAND (SM) Tan from 1.5 feet									
	0.8			lish Tan, moist, Clayey fine SAND (SC) with					HA				
		<u>4 5</u>		moist to wet, poorly graded fine to medium SM) with silt to Silty fine SAND (SM) Wet from 4 feet	SAND (SP				HA				
	1.6			Gray from 5 feet							:		
		6		Boring terminated at 6 ft.									
	2.4	8	·							:			
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Notes:

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PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Gardens

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

DATE:

LOGGED BY: P. Lankford, EIT 3-8-10

		HA	-20	DEPTH TO WATER - INITIAL*: ¥ 3.5'	AFTE	R 24 F	IOUF	RS:	¥ _	c	AVII	NG>	<u>C</u> 6.5'
Elevation (MSL) (ft)		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 - ///////////////////////////////////
	0	0		8 inches of TOPSOIL	0.7				HA.				10 20 30 40 50 60 70
		2	Gray, moist, po	oorly graded fine to medium SAND (SP-SM) w Silty fine SAND (SM)	itn siit to				:				
	8.0		Light Gr	ray-Tan, moist, Clayey fine SAND (SC) with si					HA				
		4	Light Grav we	Light Gray, wet, Silty fine SAND (SM) et, poorly graded fine to medium SAND (SP) to	3.5 4				HA HA				
	. 1.6		grad	ded fine to medium SAND (SP-SM) with silt		iieeli iviii. iviii. iieli iviiv							
		6				916 () : 11							
				Boring terminated at 6.5 ft.		11011			<u> </u>			:	
	2.4	8	-										
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Meekins

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

DATE:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

3-8-10

CAVING> C

		HΑ	-21	DEPTH TO WATER - INITIAL	<u>*: ♀ 3'</u> AFTE	R 24 I	HOUF	₹S: -	¥ _	c	AVI	NG>	<u> </u>
Elevation (MSL) (ft)		Depth (feet)		Description				Sample Recovery		Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit → Liquid Limit Moisture Content - ● N-Value - [[[[]]]]
	0	0_		6 inches of TOPSOIL		,,,,,					ı	i	10 20 30 40 50 60 70
			Tan-Gray, mo	ist, poorly graded fine to medium ded fine to medium SAND (SP-SI	—————0.5 SAND (SP) to poorly VI) with silt	(1 % 6 f 1 (7 % 6 f 1 (4 % 6 f 2) (1 % 6 f 1)			HA HA				
			I\	oorly graded fine to medium SAN Silty fine SAND (SM)								:	
		2	Light Gray-T	an, moist to wet, Silty fine SAND	(SM) with trace clay				НА	:			
	0.8	- <u>-</u>	<u>Z</u>	Wet from 3 feet				:					
	į	4	Tan, wet, poo	rly graded fine to medium SAND (fine to medium SAND (SP-SM) v	(SP) to poorly graded with silt				HA	:			
	1.6												
		6 (Boring terminated at 6 ft.		3.77							
	_24	8											
	3.2	10											
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Raleigh Wood

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: ₩ 2.5' AFTER 24 HOURS: ¥

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: LOGGED BY: P. Lankford, EIT

3-4-10

DATE: CAVING> C

		ПА	-ZZ DEPTH TO WATER - INITIAL*: \(\frac{1}{2}\) 2.5' AF	TEI	R 24 h	HOUF	RS:	*	c	Α۷Ι	NG:	> <u>C</u> 5'
5 €	ر ه	-			<u>.ပ</u>	<u>o</u>	o ≥	<u>o</u> _	ω =	र्व	8	TEST RESULTS
Efevation (MSL) (ft)	Depth meters	Depth (feet)	Description		Graphic	Sample No.	lg s	Sample Type	Blows per 6"	N-Value	% < #200	Plastic Limit ⊢ Liquid Limit
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	0	0	6 inches of TOPSOIL		/ / / / /							10 20 30 40 30 00 70
				0.5	/ / / / / / - - - - -		İ	НА				
		<u> </u>	Tan, moist, Silty fine SAND (SM)					🖺	· ·			
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				-1.5				HA				
		2	Tan, moist, Clayey fine SAND (SC) with silt	2						1		
			Tan, moist to wet, Silty fine SAND (SM)					HA				
	0.8	Ţ	Wet from 2.5 feet							,		
				<u>3</u>				١				
			Tan, wet, poorly graded fine to medium SAND (SP) to poorly gra	ded	14 (4)			НА				
			fine to medium SAND (SP-SM) with silt	,								
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PROJECT:	Roanoke Island Water System I	Improvem <u>ents</u>

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Fields

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: \(\noting\) AFTER 24 HOURS: \(\noting\)

DATE: _ 3-4-10

LOGGED BY: P. Lankford, EIT

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

CAVING> C

Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample No.	Sample	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit
	0_	0	6 inches of TOPSOIL	***							10 20 30 40 50 60 70
			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				НА				
		4	graded fine to medium SAND (SP-SM) with silt	3 16 6 7 1 7 3 1 1 1 1 1 3 10 7 6 3 1 1 3 7 6 3 1							
	1.6	<u></u>	Wet from 5 feet	anicer 19:44 (19:40 (19) 19:44 (19)							
		6									
				140 64.1 100 6 6 100 6 1 100 6 1							
	2.4	8	Boring terminated at 8 ft.								
			Boring terminated at 6 ft.					:			
						:					
	3.2	10									
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Steve Basnight

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

INA

LOGGED BY: DRILLER: GET Solutions, Inc.

DATE:

P. Lankford, EIT 3-4-10

DRILLING METHOD: Hand Auger

		HA	-24	DEPTH TO WATER - INITIAL*: 😝	_ AFTE	R 24 I	HOUI	RS:	¥ _	c	AVII	NG:	<u> </u>
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Elevation (MSL) (ft)	Depth meters	Depth (feet)		Description		Graphic	Š Š	Sample Recovery	mpl ype	Blows per 6"	N-Value	% < #200	Plastic Limit ⊢ Liquid Limit Moisture Content - ●
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]		Tan from 1.5 feet]		ŀ	
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				Tan, moist, Silty fine SAND (SM)	`	1			НА				
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			16	an, moist, poorly graded fine to medium SAND (S	r)								- : : : : : : : : : : : : : : : : : : :
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Notes:

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



PROJECT:	Roanoke	Island	Water	System	Improvements
				-,	.,,,,

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Candela

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: ¥

AFTER 24 HOURS: 👺

EC09-249G PROJECT NO.: SURFACE ELEVATION: INA

P. Lankford, EIT LOGGED BY:

DATE: 3-3-10

CAVING> C

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	Depth (meters)	Depth (feet)		Graphic	Sample	불	Sample Type	Blows per 6"	N-Value	< #200	Plastic Limit ⊢ Liquid Limit
엉덩	je je	Depth (feet)	Description	<u> </u>	läž		달림	3을 5로		Ÿ	Moisture Content -
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Notes:

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

*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



PROJECT: Roanoke Island Water Syst	tem Improvements
------------------------------------	------------------

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Holy Ridge

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

INA

LOGGED BY: P. Lankford, EIT

3-3-10 DATE:

CAVING> C

		ПΑ	-26	DEPTH TO WATER - INI	TIAL*: \(\frac{\operatorname{A}}{\operatorname{A}}\) AF	FTER 24 H	IOUF	₹5: -	¥ _	с	AVII	NG:	<u> </u>
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Notes:

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



PROJECT:	Roanoke Island	Water Sy	stem Im	provements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: US-64 at Pearce

P. Lankford, EIT DRILLER: GET Solutions, Inc. LOGGED BY: DRILLING METHOD: Hand Auger 3-3-10 DATE:

PROJECT NO.:

SURFACE ELEVATION:

EC09-249G

INA

DEPTH TO WATER - INITIAL*: ♀ CAVING> C AFTER 24 HOURS: ₹

		ПА	-21 DEPTH TO WATER - INITIAL*: ♀ AFTE	R 24 I	HOU	RS:	¥ _	c	AVI	NG:	> <u>C</u>
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Pearce at Fort Hugar

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: ¥ 4.5 AFTER 24 HOURS: ¥

DATE:

3-3-10

EC09-249G

P. Lankford, EIT

CAVING> _C

LOGGED BY:

PROJECT NO.:

SURFACE ELEVATION:

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Elevation (MSL) (ft)	£ ê	₽₽		Graphic	Sample No.	Sample Recovery	a a	ر 9 "S	N-Value	#200	Plastic Limit H Liquid Limit
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Notes:

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



PROJECT:	Roanoke	Island Wate	r System	Improvement

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Fort Raleigh at National Park

DRILLER: GET Solutions, Inc. **DRILLING METHOD:** Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: LOGGED BY: _ P. Lankford, EIT

3-3<u>-10</u> DATE:

CAVING> C

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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Brakewood at N Fearing

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: 😾

AFTER 24 HOURS: ₹

DATE:

PROJECT NO.:

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT 3-3-10

EC09-249G

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CAVING> C

		ПΑ	-30 DEPTH TO WATER - INITIAL*: \(\foatie\) after	R 24 I	HOU	₹5:	* -	·	AVII	NG:	> <u>C</u>
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Airport at Warren

SURFACE ELEVATION:

EC09-249G

DRILLER: GET Solutions, Inc.

LOGGED BY: P. Lankford, EIT

PROJECT NO .: _

3-3-10

DRILLING METHOD: Hand Auger

DATE:

CAVING> C. DEPTH TO WATER - INITIAL*: ♀ 3.5' AFTER 24 HOURS: ▼

			-31 DEPTH TO WATER - INITIAL*: $\frac{1}{2}$ AFTE	K 24 I	T	iks.	- -				TEOT BEQUITE
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Airport at Daphne

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: _

LOGGED BY: P. Lankford, EIT

DATE: ____

3-4-10

		HΑ	-32	DEP1	тн то у	VATER -	INITIAL	*: ♀ <u>1.</u>	5' AFTE	ER 24 H	HOUF	₹S: -	<u>¥</u>	°	AVI	NG:	<u> </u>	_
(MSL) (ft)	Depth (meters)	Depth (feet)			De	escriptio	n			Graphic	Sample No.	Sample Recovery	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Moisture Content - ● N-Value -	
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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



Depth (feet)

Elevation (MSL) (ft) Depth (meters)

8.0

1.6

2.4

3.2

8

10

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

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Airport at Old Country

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

Description

12 inches of TOPSOIL

Gray, moist to wet, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt Tan from 1.5 feet

Wet from 6 feet

Boring terminated at 8 ft.

DEPTH TO WATER - INITIAL*: ₩

AFTER 24 HOURS: ₹

Graphic

Sample

No.

Sample Recovery

Sample

HA

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY:

P. Lankford, EIT 3-4-10

CAVING> C

DATE:

N-Value

Blows per 6"

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



PROJECT:	Roanoke	Island Water	System	Improvements
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CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: D Victor Meekins at Sunnyside

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT 3-4-10 DATE:

		HΑ	-34	DEPTH TO WATER - INITIAL*: ₩	AFTE	R 24 H	lOUI	RS:	<u>*</u>	_ 0	:AVI	NG:	· <u>C</u>
Elevation (MSL) (ft)		Depth (feet)		Description		Graphic	Sample No.	Sample	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit → Liquid Limit Moisture Content - ◆ N-Value - ///////////////////////////////////
	0	0		8 inches of TOPSOIL	0.7	· · · · · · · · · · · · · · · · · · · ·						•	10 20 30 40 30 60 70
			Tan-Gray,	, moist, poorly graded fine to medium SAND (SP) to graded fine to medium SAND (SP-SM) with silt	poorly	(100 to 1) (100 to 1) (100 to 1) (100 to 1)			HA			ŧ	
		2		Tan from 2 feet		awaa Heid Unita Unita Unita					ļ.		
	8.0		-			omini Takini Takini Takini Tahir		İ					
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		6	-			1236 1736 1736 1436 1436 1436 1436 1436 1436 1436 14							
			- -										
	2.4	8		Boring terminated at 8 ft.		000 6 0 (1976) 1976 6 1986 6	1				į		
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: \(\noting\) 3.5' AFTER 24 HOURS: \(\noting\)

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: LOGGED BY:

DATE:

P. Lankford, EIT 2-24-10

CAVING> C

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Elevation (MSL) (ft)		Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	Plastic Limit ⊢ Liquid Limit
Elevat (MSL)	Deptil meter	∣ଅଞ	Beschphon	E	Sar 4	ec Sal	Sal _	B B	[]	٧	Moisture Content - ●
<u>е</u>					<u> </u>	3, IF				~	N-Value - 7//////
	0	a		L]	1					10 20 30 40 50 60 70
			6 inches of TOPSOIL	1111	1						
	l				1		НА				
			Tan-Gray, moist, poorly graded fine to medium SAND (SP-SM) with				`"`	ļ			
			silt to Silty fine SAND (SM)			İ					
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			Gray-Tan from 1.5 feet				1				
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	0.8		2.5	777	1		HA				
	ĺ		Dark Gray, moist, Clayey fine SAND (SC) with silt, with organics	1//	1		l				
			·	12/2	1						
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			Brown, wet, Silty fine SAND (SM) with organics	EEXE			110				
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL * - - -

DATE:

2-24-10

EC09-249G

INA

CAVING> C 5.5'

LOGGED BY: P. Lankford, EIT

PROJECT NO.: SURFACE ELEVATION:

		HΑ	-36 DEPTH TO WATER - INITIAL*: \(\preceq\) 3' AFTER	R 24 I	HOU	RS:	- _	c	AVI	NG:	<u> </u>
(MSL) (ft)		Depth (feet)	Description	Graphic	Sample No.	Sample	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Lim Moisture Content - ● N-Value - M-Value -
	0	0	8 inches of TOPSOIL	/							10 20 30 40 50 60 70
			Gray-Tan, moist, Silty fine SAND (SM) with clay				HA			į	
		2	Gray, moist, Clayey fine SAND (SC) with silt, with trace organics			į	HA				
	8.0		Black, moist, Silty fine SAND (SM) with clay and organics			ľ	НА				
			Gray-Tan, wet, Silty fine SAND (SM) with clay				HA				
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	1.6						:				-
		6	Boring terminated at 5.5 ft.							į	
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

TEOT DESILITE			HA	-37	DEPTH TO WATER - INITIAL*: ₩ 3	AFTE	R 24 I	HOUR	RS:	¥ _	c	ΑVI	NG>	<u>c</u> <u>7'</u>
18 inches of TOPSOIL Tan-Brown, moist to wet, Silty fine SAND (SM) Gray from 2.5 feet Wet from 3 feet Black, wet, Silty, Clayey PEAT (PT) Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft.	Elevation (MSL) (ft)	ન ક			Description		Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	Plastic Limit
Tan-Brown, moist to wet, Silty fine SAND (SM) Gray from 2.5 feet Wet from 3 feet Black, wet, Silty, Clayey PEAT (PT) Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. Boring terminated at 7 ft.		0	0		18 inches of TOPSOIL									10 20 30 40 30 00 70
Tan-Brown, moist to wet, Silty fine SAND (SM) Gray from 2.5 feet Wet from 3 feet Black, wet, Silty, Clayey PEAT (PT) Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. 24 8 10 12 12 4			· · · · · · · · · · · · · · · · · · ·				, , , , , , , , , , , , , , , , , , ,							
Wet from 3 feet Black, wet, Silty, Clayey PEAT (PT) Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. 24 8 10 10 12			2		Tan-Brown, moist to wet, Silty fine SAND (SM)	——1.5·				HA				
Black, wet, Silty, Clayey PEAT (PT) Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. 24 8 10 12 12		0,8		i	Gray from 2.5 feet									
Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. 10 10 12 12			Ź		Wet from 3 feet	3.5				ا ا				
Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. 24 8 10 32 12 12 12 12 12 12 12 12 12 12 12 12 12			4	1	Black, wet, Silty, Clayey PEAT (PT)									
Black, wet, Silty fine SAND (SM) with organics Tan-Gray with clay from 5 feet Boring terminated at 7 ft. 24 8 10 32 12 12 12 12 12 12 12 12 12 12 12 12 12				 -	·	4 5				l				
Boring terminated at 7 ft. 2.4 8 10 3.2 12 4						4.0				HA				
Boring terminated at 7 ft.		1.6	-	<u> </u>	Tan-Gray with clay from 5 feet	-	X1X1							
Boring terminated at 7 ft.				-			****							
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24 8					Boring terminated at 7 ft.									
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Notes:

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

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



BORING LOG H V ~ 38

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc. DRILLING METHOD: Hand Auger PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

		HA	DEPTH TO WATER - INITIAL*: 3.5' AFTER	R 24 I	HOUR	S: -	<u> </u>	_	AVII	_	<u>3-2-10</u>
Elevation (MSL) (ft)	_	Depth (feet)		Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
	_0	0	24 inches of TOPSOIL		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		·				10 20 30 40 50 60 70
	0.8	2	Dark Gray, moist, Silty fine SAND (SM) with clay and organics	**************************************	, , , , , , , , , , , , , , , , , , , ,		НА				
		4	Gray, moist to wet, Silty fine SAND (SM) with trace clay Wet from 3.5 feet Gray, wet, poorly graded fine to medium SAND (SP) to poorly graded		7		HA HA				
	1.6		fine to medium SAND (SP-SM) with silt						į		
		6	Tan from 6 feet Boring terminated at 7 ft.	er victoria Projekt Orden d Stalekt Ander d Ander d							-
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA

LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

		HΑ	-39 DEPTH TO WATER - INITIAL*: ₩ 3.5' AF	ΓER 2	24 H	OUF	RS:	- _		AVII		> <u>C</u> <u>7'</u>
Elevation (MSL) (ft)		Depth (feet)		\neg					Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - ///////
	0	0	8 inches of TOPSOIL Tan-Brown, moist, Silty fine SAND (SM)	0.7				НА				10 20 30 40 50 60 70
	0.8	2	Black, moist, Silty, Clayey PEAT (PT)	2.5				HA HA				
		<u></u>	Black, moist, Silty fine SAND (SM) with organics Brown, moist to wet, poorly graded fine to medium SAND (SP-SI with silt to Silty fine SAND (SM) Wet from 3.5 feet Tan from 4 feet	3 VI)				НА				
	1.6		rail iloni 4 leec									
		6	Boring terminated at 7 ft.									
	2.4	- 8	Doming terminated at 7 to				į					
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger DEPTH TO WATER - INITIAL * - - -AFTER 24 HOURS: ¥ PROJECT NO.:

EC09-249G INA

SURFACE ELEVATION: LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

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		НΔ	-40	DEPTH TO WATER - INITIAL*:		24 F	HOUR	S:	<u> </u>	— CA	VING	> C 7'
	_			Total March Minae .	<u> </u>		-				_	TEST RESULTS
Elevation (ft)	Depth (meters)	Depth (feet)		Description		Graphic	Sample No	Sample Recovery	Sample Type	Blows per 6"	N-Value % < #200	Plastic Limit H Liquid Limit Moisture Content - N-Value -
	0	_0_		10 inches of TOPSOIL		/ / / / /						10 20 30 40 50 60 70
				Gray, moist, Silty fine SAND (SM)	0.8				на			
		2		Gray-Tan from 2 feet			:					
	0.8			Tan from 2.5 feet			:	:	;			
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				y-Tan, wet, Clayey fine SAND (SC) v	5-				HA		į.	
	1.6	6	Tan, wet, poor	ly graded fine to medium SAND (SP) fine to medium SAND (SP-SM) with) to poorly graded silt	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				:		
						1994 (4) 1131 1 6 (1131 1 6) 1131 1 6 (1131 1 6)						
	2.4			Boring terminated at 7 ft.								<u> </u>
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

		HA	-41	DEPTH TO WATER - INITIAL*: \(\text{\tint{\text{\tint{\tint{\text{\tin\text{\texi}\tint{\text{\text{\texi}\text{\text{\text{\texi{\text{\text{\texi}\text{\text{\text{\text{\text{\texi}\texit{\text{\text{\text{\	AFTE	R 24 H	HOU	RS:	¥ _	C	AVI	NG>	<u> </u>
Elevation (MSL) (ft)	Depth. (meters)	Depth (feet)		Description		Graphic	Sample	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit
	0	. 0		4 inches of TOPSOIL		/ / / / / /							10 20 30 40 50 60 70
			Tan,	moist, Silty fine SAND (SM) with trace clay	0.3				HA				
			Tan-	Gray, moist, Clayey fine SAND (SC) with silt	1.5				HA				
	0.8		Tan, moist to w	et, poorly graded fine to medium SAND (SP) ded fine to medium SAND (SP-SM) with silt	to poorly				HA				
		4 5	7	Wet from 4 feet		6 (6 ()) 14 () () () 14 () () () 14 () () () 14 () () () 14 () () ()							
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Notes:

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

*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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL * - - -AFTER 24 HOURS: ₹ PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

CAVING> C

		ПА	<u>-42</u>	DEPTH TO WATER - INITIA	L*:	R 24 F	IOUR	S:	* -	<u> </u>	AVII	NG>	
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7	pth	Depth (feet)		Description		Graphic	Sample No.	FX	Sample Type	Blows per 6"	N-Value	< #200	Plastic Limit ⊢ Liquid Lin
MS	ع کا	≝⊠		2000		Ö	Sa	Sec	Sa⊓	<u>m</u> <u>x</u>	ź	%	Moisture Content -
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				Tan-Gray, moist, Silty fine SAN					HA				- : : : : : : : : : : : : : : : : : : :
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			Dark Brown	, moist, Silty fine SAND (SM) with	th clay and organics				HA				
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		1	Tan-Gray, mo	ist, poorly graded fine to medium	n SAND (SP-SM) with				'"``				
	0.8		h	silt to Silty fine SAND (SN	(1) 2.5				HA	l			
			G	Gray, moist, Silty fine SAND (SM)							ĺ		
		<u> </u>	·	,	•						ļ		
		<u> </u>			3.5				НА				
		4	Tan-Gray, m	oist to wet, poorly graded fine to	medium SAND (SP-						ŀ		Liiiiiii
				SM) with silt to Silty fine SANE Brown from 4 feet) (SIVI)				l]			
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		- 8	<u> </u>	Boring terminated at 8 ft.	· · · · · · · · · · · · · · · · · · ·	11:11:11:11	1	l		İ			
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: NA

LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

	HA-43		-43	DEPTH TO WATER - INITIAL*: ₩ 3.5' AFT					* _	_ c	AVI	NG:	IG> <u>C</u> 5.5'		
Elevation (MSL) (ft)	_	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 - ///////////////////////////////////		
	0	0		4 inches of TOPSOIL		1 4 4 4 4							10 20 30 40 30 00 70		
			Tan, moist, po	orly graded fine to medium SAND (SP-SM Silty fine SAND (SM)	0.3) with silt to				HA						
			Reddis	sh Tan, moist, Clayey fine SAND (SC) with	ı silt				HA	1					
	0.8	2	R	Reddish Tan, moist, Silty fine SAND (SM)	2 				HA						
		4	Tan, wet, poor	ly graded fine to medium SAND (SP) to po fine to medium SAND (SP-SM) with silt	oorly graded				HA	,					
	1.6					1996) 1000) 1000) 1000) 1000)									
		6		Boring terminated at 5.5 ft.						·					
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Notes:

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



PROJECT:	Roanoke	Island '	Water:	System	Improvement

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Old Wharf at Cudworth

SURFACE ELEVATION: LOGGED BY:

EC09-249G INA P. Lankford, EIT

DRILLER: GET Solutions, Inc.

PROJECT NO.:

-			G LOG	DRILLING METHOD: Hand Auger						E: _	3-2-10	
		HA	-44		3' AFTER 24	HOI	JRS:	<u>¥</u> _	CAV	ING		
Elevation (MSL) (ft)	Depth (meters)	Depth (feet)		Description	Graphic	Sample	Sample Recovery	Sample Type	Blows per 6" N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - ///////	
	0	0		6 inches of TOPSOIL	/ · · · · · · · · · · · · · · · · · · ·	* · · · · · · · · · · · · · · · · · · ·					10 20 30 40 50 60 70	
		. 2	Tan, moist, po	orly graded fine to medium SAND (SP-SM Silty fine SAND (SM) Gray-Tan from 1.5 feet	VI) with silt to			HA				
	0,8		Dark Gray	, moist to wet, Silty fine SAND (SM) with	organics 2			HA				
		-		Wet from 3 feet Black, wet, Silty, Clayey PEAT (PT)	————3.5			НА	:			
		4	_									
	1.6			Boring terminated at 5 ft.					1			
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Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Old Wharf at Schoolhouse

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

DRILLER: GET Solutions, Inc.

LOGGED BY:

P. Lankford, EIT

DRILLING METHOD: Hand Auger

DATE:

3-2-10

		HA-45	DEPTH TO WATER - INITIAL*: ¥ 2.5' AF	TER 24 I	HOUF	RS:	- _	c	AVI	NG>	<u> </u>
<u>გ</u> ⊋				-	Т			(A) =	<u>o</u>	8	TEST RESULTS
(MSL) (ft)	Deptn meters	Depth (feet)	Description	Graphic	를 의	흔	Sample Type	Blows per 6"	N-Value	< #200	Plastic Limit ⊢ Liquid Limit
§ §	ne me	腾쁵	Всоприон	ြည်	Sar	Sar	Sai	표정	ż	> %	Moisture Content - •
"=	_		· .		<u> </u>	** [L				6	N-Value - 77777777
L	0	0	A: L (TODOOU								<u>10 20 30 40 50 60 70</u>
			8 inches of TOPSOIL	1777	1						
				0.7 ს / კ / კ	1		НА				
			Dark Gray, moist, Silty fine SAND (SM) with organics				''^	<u> </u>		ļ.	
-											
1			Black from 1.5 feet			1					
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H	8.0	L	Gray, wet, Clayey fine SAND (SC) with silt				HA				
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			Dark Gray, wet, Silty fine SAND (SM) with organics				HA			· ·	[
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		6	Boring terminated at 6 ft.	15,1-1-7:	1						
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Notes:

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PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Old Wharf at Friendly

DRILLING METHOD: Hand Auger

DRILLER: GET Solutions, Inc.

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

3-2-10 DATE: CAVING> C

	Г	14	-46 DEPTH TO WATER - INITIAL*: \(\noting\) AF1	EK 24 1	HUU	RO:	- -	<u> </u>	~~	NG>	
al .	_	_		l o	d)	_ ≥	63		Ð	g	TEST RESULTS
(MSL) (ft) Depth	띩	동융	Description	Graphic	힐	Sample Recovery	혈혈	Blows per 6"	N-Value	#200	Plastic Limit ⊢ Liquid Lim
친물	텔	الله تع	Description	Sa	ga z	eg gal	ا يق] 🛱 🎖]	٧ %	Moisture Content -
₹	٦			<u> </u>	ļ" <u> </u>	0, 12	ļ.,		ᆮ	8	N-Value -
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	١		8 inches of TOPSOIL	1777	1			1			
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	Ħ		Tan, moist, poorly graded fine to medium SAND (SP-SM) with silt	to		1	HA	l			
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	L		Tan, wet, poorly graded fine to medium SAND (SP) to poorly grad fine to medium SAND (SP-SM)	ed ! ! ! ! !	1	1	1	1			
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Notes:

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PROJECT:	Roanoke	Island	Water	Sy	/stem l	lm	provemer	ıts

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Old Wharf at Beverly

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEDTH TO WATER - INITIAL * - -

3.5' AFTER 24 HOURS: ¥

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA

P. Lankford, EIT LOGGED BY:

3-2-10 DATE:

CAVING> 0

Content Cont			HΑ	47 DEPTH TO WATER - INITIAL*: ₩ 3.5' AFT	ΓER 24	HOU	RS:	¥ _	c	AVIN	IG:	<u> </u>
Moisture Content Moisture Co	<u> </u>					4	_ >	1 45	l	ø	õ	TEST RESULTS
Moisture Content Moisture Co		ers)	ਵਿ	Description	iğ	힐	를 돌	声	§ 6	alue	#50	Plastic Limit ⊢ Liquid Limit
O 10 inches of TOPSOIL Gray-Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with silt Tan-Gray, moist, Clayey fine SAND (SC) with silt Light Gray-Tan, moist, Silty fine SAND (SM) with organics Wet from 3.5 feet 1.6 Description of the provided of the second	할뎅	ag ta	<u>a</u> €	Description	g	Sal Sal	Sar	San	ᄦᄛ]	V	Moisture Content -
Gray-Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SC) with silt Tan-Gray, moist, Clayey fine SAND (SM) with olay Light Gray-Tan, moist, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft.	∃ €	_=	1			, , , , , , , , , , , , , , , , , , ,	υ <u>π</u>	<u> </u>		_	<u>۰</u>	N-Value -
Gray-Tan, moist, poorly graded fine to medium SAND (SP) to poorly graded fine to medium SAND (SP-SM) with slit Tan-Gray, moist, Clayey fine SAND (SC) with slit Light Gray-Tan, moist, Silty fine SAND (SM) with organics Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft.	ļ	0	0		.,,,							10 20 30 40 50 60 70
Gray-Tan, moist, poorly graded tine to medium SAND (SP-SM) with silt Tan-Gray, moist, Clayey fine SAND (SC) with silt Light Gray-Tan, moist, Silty fine SAND (SM) with clay Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft.				10 inches of TOPSOIL	1444	1						
Gray-Tan, moist, poorly graded time to medium SAND (SP-SM) with silt Tan-Gray, moist, Clayey fine SAND (SC) with silt Light Gray-Tan, moist, Silty fine SAND (SM) with clay Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft.	ļ				0 8 4 4 4 4	1		l				
graded fine to medium SAND (SP-SM) with silt Tan-Gray, moist, Clayey fine SAND (SC) with silt Light Gray-Tan, moist, Silty fine SAND (SM) with clay Dark Gray, moist to wet, Silty fine SAND (SM) with organics VVet from 3.5 feet Boring terminated at 6 ft. Boring terminated at 6 ft.	1			Gray-Tan, moist, poorly graded fine to medium SAND (SP) to poor	rly (12.13.		İ	HA	ŀ			<u> </u>
Tan-Gray, moist, Clayey fine SAND (SM) with clay Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft. Boring terminated at 6 ft.	ŀ			graded fine to medium SAND (SP-SM) with silt	a siliti.			l		li		
Light Gray-Tan, moist, Silty fine SAND (SM) with organics Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft.				Tan-Gray, moist, Clayey fine SAND (SC) with silt		}	ļ	"				
Light Gray-Tan, moist, Silty fine SAND (SM) with clay Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft. Boring terminated at 6 ft.			2			1		İ				
Light Gray-Tan, moist, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft. 16 Boring terminated at 6 ft.		0.8	<u> </u>		2.5 (1/1/1/1)	1		l HA				
Dark Gray, moist to wet, Silty fine SAND (SM) with organics Wet from 3.5 feet Boring terminated at 6 ft.	Ī	0.0	Ъ—	Light Gray-Tan, moist, Silty fine SAND (SM) with clay			l		İ	1		<u> </u>
Wet from 3.5 feet 1.6				Dark Gray moist to wet. Silty fine SAND (SM) with organics	3 2 2 2		1	HA	•			
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6 Boring terminated at 6 ft. 2.4 8	- 1		4				1					
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Notes:

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

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345 at Pine Acres

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA

LOGGED BY: P. Lankford, EIT

DATE: 3-2-10

		HA	-48		DEPTH TO WATER - INITIAL*: ¥ 3.5' AFTE					HOU	URS: ¥			AVI	· C	
Elevation (MSL) (ft)		Depth (feet)			Description	n			Graphic	Sample	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit
	0	0		18	inches of TOF	PSOIL			/							10 20 30 40 50 60 70
				Light Gray	, moist, Silty fin	ne SAND (SI	VI)	<u>-</u> 1.5 -				НА			i	
	0.8	2	Dark Gray,		ey fine SAND (_	anics				HA				
		<u> </u>		3.5 feet Aug	wet, Silty fine s ger refusal at 4	feet - Possi			***************************************			HA				
0.00	1.6	6		Во	ring terminated	at 4 ft.								:		
	2.4	8														
	3.2	10														
ļ	4	12														

Notes:

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



PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345 at Tillett

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

H		HA	-49	DEPTH TO WATER - INITIAL*: ¥	TIAL*: ¥ 3.5' AFTER 2				¥ _	c	AVI	/ING> <u>C</u> 6'		
Elevation (MSL) (ft)				Description		Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit	
-	0	0	Tan-Gray, r	8 inches of TOPSOIL moist to wet, poorly graded fine to medium SM) with silt to Silty fine SAND (SM)	0.7 1 SAND (SP-				НА				10 20 30 40 50 60 70	
	0.8	2	- - - -	Gray-Tan from 3 feet										
		4	7 - - - -	Wet from 3.5 feet	- 4.5			į	HA					
-	1.6	6 (i an, wet, poi	orly graded fine to medium SAND (SP) to fine to medium SAND (SP-SM) with silt Boring terminated at 6 ft.	poorly graded									
	2.4	8			·					:				
	3.2	10												
	4	12												
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Notes:

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

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



BORING LOG

PROJECT: Roanoke Island Water System Improvements

CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345 at Jovers

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

PROJECT NO.:

EC09-249G

SURFACE ELEVATION:

LOGGED BY: P. Lankford, EIT

INA

DATE:

3-2-10

	. [HA	-50	DEPTH TO WATER - INITIAL*: ₩	3' AFTER	₹ 24 ⊦	IOUR	S: -	¥ _	c	AVII	NG>	<u>c</u> <u>7'</u>
Elevation (MSL) (ft)		Depth (feet)		Description			Sample No.			Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value -
	0	0		12 inches of TOPSOIL	· .	· · · · · · · · · · · · · · · · · · ·							10 20 30 40 50 60 70
			Tar	n-Gray, moist, Clayey fine SAND (SC) with s	1- silt				HA				
		2	Tan, moist to	o wet, poorly graded fine to medium SAND (S silt to Silty fine SAND (SM) Tan-Gray from 2 feet	1.5 SP-SM) with				HA HA				
	0.8		¥	Wet from 3 feet									
		4	Tan, wet, po	orly graded fine to medium SAND (SP) to po fine to medium SAND (SP-SM) with silt	oorly graded			ĺ	НА				
	1.6					AWEA GARAGE DIRECT			÷				- : : : : : : : : : : : : : : : : : : :
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				Boring terminated at 7 ft.		3:616						ŀ	
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Notes:

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



BORING LOG

PROJECT: Roanoke Island Water System Improvement	PROJECT:	Roanoke	Island Water S	ystem Im	provement	ts
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CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: HWY-345 at C B Daniels Sr

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

INA

DRILLER: GET Solutions, Inc.

LOGGED BY:

P. Lankford, EIT

D			DRILLING METHOD: Hand Auger						ATE		3-2-10
	_	<u>HA</u>	DEPTH TO WATER - INITIAL*: ♀ 3' AF	TER 24	НО	URS:	¥ _	c/	۱۷۱	NG:	<u> </u>
Elevation (MSL) (ft)	Depth (meters)	Depth (feet)	Description	Graphic	Sample	No. Sample	Sample	Blows per 6"	N-Value	% < #200	TEST RESULTS Plastic Limit ⊢ Liquid Limit Moisture Content - ● N-Value - /////////
	0	0		,	/-				1		10 20 30 40 50 60 70
		!	15 inches of TOPSOIL	/ / / / / / / / / / / / / / / / / / /							
		<u> </u>	· · · · · · · · · · · · · · · · · · ·	.25 (,),	, <u> </u>	1	HA				
		-	Tan-Gray, moist, Clayey fine SAND (SC) with silt				'"'				
		2									
	0.8	2	Tan, moist to wet, poorly graded fine to medium SAND (SP) to po graded fine to medium SAND (SP-SM) with silt Wet from 3 feet	2.5 orly			HA	i			
		4		3 96 6 17 30 6 11 97 7	1 1 1 1						
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	1.6	-	_	110 è	i.						
		6		7314 7314		İ					
			Boring terminated at 6 ft.			1		1			
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		14									
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Notes:

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

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.



BORING LOG HA-52

PROJECT:	Roanoke Island	Water System	Improvements
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CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Harbor

DRILLER: GET Solutions, Inc.

DRILLING METHOD: Hand Auger

DEPTH TO WATER - INITIAL*: ₩

AFTER 24 HOURS: ₹

PROJECT NO.: SURFACE ELEVATION:

EC09-249G

INA

LOGGED BY: P. Lankford, EIT

DATE:

3-2-10

CAVING> C

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u (±	ر s)			_i	<u>o</u>	<u>a</u> ≥	" <u>ق</u>	go ÷_	g	% < #200	TEST RESULTS
/ati	žer,	Depth (feet)	Description	Graphic	Ēô	E 🎖	Sample Type	Blows per 6"	N-Value	#	Plastic Limit ⊢ Liquid Limit
MS	عٌ ٽ	≝ ۵ا	, <u>2000, p</u>	&	Sa	Sa	Sa -	<u> </u>	ż	%	Moisture Content -
					┢	-		-	_	Ť	N-Value - 7////// 10 20 30 40 50 60 70
	0 -	0	Oir the set TOROU	+						ŀ	10 20 30 40 30 60 70
			6 inches of TOPSOIL		1	ļ					
			Tan, majet to wet, poorly graded fine to medium SAND (SP) to poor	5 3.51 (M:13 ()			HA		1	l	
			Tan, moist to wet, poorly graded fine to medium SAND (SP) to poo graded fine to medium SAND (SP-SM) with silt		4						
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		L	<u> </u>	_							SS = Split Spoon Sampl

Notes:

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

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.



BORING LOG HA-53

PROJECT:	Roanoke	Island	Water	System	Improvements
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CLIENT: CDM

PROJECT LOCATION: Roanoke Island/ Manteo/ Wanchese, NC

BORING LOCATION: Fort Raleigh

DRILLER: GET Solutions, Inc. **DRILLING METHOD:** Hand Auger

DEPTH TO WATER - INITIAL*: ₩ AFTER 24 HOURS: 🐺 PROJECT NO.:

EC09-249G

SURFACE ELEVATION: INA P. Lankford, EIT LOGGED BY:

DATE:

3-3-10

CAVING> C	8'
اذاا	TEST RESULTS

	Ī	ПА	-55 DEPTH TO WATER - INITIAL*: \(\psi \) AFTE	K 24	HOUF	(5:	-	·	AVI	NG.	<u> </u>
<u>Б</u> €	ક <u>દ</u>	£ ≈		hic	e Se	ole 'ery	e e	S''C	<u>e</u>	200·	TEST RESULTS Plastic Limit ⊢ Liquid Lim
Elevation (MSL) (ft)	Dept (mete	Depth (feet)	Description	Graphic	Sample No.	Sample Recovery	Sample Type	Blows per 6"	N-Value	% < #200	Plastic Limit ⊢ Elquid Lim Moisture Content - ● N-Value - [////////]
	0	0		1							10 20 30 40 50 60 70
			8 inches of TOPSOIL	,,,,,							
			Tan, moist, poorly graded fine to medium SAND (SP)				HA				
		2	Gray-Tan, moist, poorly graded fine to medium SAND (SP-SM) with				HA				
	0.8		silt to Silty fine SAND (SM)								
			Tan from 3 feet 3.	5			HA				
		4	Tan, moist to wet, poorly graded fine to medium SAND (SP) to poor graded fine to medium SAND (SP-SM) with silt	Janes e Oktor Income Income Income	2						
	1.6		Wet from 5 feet	ance one one alega			:				
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				49664 64664 49664							
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	2.4	8 (Davis to seize to det 0.55		4						-
		<u> </u>	Boring terminated at 8 ft.]				<u>[</u>
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Notes:

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

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

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

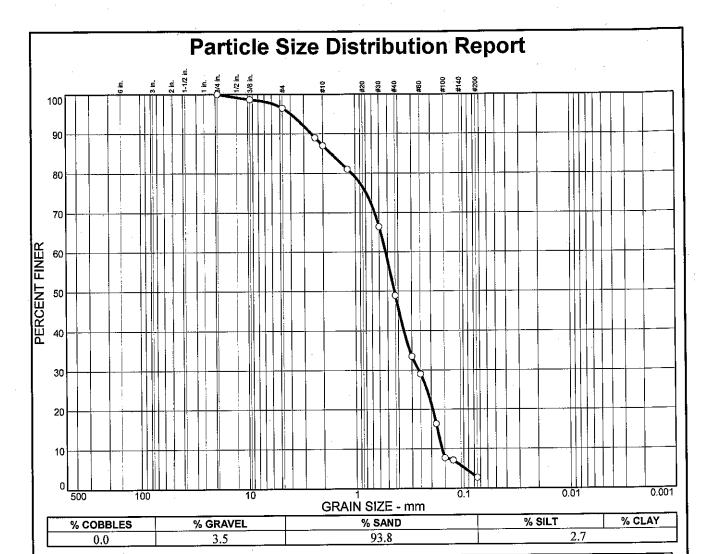
₩ater table during drilling

Depth to caving

Notes:

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



SIZE FINER PERCENT (X=NO) 0.75 in. 98.7 98.7 #4 96.5 89.0 #8 89.0 87.0 #16 81.0 81.0 #30 66.4 48.9 #50 33.5 860 #60 29.0 880 #100 7.7 7.1 #120 7.1 8200 #200 2.7	SIEVE	PERCENT	SPEC.*	PASS?
0.375 in. #4 96.5 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	SIZE	FINER	PERCENT	(X=NO)
	0.375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #120	98.7 96.5 89.0 87.0 81.0 66.4 48.9 33.5 29.0 16.3 7.7 7.1		

	orly graded SA 8%)	Soil Description ND (SP) with trace	l organics (organic content						
PL:	= NT	Atterberg Limits	PI= NT						
D ₈ D ₃ C _u	5= 1.68 0= 0.261 = 3.28	$\begin{array}{c} \underline{\text{Coefficients}} \\ D_{60} = 0.523 \\ D_{15} = 0.176 \\ C_{\text{C}} = 0.81 \end{array}$	D ₅₀ = 0.434 D ₁₀ = 0.160						
US	USCS= SP Classification 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 Location: B-1 Source of Sample:

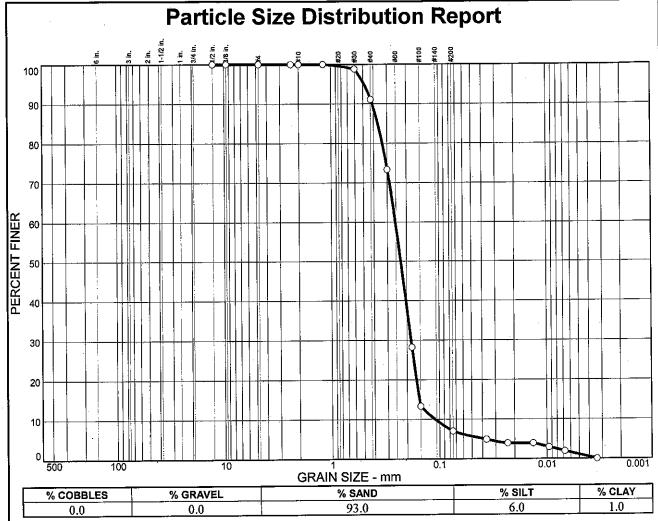
Date:

Elev./Depth: 2 to 4 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

Soil Description Poorly graded SAND (SP-SM) with silt, with trace organics (organic content = 1.8%)								
PL= NT	Atterberg Limits	PI= NT						
D ₈₅ = 0.366 D ₃₀ = 0.184 C _u = 2.30	Coefficients D ₆₀ = 0.254 D ₁₅ = 0.154 C _c = 1.20	D ₅₀ = 0.227 D ₁₀ = 0.110						
USCS= SP-SM AASHTO= A-3								
Remarks								
		· .						

Sample No.: S-5 Location: B-1 Source of Sample:

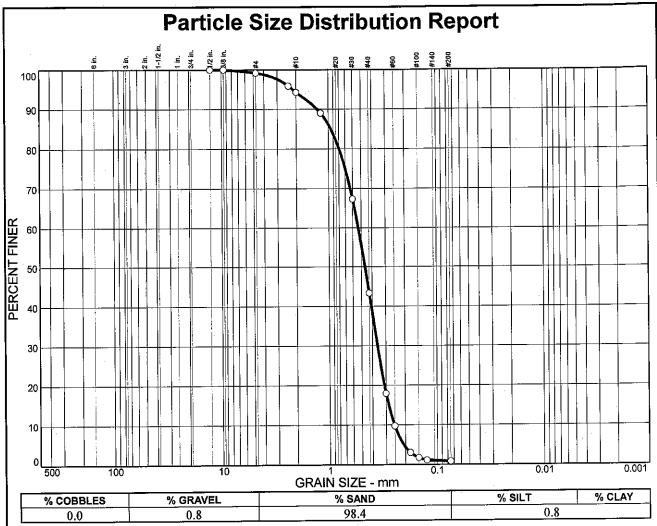
Date:

Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description	
Poorly graded SA	AND (SP)	
	ř	
PL= NT	Atterberg Limits LL= NT	PI= NT
D ₈₅ = 0.950 D ₃₀ = 0.359 C _u = 2.12	Coefficients D60= 0.534 D15= 0.284 Cc= 0.96	D ₅₀ = 0.464 D ₁₀ = 0.252
USCS= SP	Classification AASHT	ГО= A-1-b
	<u>Remarks</u>	
		_

Sample No.: S-8 Location: B-1 Source of Sample:

Date:

Elev./Depth:

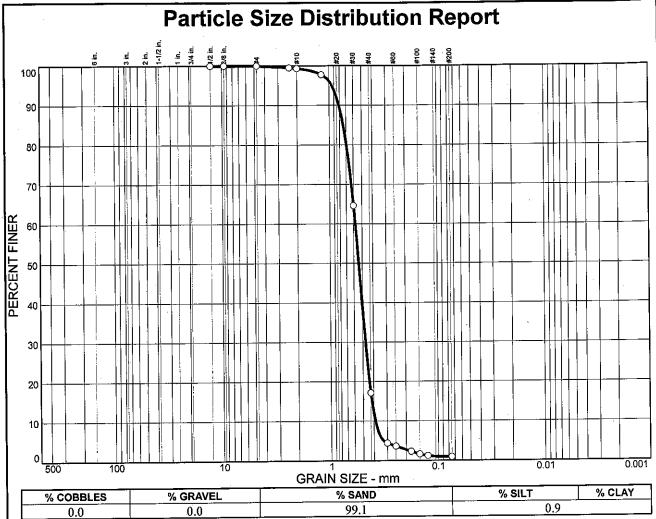
18 to 20 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description	
Poorly graded SA	AND (SP)	
•	•	
PL= NT	Atterberg Limits	PI= NT
D ₈₅ = 0.743 D ₃₀ = 0.473 C _u = 1.50	Coefficients D60= 0.580 D15= 0.415 Cc= 1.00	D ₅₀ = 0.541 D ₁₀ = 0.387
USCS= SP	Classification AASH	ГО= A-1-b
	<u>Remarks</u>	
		•

Sample No.: S-10 Location: B-1

Source of Sample:

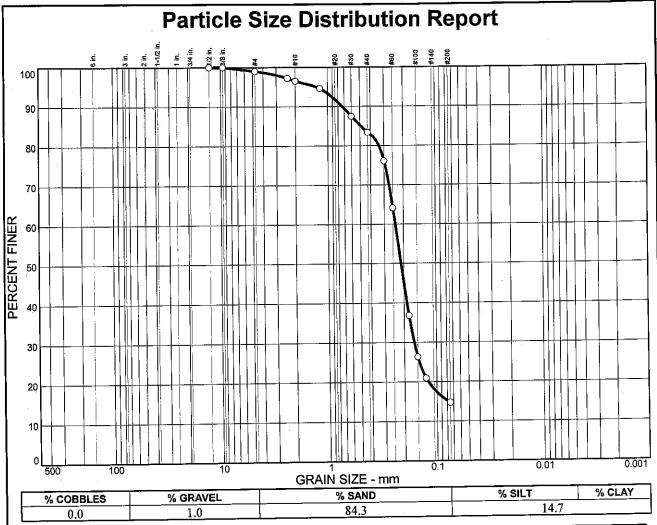
Date:

Elev./Depth: 28 to 30 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description	
Silty SAND (SM))	
DI - NE	Atterberg Limits	Pl= NT
PL= NT	LL- NI	1 1- 111
D - 0.402	Coefficients	Dec= 0.212
D ₈₅ = 0.493 D ₃₀ = 0.162	D ₆₀ = 0.238 D ₁₅ = 0.0780	D ₅₀ = 0.212 D ₁₀ =
C _u =	Cc ¹ ⊆	.0
	Classification	
USCS= SM	AASH	$\Gamma O = A-2-4(0)$
	<u>Remarks</u>	
	nell fragments retain	
sieves: #4, #8, #1	10, #16, #30, #40, #5	0

Sample No.: S-16 Location: B-1

Source of Sample:

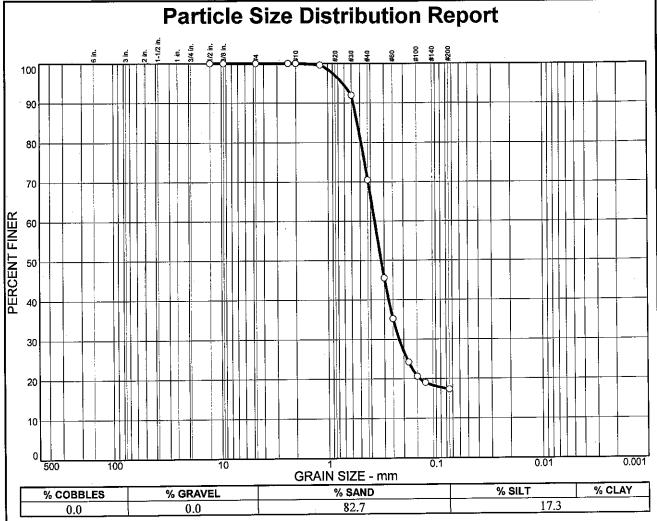
Date:

Elev./Depth: 58 to 60 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

Silty SAND (SM 1.0%)	Soil Description I) with trace organics	
PL= NT	Atterberg Limits	PI= NT
D ₈₅ = 0.532 D ₃₀ = 0.220 C _u =	Coefficients D60= 0.368 D15= Cc=	D ₅₀ = 0.321 D ₁₀ =
USCS= SM	<u>Classification</u> AASH	ΓO= A-2-4(0)
	<u>Remarks</u>	

Sample No.: S-2B

Source of Sample:

Date:

Location: B-2

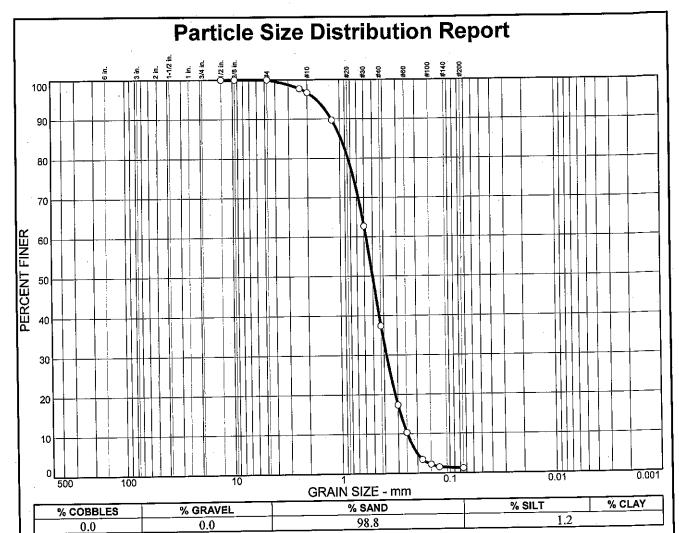
Elev./Depth: 3 to 4 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

· <u>·</u>	Soil Description	
Poorly graded SA	AND (SP)	
PL= NT	Atterberg Limits LL= NT	PI= NT
D ₈₅ = 0.976 D ₃₀ = 0.380 C _u = 2.33	Coefficients D60= 0.577 D15= 0.284 Cc= 1.01	D ₅₀ = 0.503 D ₁₀ = 0.248
USCS= SP	Classification AASH	ГО= А-1-ь
	<u>Remarks</u>	·

Sample No.: S-7 Location: B-2 Source of Sample:

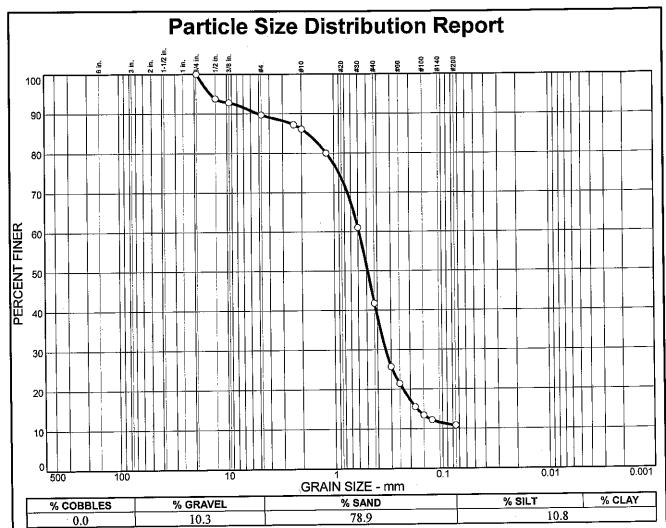
Date:

Elev./Depth: 13 to 15 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

Poorly graded SAN	Soil Description ID (SP-SM) with s	•
PL= NT	Atterberg Limit LL= NT	<u>s</u> PI= NT
D ₈₅ = 1.76 D ₃₀ = 0.337 C _u =	Coefficients D ₆₀ = 0.588 D ₁₅ = 0.174 C _c =	D ₅₀ = 0.490 D ₁₀ =
USCS= SP-SM	Classification AASH	TO= A-1-b
Visible marine she sieves: 1/2", 3/8",		ned on the following #30, #40, #50

Sample No.: S-16

Source of Sample:

Date:

Location: B-2

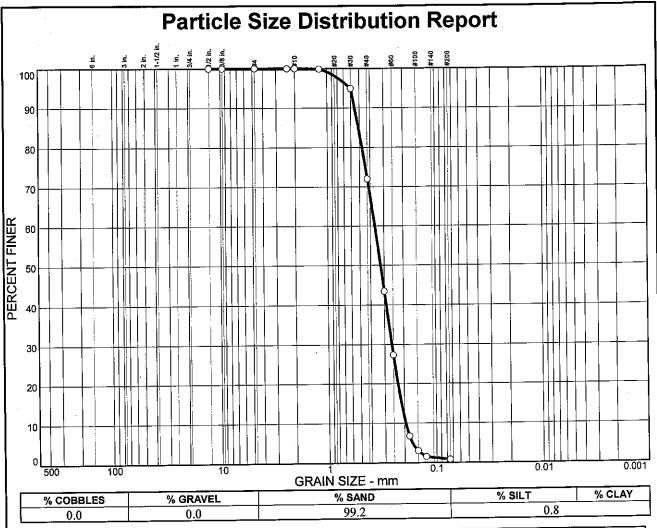
Elev./Depth: 58 to 60 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description	
Poorly graded SA	AND (SP)	
PL= NT	Atterberg Limits LL= NT	PI= NT
D ₈₅ = 0.513 D ₃₀ = 0.258 C _u = 1.87	Coefficients D60= 0.364 D15= 0.212 Cc= 0.94	D ₅₀ = 0.323 D ₁₀ = 0.195
USCS= SP	Classification AASH	TO= A-3
	<u>Remarks</u>	
	4	

Sample No.: S-5 Location: B-3

Source of Sample:

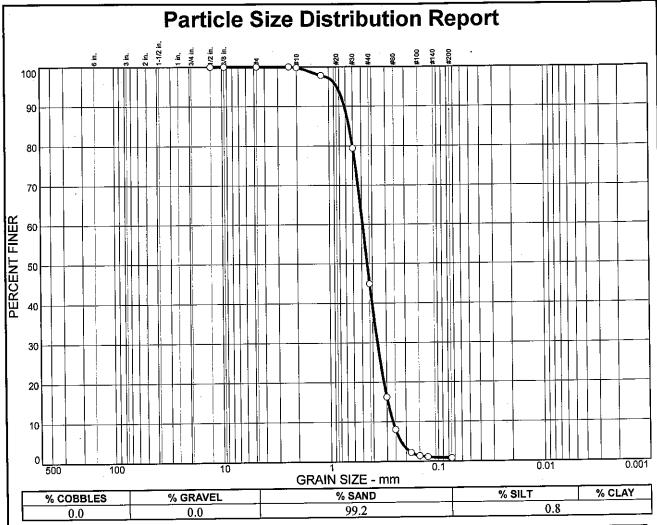
Date:

Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description	
Poorly graded SA	AND (SP)	
		•
PL= NT	Atterberg Limits LL= NT	PI= NT
D ₈₅ = 0.650 D ₃₀ = 0.363 C _u = 1.85	Coefficients D60= 0.490 D15= 0.294 C _C = 1.02	D ₅₀ = 0.446 D ₁₀ = 0.264
USCS= SP	<u>Classification</u> AASHT	O= A-1-b
	<u>Remarks</u>	

Sample No.: S-6

Source of Sample:

Date:

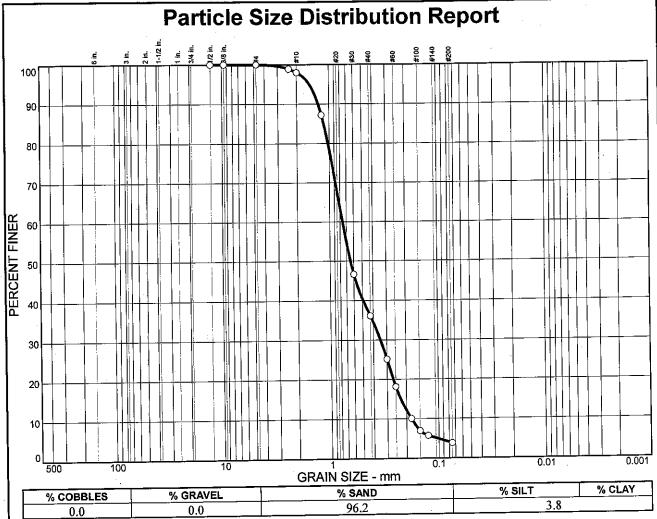
Location: B-3

Elev./Depth: 10 to 12 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SI	EVE	PERCENT	SPEC.*	PASS?
8	IZE	FINER	PERCENT	(X=NO)
	.5 in. 75 in. #4 #10 #16 #30 #40 #60 #80 #100 #200	100.0 100.0 98.9 98.0 87.2 46.6 36.1 25.1 18.1 10.0 6.9 5.7		

	Soil Description	
Poorly graded SA	AND (SP)	
	Atterberg Limits	
PL= NT	LL= NT	PI= NT
D ₈₅ = 1.13 D ₃₀ = 0.344 C _u = 4.22	Coefficients D ₆₀ = 0.760 D ₁₅ = 0.226 C _c = 0.87	D ₅₀ = 0.643 D ₁₀ = 0.180
USCS= SP	<u>Classification</u> AASH	TO= A-1-b
Visible marine s sieves: #8, #10,	Remarks hell fragments retain #16, #30	ed on the following

Sample No.: S-11 Location: B-3

Source of Sample:

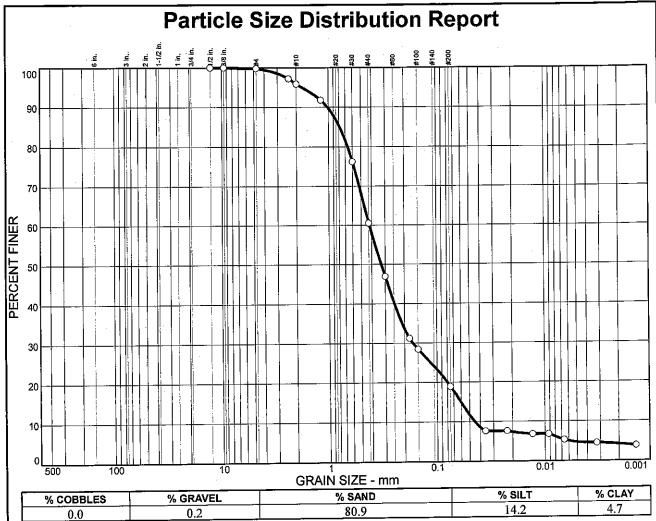
Date:

Elev./Depth: 33 to 35 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description	
Silty SAND (SM) .	
	Note: No constitution	
PL= NT	Atterberg Limits LL= NT	PI= NT
D ₈₅ = 0.788 D ₃₀ = 0.168 C _u = 9.35	Coefficients D60= 0.420 D15= 0.0604 Cc= 1.50	D ₅₀ = 0.327 D ₁₀ = 0.0449
USCS= SM	Classification AASHT	O= A-2-4(0)
	Remarks nell fragments retaine 10, #16, #30, #40, #5	

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

Source of Sample:

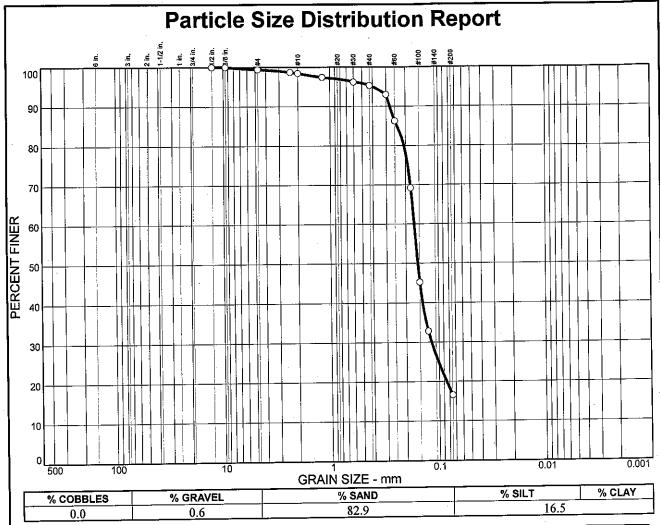
Date:

Elev./Depth: 58 to 60 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

82.9		16.3
Silty SAND (SM	Soil Description	
PL= NT	Atterberg Limits	PI= NT
D ₈₅ = 0.239 D ₃₀ = 0.117 C _u =	Coefficients D60= 0.168 D15= Cc=	D ₅₀ = 0.156 D ₁₀ =
USCS= SM	Classification AASH	TO= A-2-4(0)
	Remarks hell fragments retain 10, #16, #30, #40, #5	

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

Source of Sample:

Date:

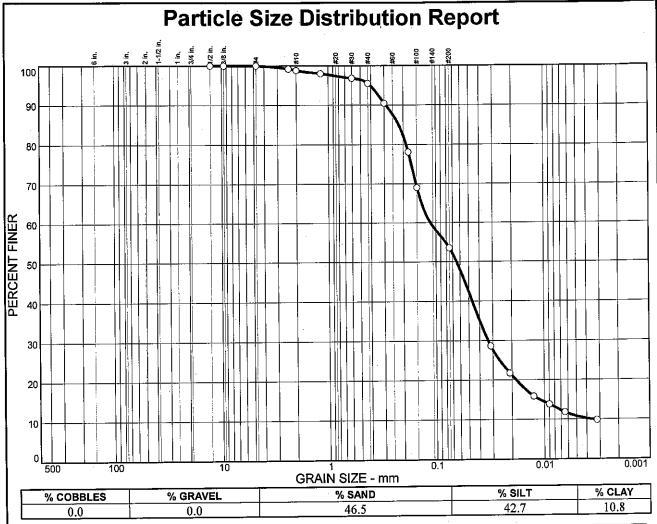
Elev./Depth: 83 to 85 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G

Fig<u>ure</u>



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

	Soil Description	
Sandy SILT (ML)	
PL= NT	Atterberg Limits LL= NT	PI= NT
D ₈₅ = 0.220 D ₃₀ = 0.0333 C _u = 31.29	$\begin{array}{c} \underline{\text{Coefficients}} \\ D60 = 0.112 \\ D15 = 0.0112 \\ C_{\text{C}} = 2.76 \end{array}$	D ₅₀ = 0.0646 D ₁₀ = 0.0036
USCS= ML	Classification AASHT	O= A-4(0)
Visible marine si sieves: #8, #10,	Remarks hell fragments retaine #16, #30, #40	ed on the following

Sample No.: S-23 Location: B-3

Source of Sample:

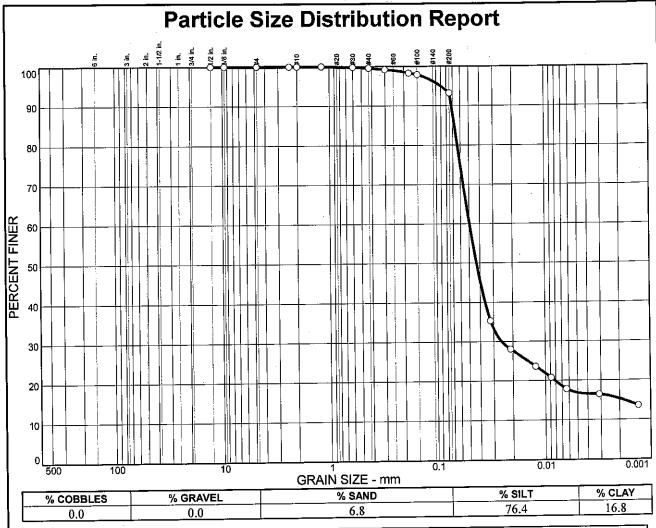
Date:

Elev./Depth: 93 to 95 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

Fat CLAY (CH)	Soil Description	<u>n</u>
PL= 22	Atterberg Limit	<u>s</u> PI= 36
D ₈₅ = 0.0680 D ₃₀ = 0.0256 C _u =	$\begin{array}{c} \underline{\text{Coefficients}} \\ \text{D}_{60} = \ 0.0497 \\ \text{D}_{15} = \ 0.0019 \\ \text{C}_{c} = \end{array}$	D ₅₀ = 0.0430 D ₁₀ =
USCS= CH		HTO= A-7-6(37)
	<u>Remarks</u>	

Sample No.: S-24

Source of Sample:

Date:

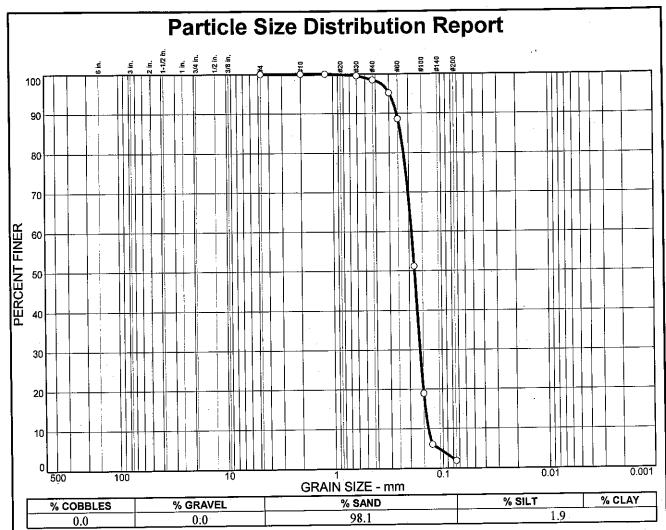
Location: B-3

Elev./Depth: 98 to 100 feet

Client: CDM

Project: Roanoke Island Water System Improvements

GET SOLUTIONS, INC. Project No: EC09-249G



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

Poorly graded fi	Soil Description ne SAND (SP) with tr	ace medium Sand
PL=	Atterberg Limits	PI=
D ₈₅ = 0.237 D ₃₀ = 0.161 C _u = 1.39	Coefficients D60= 0.190 D15= 0.145 Cc= 1.00	D ₅₀ = 0.179 D ₁₀ = 0.137
USCS= SP	Classification AASHT	O= A-3
Remarks B-5 S-5		

Sample No.: S-5 Location: B-5 Source of Sample:

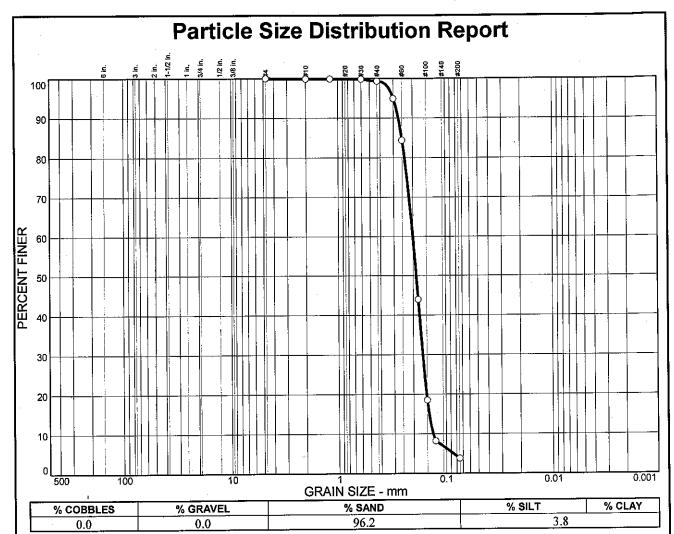
Date:

Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

Poorly graded fi	Soil Description Poorly graded fine SAND (SP) with trace medium Sand			
PL=	Atterberg Limits	PI=		
D ₈₅ = 0.252 D ₃₀ = 0.164 C _U = 1.52	Coefficients D60= 0.201 D15= 0.144 Cc= 1.02	D ₅₀ = 0.187 D ₁₀ = 0.132		
USCS= SP	USCS= SP Classification AASHTO= A-3			
Remarks B-5 S-8				

Sample No.: S-8

Source of Sample:

Date:

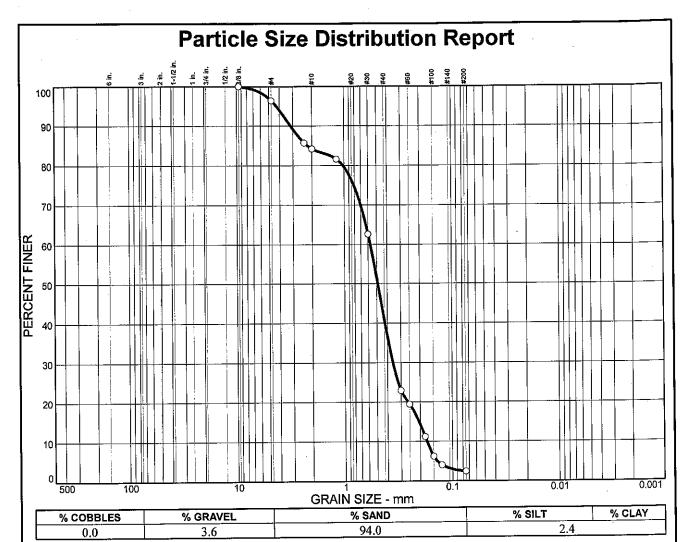
Location: B-5

Elev./Depth: 14 to 16 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

Poorly graded fin	Soil Description Poorly graded fine to medium SAND (SP) with coarse Sand			
PL=	Atterberg Limits	PI=		
D ₈₅ = 2.21 D ₃₀ = 0.356 C _u = 3.31	Coefficients D ₆₀ = 0.573 D ₁₅ = 0.206 C _c = 1.28	D ₅₀ = 0.490 D ₁₀ = 0.173		
USCS= SP	USCS= SP Classification AASHTO= A-1-b			
Remarks B-5 S-12				

Sample No.: S-12

Source of Sample:

Date:

Location: B-5

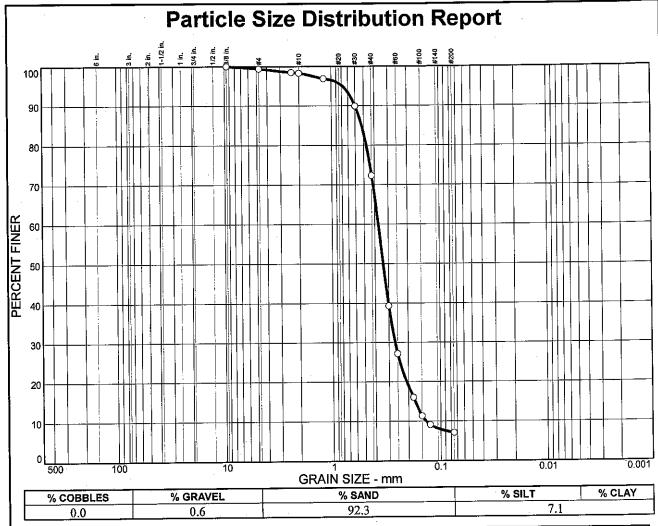
Elev./Depth: 23 to 25 feet

SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



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

	Soil Description Poorly graded fine to medium SAND (SP-SM) with Silt and trace coarse Sand				
PL=	PL= Atterberg Limits PI= PI=				
D ₈₅ = 0.523 D ₃₀ = 0.264 C _u = 2.70	Coefficients D60= 0.372 D15= 0.174 Cc= 1.35	D ₅₀ = 0.337 D ₁₀ = 0.138			
USCS= SP-SM	USCS= SP-SM Classification AASHTO= A-3				
B-6 S-4					

Sample No.: S-4

Source of Sample:

Date:

Elev./Depth: 6 to 8 feet

Figure

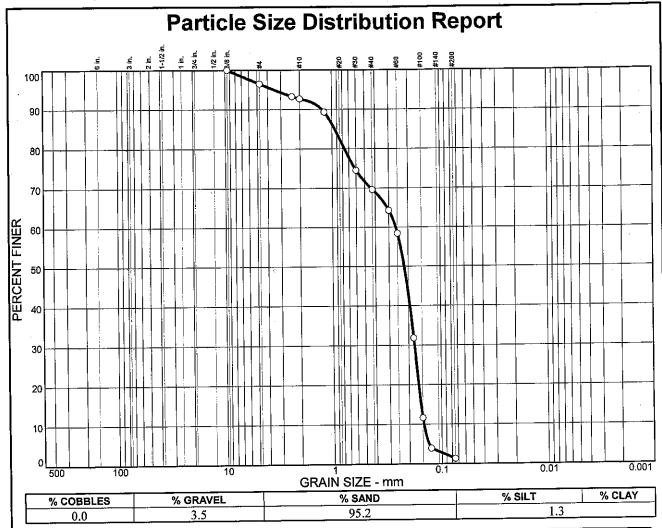
Location: B-6

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: <u>EC09-249G</u>

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SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #120 #200	100.0 96.5 93.3 92.7 89.3 74.5 69.6 64.3 58.4 31.8 11.6 3.9		

Soil Description Poorly graded fine to medium SAND (SP-SM) with Silt and trace coarse Sand			
PL=	Atterberg Limits	PI=	
D ₈₅ = 0.945 D ₃₀ = 0.177 C _u = 1.77	Coefficients D60= 0.259 D15= 0.156 Cc= 0.82	D ₅₀ = 0.218 D ₁₀ = 0.147	
USCS= SP	Classification AASHT	⁻ O= A-3	
<u>Remarks</u> B-7 S-10			

Sample No.: S-10 (Bottom))

Location: B-7

Source of Sample:

Date:

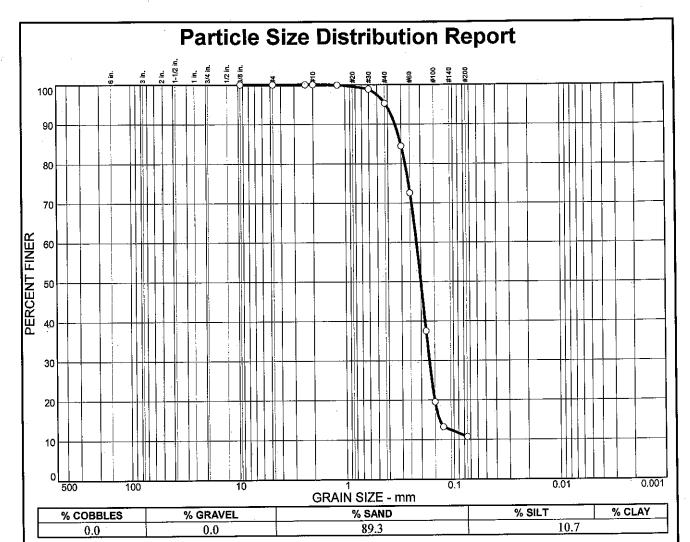
Elev./Depth: 18.5 to 20

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Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 100.0 100.0 99.9 98.9 95.3 84.5 72.6 37.5 19.5 13.2 10.7		
		,	

Soil Description Poorly graded fine SAND (SP-SM) with Silt and trace medium Sand			
PL=	Atterberg Limits	PI=	
D ₈₅ = 0.303 D ₃₀ = 0.168 C _u =	$\begin{array}{c} \underline{\text{Coefficients}} \\ D_{60} = \ 0.219 \\ D_{15} = \ 0.136 \\ C_{c} = \end{array}$	D ₅₀ = 0.200 D ₁₀ =	
USCS= SP-SM	Classification AASH	ΓO= A-2-4(0)	
B-8 S-4	<u>Remarks</u>		

Sample No.: S-4 Location: B-8 Source of Sample:

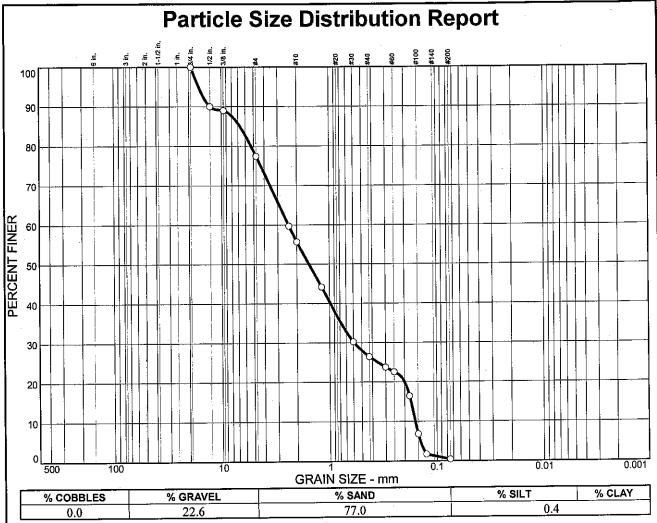
Date:

Elev./Depth: 6 to 8 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.75 in. 0.5 in. 375 in. 44 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 90.0 89.0 77.4 59.7 55.7 44.1 30.2 26.4 23.7 22.5 16.4 6.8 1.7 0.4		

coarse SAND (SP) v terberg Limits L=	with trace fine Stone
	DI-
	D!-
	F 1-
	• •
Coefficients D ₆₀ = 2.39 D ₁₅ = 0.175 C _c = 0.92	D ₅₀ = 1.55 D ₁₀ = 0.160
Classification AASHTO=	: A-1-b
<u>Remarks</u>	
	060= 2.39 015= 0.175 0 _C = 0.92 Classification AASHTO=

Sample No.: S-11 (Top)

Source of Sample:

Date:

Elev./Depth: 23 to 24.5

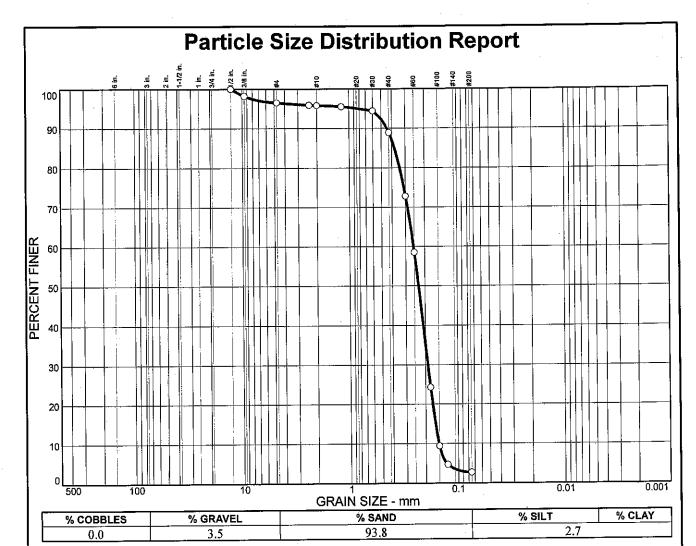
Location: B-8

Client: CDM

Project: Roanoke Island Water System Improvements

GET SOLUTIONS, INC.

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.5 in. .375 in. #8 #10 #16 #30 #40 #50 #60 #80 #100 #120	100.0 98.2 96.5 95.9 95.8 95.5 94.4 88.9 72.8 58.5 24.3 9.4 4.7 2.7		

Poorly graded fit Sand and trace fit		n (SP) with trace coarse
PL=	Atterberg Limit	<u>s</u> Pl=
D ₈₅ = 0.378 D ₃₀ = 0.190 C _u = 1.68	Coefficients D ₆₀ = 0.254 D ₁₅ = 0.163 C _c = 0.94	D ₅₀ = 0.229 D ₁₀ = 0.152
USCS= SP	Classification AASH	ITO= A-3
B-9 S-5	<u>Remarks</u>	

Sample No.: 'S-5 Location: B-9 Source of Sample:

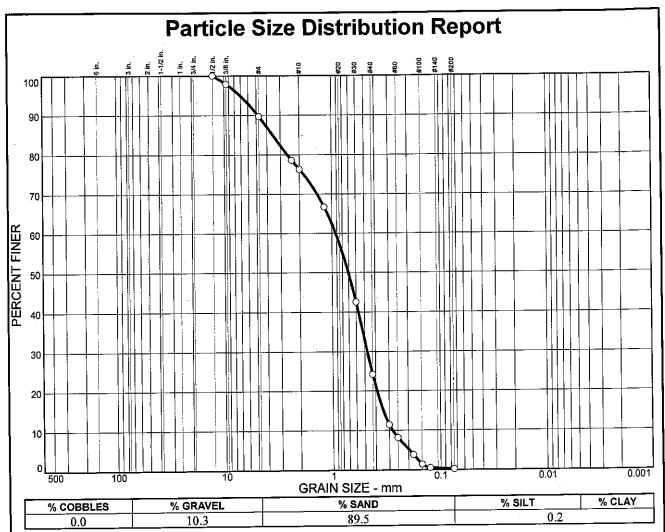
Date:

Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.5 in. .375 in. #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 97.9 89.7 78.6 76.3 66.7 42.5 24.2 11.4 8.1 3.8 1.4 0.5 0.2		
		· ·	

Poorly graded fin	Soil Description ne to coarse SAND (S	SP) with little fine Stone
PL=	Atterberg Limits	<u>i</u> Pl=
D ₈₅ = 3.54 D ₃₀ = 0.476 C _u = 3.29	Coefficients D60= 0.924 D15= 0.340 Cc= 0.87	D ₅₀ = 0.705 D ₁₀ = 0.281
USCS= SP	Classification AASH	ΓO= A-1-b
B-9 S-10	<u>Remarks</u>	

Sample No.: S-10 Location: B-9

Source of Sample:

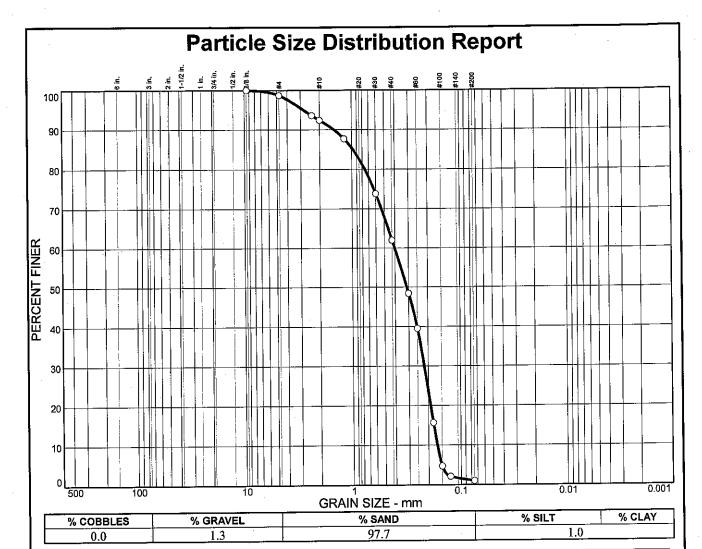
Date:

Elev./Depth: 18 to 20 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 98.7 93.6 92.4 87.7 73.8 62.0 48.4 39.5 15.6 4.7 2.1 1.0		

Soil Description Poorly graded fine to medium SAND (SP) with trace coarse Sand and trace fine Stone			
PL=	Atterberg Limits	PI=	
D ₈₅ = 0.978 D ₃₀ = 0.217 C _u = 2.42	Coefficients D60= 0.403 D15= 0.179 Cc= 0.71	D ₅₀ = 0.312 D ₁₀ = 0.166	
USCS= SP	Classification AASH	ГО= A-3	
B-10 S-8	<u>Remarks</u>		

Sample No.: S-8 Location: B-10 Source of Sample:

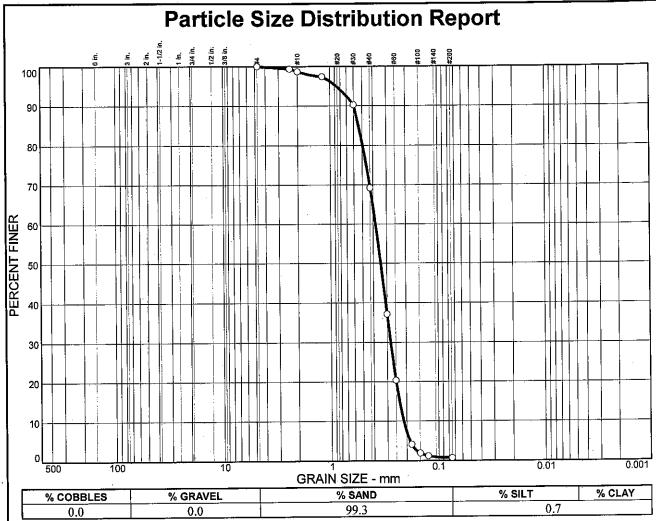
Date:

Elev./Depth: 14 to 16 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.4 98.7 97.4 90.3 69.2 37.1 20.3 4.1 1.9 1.2 0.7		

Poorly graded fi	Soil Description ne to medium SAND	(SP) with trace coarse
PL≌	Atterberg Limits	<u>5</u> Pl=
D ₈₅ = 0.543 D ₃₀ = 0.279 C _u = 1.79	Coefficients D ₆₀ = 0.381 D ₁₅ = 0.232 C _C = 0.96	D ₅₀ = 0.342 D ₁₀ = 0.213
USCS= SP	Classification AASH	TO= A-3
B-11 S-5	<u>Remarks</u>	

Sample No.: S-5 Location: B-11 Source of Sample:

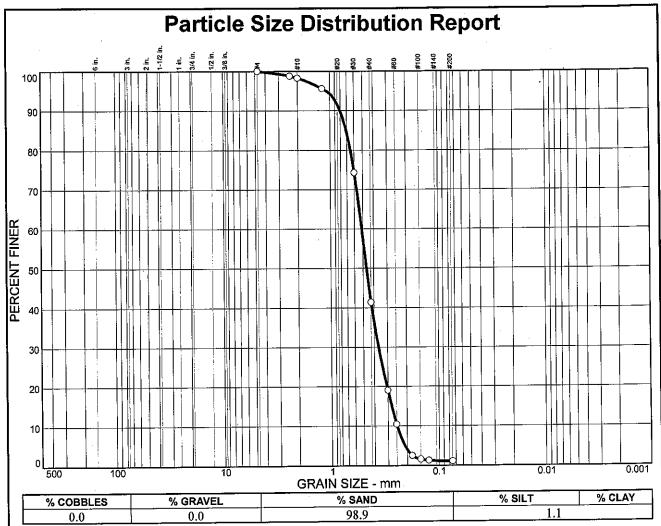
Date:

Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120	100.0 98.8 98.3 95.6 74.3 41.4 19.0 10.4 2.5 1.6 1.3 1.1		

Poorly graded fin	Soil Description ne to medium SAND	(SP) with trace coarse
PL=	Atterberg Limits	<u>s</u> . Pl=
D ₈₅ = 0.709 D ₃₀ = 0.365 C _u = 2.08	Coefficients D60= 0.515 D15= 0.277 Cc= 1.04	D ₅₀ = 0.466 D ₁₀ = 0.247
USCS= SP	Classification AASH	TO= A-1-b
B-11 S-7	<u>Remarks</u>	1.

Sample No.: S-7 Location: B-11 Source of Sample:

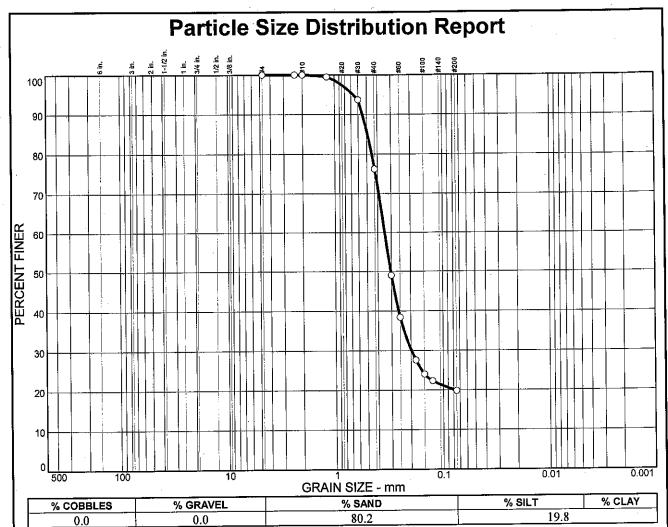
Date:

Elev./Depth: 12 to 14 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 100.0 99.5 93.7 76.2 49.0 38.4 27.6 24.0 22.3 19.8		

	Soil Description	
Silty fine to medi Organic Content	• ,	
PL=	Atterberg Limits	e Pl=
D ₈₅ = 0.493 D ₃₀ = 0.198 C _u =	Coefficients D ₆₀ = 0.346 D ₁₅ = C _c =	D ₅₀ = 0.304 D ₁₀ =
USCS= SM	Classification AASH	ΓO= A-2-4(0)
D 10	<u>Remarks</u>	
B-12 S-2		
Organic Content	= 0.9%	

Sample No.: S-2 (Bottom) Location: B-12 Source of Sample:

Date:

Fle

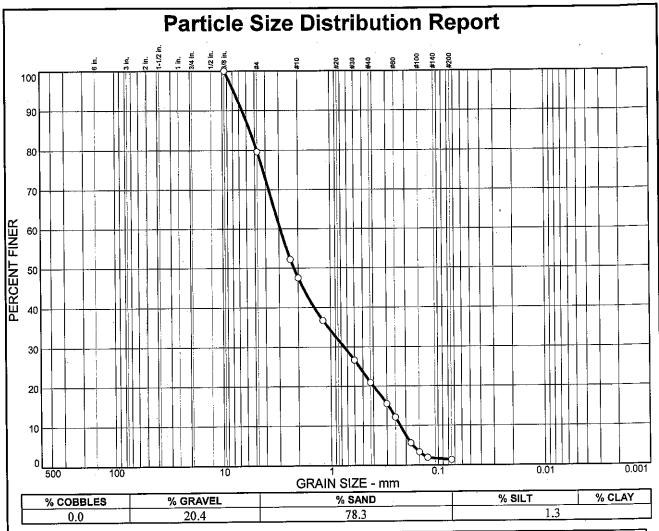
Elev./Depth: 2.5 to 4 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 79.6 52.2 47.5 36.7 26.6 20.9 15.5 12.1 5.6 3.3 1.9		

	Soil Description			
Poorly graded fit	Poorly graded fine to coarse SAND (SP) with fine Stone			
	Atterberg Limits	•		
PL=	LL=	PI=		
	Coefficients			
$D_{85} = 5.55$	$D_{60} = 2.93$	$D_{50} = 2.19$		
$D_{30}^{2} = 0.752$ $C_{11}^{2} = 12.96$	$D_{15}^{15} = 0.291$ $C_{c}^{2} = 0.85$	$D_{10}^{30} = 0.226$		
O ₍₁ 12.50	<u> </u>			
USCS= SP	<u>Classification</u> AASH	TO= A-1-a		
Remarks				
B-12				
S-7				
	· <u></u>			

Sample No.: S-7

Source of Sample:

Date:

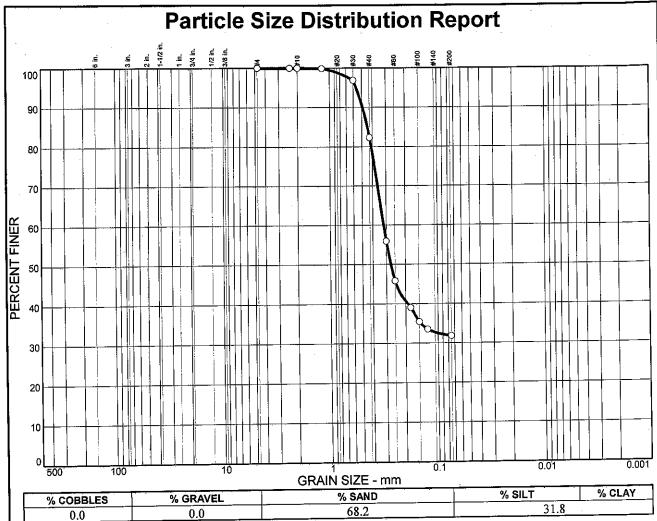
Location: B-12

Elev./Depth: 12 to 14 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 100.0 99.9 96.9 82.3 55.9 45.8 39.0 35.4 33.5 31.8		

Silty, Sandy PEA	Soil Description AT (PT)	
PL=	Atterberg Limits	PI=
D ₈₅ = 0.445 D ₃₀ = C _u =	<u>Coefficients</u> D ₆₀ = 0.317 D ₁₅ = C _c =	D ₅₀ = 0.273 D ₁₀ =
USCS= PT	<u>Classification</u> AASHT	O= A-8
B-13 S-5	Remarks	

Sample No.: S-5 Location: B-13 Source of Sample:

Date:

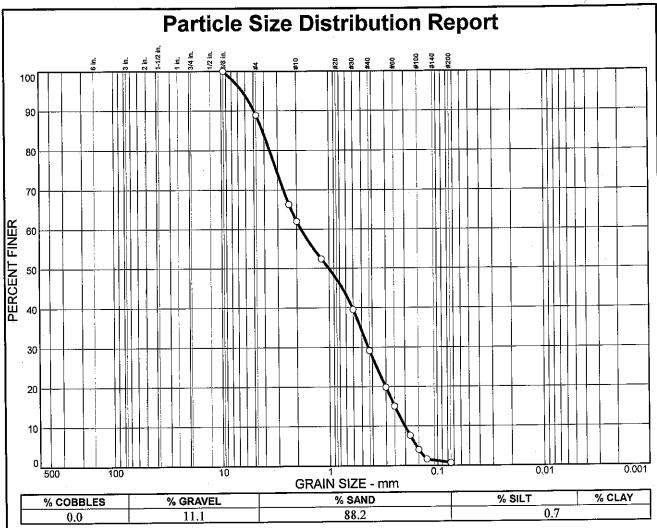
Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



٢	SIEVE	PERCENT	SPEC.*	PASS?
l	SIZE	FINER	PERCENT	(X=NO)
	.375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 88.9 66.3 62.0 52.4 39.5 29.1 19.8 15.0 7.6 4.0 1.6		

Poorly graded fi	Soil Description ne to coarse SAND (S	SP) with trace fine Stone
PL=	Atterberg Limits LL=	PI=
D ₈₅ = 4.15 D ₃₀ = 0.438 C _u = 9.07	D ₆₀ = 1.83 D ₁₅ = 0.250 C _c = 0.52	D ₅₀ = 1.01 D ₁₀ = 0.201
USCS= SP	Classification AASH	ΓO= A-1-b
B-13 S-9	Remarks	

Sample No.: S-9

Source of Sample:

Date:

Elev./Depth: 16 to 18 feet

Location: B-13

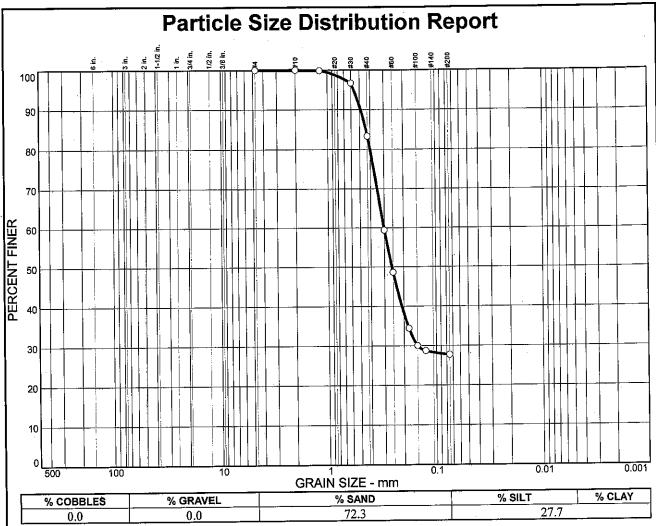
Client: CDM

Project: Roanoke Island Water System Improvements

SOLUTIONS, INC.

GET

Project No: EC09-249G



[SIEVE	PERCENT	SPEC.*	PASS?
ı	SIZE	FINER	PERCENT	(X=NO)
	#4 #10 #16 #30 #40 #50 #60 #80 #100 #120	100.0 100.0 99.9 96.7 83.3 59.4 48.6 34.4 30.0 28.7 27.7		
- :				

<u> </u>	Soil Description	1
Silty fine to med	ium SAND (SM)	
	•	
PL=	Atterberg Limits	Pl=
D ₈₅ = 0.439 D ₃₀ = 0.150 C _u =	Coefficients D60= 0.303 D15= Cc=	D ₅₀ = 0.257 D ₁₀ =
USCS= SM	Classification AASH	TO= A-2-4(0)
	<u>Remarks</u>	
B-14 S-2		

Sample No.: S-2 Location: B-14 Source of Sample:

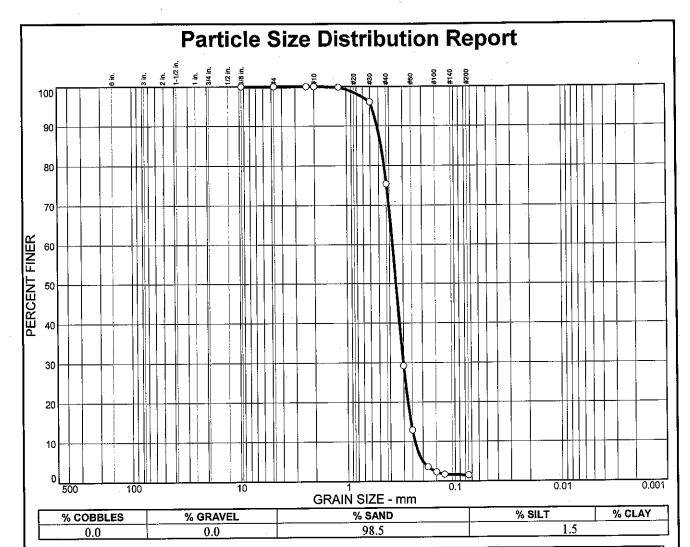
Date:

Elev./Depth: 2 to 4 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
.375 in. #4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 100.0 100.0 99.8 96.1 75.4 29.2 12.9 3.6 2.3 1.7		

	Soil Description	
Poorly graded fir fragments	ne to medium SAND (S	SP) with trace root
PL=	Atterberg Limits LL=	Pl=
D ₈₅ = 0.475 D ₃₀ = 0.302 C _u = 1.58	Coefficients D60= 0.376 D15= 0.258 C _C = 1.02	D ₅₀ = 0.350 D ₁₀ = 0.237
USCS= SP	Classification AASHTO	D= A-3
D 14	<u>Remarks</u>	
B-14 S-5		
	·	•

Sample No.: S-5 Location: B-14 Source of Sample:

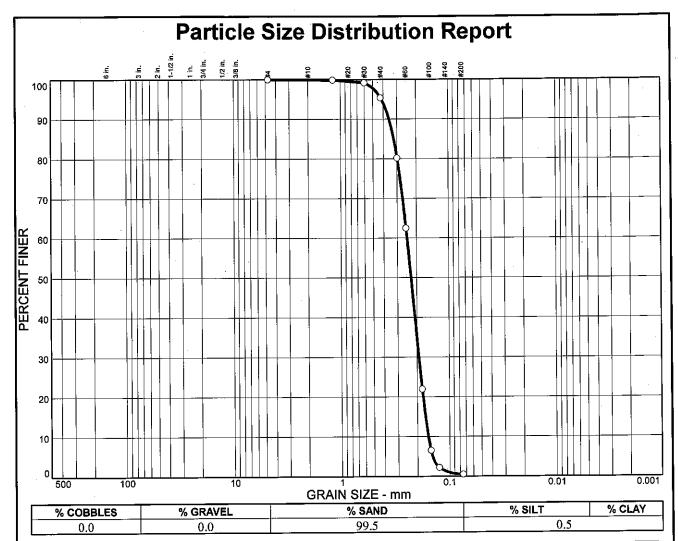
Date:

Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 99.2 95.4 80.2 62.5 21.9 6.5 2.2 0.5		

Poorly graded fin	Soil Description to medium SAND	
PL=	Atterberg Limits	<u>\$</u> Pl=
D ₈₅ = 0.322 D ₃₀ = 0.193 C _u = 1.54	Coefficients D ₆₀ = 0.245 D ₁₅ = 0.168 C _c = 0.96	D ₅₀ = 0.226 D ₁₀ = 0.159
USCS= SP	Classification AASH	TO= A-3
B-18 S-4	<u>Remarks</u>	

Sample No.: S-4

Source of Sample:

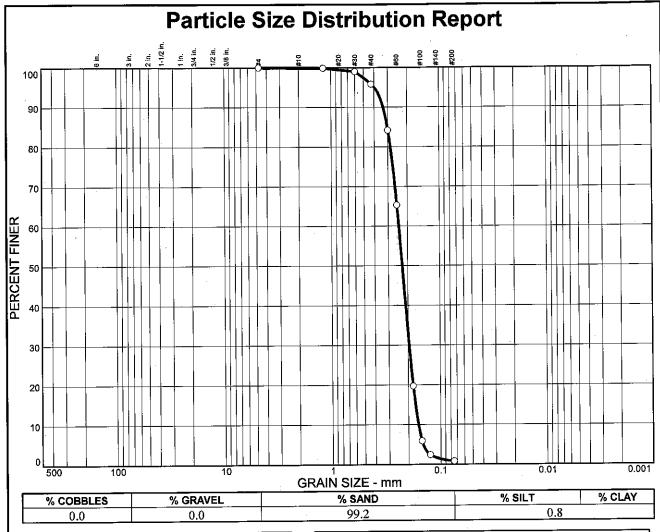
Date: 3/23/10 Elev./Depth: 6 to 8 feet

Location: B-18

Project: Roanoke Island Water System Improvements

Project No: EC09-249G

GET SOLUTIONS, INC.



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 99.0 95.8 84.2 65.3 19.7 5.9 2.4 0.8		

Poorly graded fit	ne to medium SAND	(SP)
PL=	Atterberg Limits	Pl=
D ₈₅ = 0.303 D ₃₀ = 0.196 C _u = 1.49	Coefficients D60= 0.240 D15= 0.172 Cc= 0.98	D ₅₀ = 0.224 D ₁₀ = 0.162
USCS= SP	Classification AASHT	O= A-3
B-19 S-3	<u>Remarks</u>	

Sample No.: S-3 Location: B-19 Source of Sample:

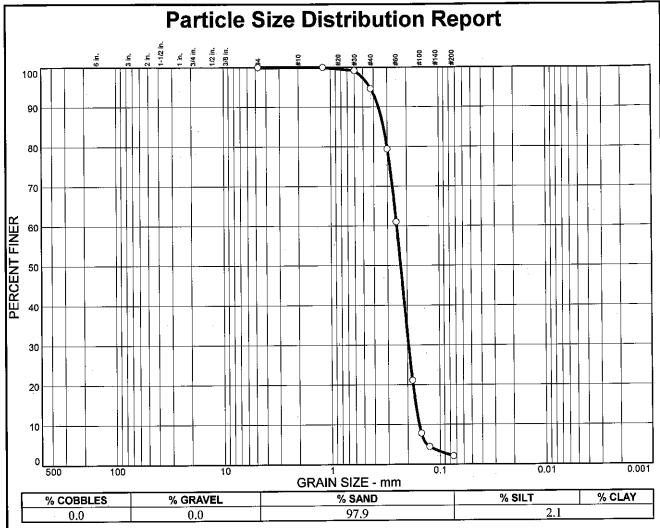
Date: 3-23-10

Elev./Depth: 4 to 6 feet

GET SOLUTIONS, INC. Project No: EC09-249G

Client: CDM

Project: Roanoke Island Water System Improvements



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 99.2 94.6 79.4 61.0 21.1 7.8 4.4 2.1	•	

Poorly graded f	ine to medium SAND (S	SP)
PL=	Atterberg Limits	PI=
D ₈₅ = 0.325 D ₃₀ = 0.195 C _u = 1.58	Coefficients D60= 0.248 D15= 0.168 C _C = 0.98	D ₅₀ = 0.229 D ₁₀ = 0.157
USCS= SP	Classification AASHTO)= A-3
B-20 S-3	<u>Remarks</u>	

Sample No.: S-3 Location: B-20 Source of Sample:

Date: 3-23-10

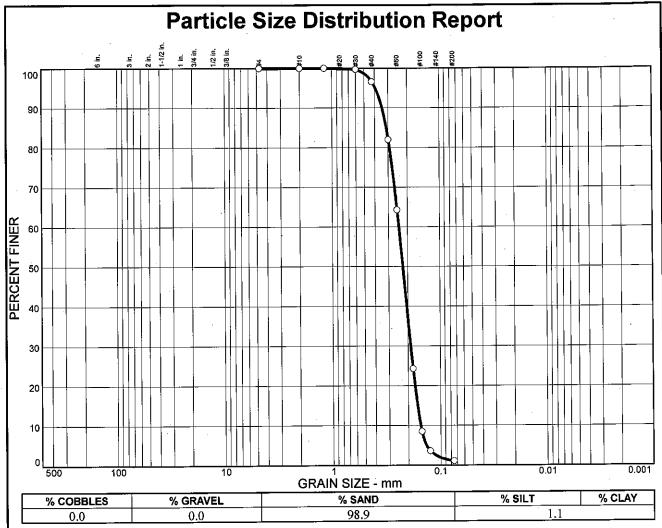
Elev./Depth: 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 100.0 99.7 96.6 82.0 64.3 24.3 8.5 3.6		
			-

Poorly graded fin	Soil Description Poorly graded fine to medium SAND (SP)				
	Attorborg Limito	·			
PL=	Atterberg Limits LL=	Pi=			
D ₈₅ = 0.313 D ₃₀ = 0.189 C _u = 1.57	Coefficients D ₆₀ = 0.241 D ₁₅ = 0.164 C _c = 0.97	D ₅₀ = 0.222 D ₁₀ = 0.154			
USCS= SP	Classification AASHT	O= A-3			
B-21 S-4	<u>Remarks</u>				

Sample No.: S-4 Location: B-21 Source of Sample:

Date: 3-23-10 **Elev./Depth:** 6 to 8 feet

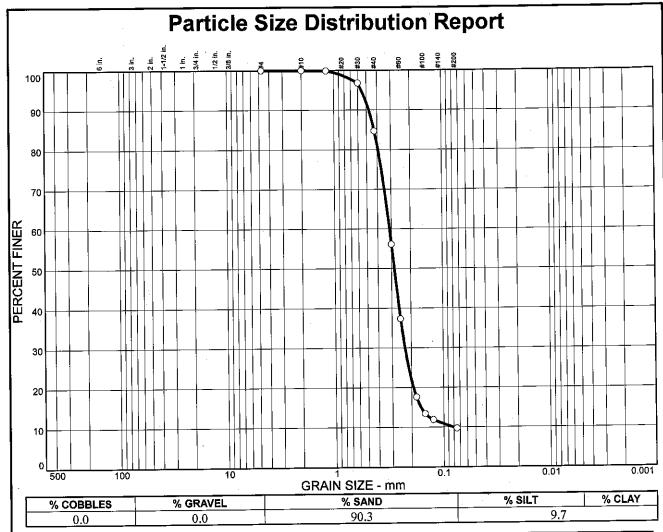
Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G

Figure

GET SOLUTIONS, INC.



ſ	SIEVE	PERCENT	SPEC.*	PASS?
	SIZE	FINER	PERCENT	(X=NO)
	#4 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 99.9 96.8 84.7 56.1 37.3 17.6 13.4 11.9 9.7		

Soil Description Poorly graded fine to medium SAND (SP-SM)			
10011) B		,	
PL=	Atterberg Limits	<u>s</u> Pl=	
D ₈₅ = 0.427 D ₃₀ = 0.229 C _u = 3.85	Coefficients D ₆₀ = 0.312 D ₁₅ = 0.164 C _c = 2.07	D ₅₀ = 0.283 D ₁₀ = 0.0811	
USCS= SP-SM AASHTO= A-3			
	<u>Remarks</u>		
B-22 S-3			
<u></u>			

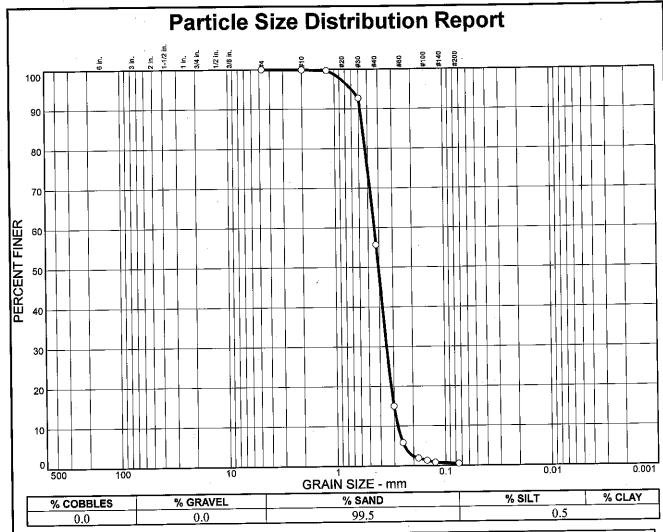
Sample No.: S-3 Location: B-22 Source of Sample:

Date: 3-23-10 **Elev./Depth:** 4 to 6 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



	SIEVE	PERCENT	SPEC.*	PASS?
1	SIZE	FINER	PERCENT	(X=NO)
	#4 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 99.7 92.7 55.7 15.0 5.8 1.9 1.3 0.8		
	·			

Poorly graded fi	Soil Description Poorly graded fine to medium SAND (SP)				
PL=	Atterberg Limits LL=	PI=			
D ₈₅ = 0.555 D ₃₀ = 0.347 C _u = 1.58	Coefficients D ₆₀ = 0.440 D ₁₅ = 0.300 C _c = 0.99	D ₅₀ = 0.406 D ₁₀ = 0.278			
USCS= SP	Classification AASHT	TO= A-3 —			
B-22 S-5	<u>Remarks</u>				

Sample No.: S-5 Location: B-22 Source of Sample:

Date: 3-23-10

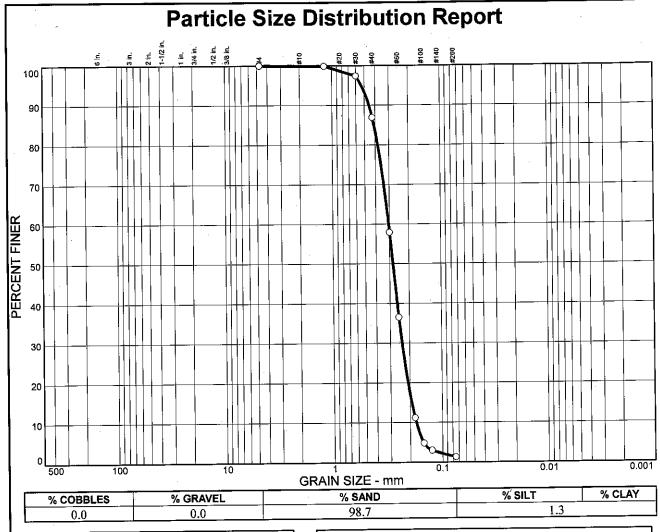
Elev./Depth: 8 to 10 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 97.4 86.9 57.9 36.5 11.2 4.8 3.0 1.3		

_,,-	Soil Description Page 14 conded fine to medium SAND (SP)					
	Poorly graded fine to medium SAND (SP)					
	PL=	Atterberg Limits LL=	PI=			
٠	D ₈₅ = 0.411 D ₃₀ = 0.235 C _u = 1.74	Coefficients D60= 0.306 D15= 0.193 Cc= 1.03	D ₅₀ = 0.281 D ₁₀ = 0.175			
	USGS= SP	Classification AASHT	O= A-3			
	B-23 S-4	<u>Remarks</u>				

Sample No.: S-4 Location: B-23 Source of Sample:

Date: 3-23-10

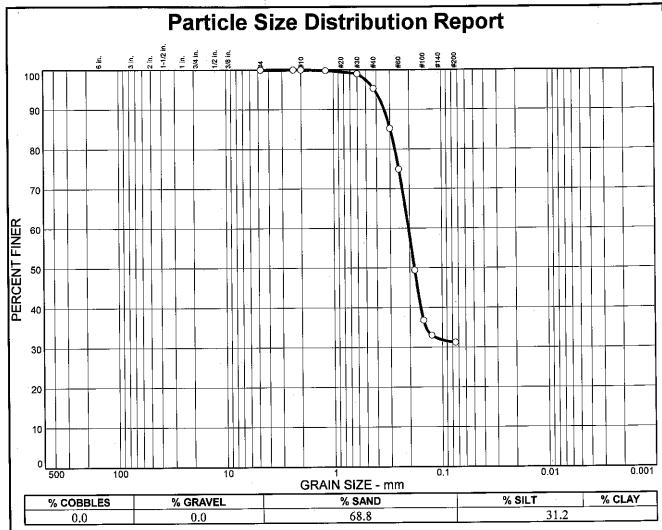
Elev./Depth: 6 to 8 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 100.0 99.8 99.0 95.3 85.2 74.9 49.4 36.8 33.0 31.2		
	·		

Silty fine to med	Soil Description Silty fine to medium SAND (SM) with clay			
PL=	Atterberg Limits	<u>\$</u> Pl=		
D ₈₅ = 0.299 D ₃₀ = C _u =	<u>Coefficients</u> D ₆₀ = 0.205 D ₁₅ = C _c =	D ₅₀ = 0.181 D ₁₀ =		
USCS= SM	Classification AASH	TO=A-2-4(0)		
B-24 S-2	<u>Remarks</u>			

Sample No.: S-2/B Location: B-24 Source of Sample:

Date: 3-23-10

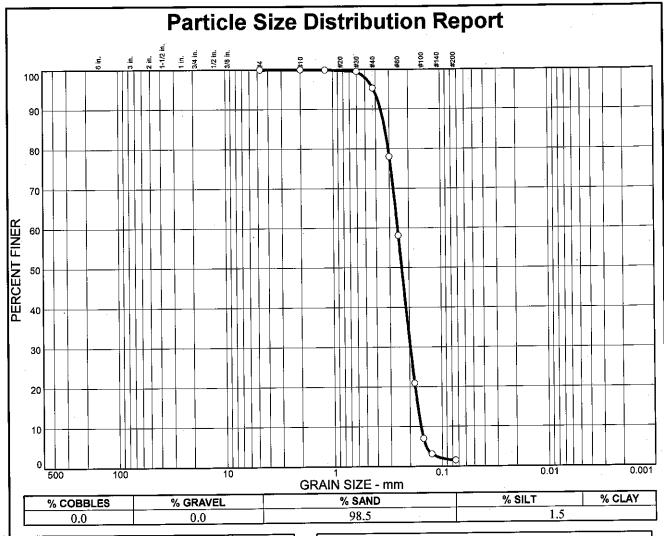
Elev./Depth: 3 to 4 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 99.9 99.5 95.3 78.0 58.1 20.9 7.0 3.1 1.5		
·			

Poorly graded fi	Soil Description ne to medium SAND ((SP)
PL=	Atterberg Limits LL=	· PI=
D ₈₅ = 0.329 D ₃₀ = 0.197 C _u = 1.61	Coefficients D60= 0.254 D15= 0.169 Cc= 0.96	D ₅₀ = 0.234 D ₁₀ = 0.158
USCS= SP	Classification AASHT	O= A-3
B-24	<u>Remarks</u>	
S-3		

Sample No.: S-3/B Location: B-24 Source of Sample:

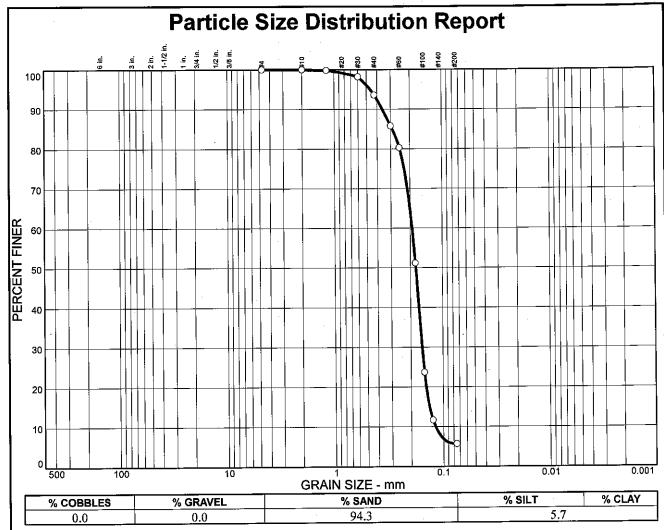
Date: 3-23-10 **Elev./Depth:** 5 to 6 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



	SIEVE	PERCENT	SPEC.*	PASS?
١	SIZE	FINER	PERCENT	(X=NO)
	#4 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 100.0 99.8 98.2 93.6 85.8 80.3 51.2 23.7 11.7 5.7		•

Poorly graded fir	Soil Description Poorly graded fine to medium SAND (SP-SM) with silt				
PL=	Atterberg Limit	<u>s</u> · PI≕			
D ₈₅ = 0.290 D ₃₀ = 0.157 C _u = 1.63	Coefficients D ₆₀ = 0.192 D ₁₅ = 0.135 C _c = 1.09	D ₅₀ = 0.179 D ₁₀ = 0.118			
USCS= SP-SM	Classification AASH	TO= A-3			
B-25 S-3	<u>Remarks</u>				

Sample No.: S-3 Location: B-25 Source of Sample:

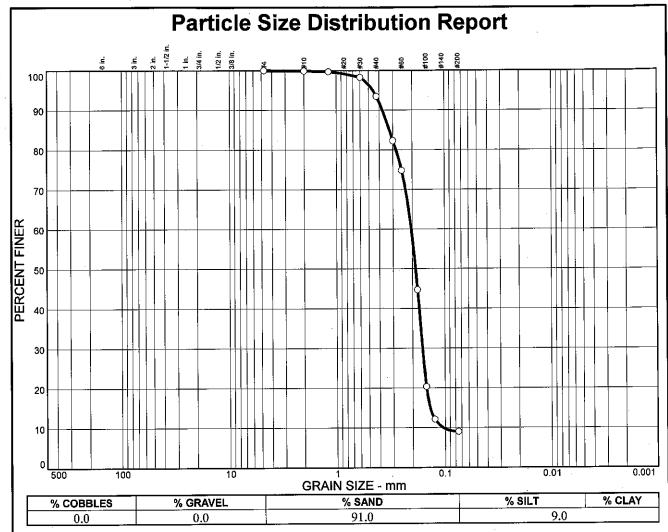
Date: 3-23-10

Elev./Depth: 4 to 6 feet

GET SOLUTIONS, INC.

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 99.7 98.3 93.5 82.3 74.8 44.7 20.3 12.1 9.0		

Soil Description				
Poorly graded fir	Poorly graded fine to medium SAND (SP-SM)			
PL=	Atterberg Limits LL=	PI=		
D ₈₅ = 0.323 D ₃₀ = 0.163 C _u = 1.95	Coefficients D60= 0.205 D15= 0.139 Cc= 1.23	D ₅₀ = 0.187 D ₁₀ = 0.105		
USCS=SP-SN	Classification AASHT	O=A-3		
<u>Remarks</u>				
B-26 S-6				

Sample No.: S-6 Location: B-26 Source of Sample:

Date: 3-23-10

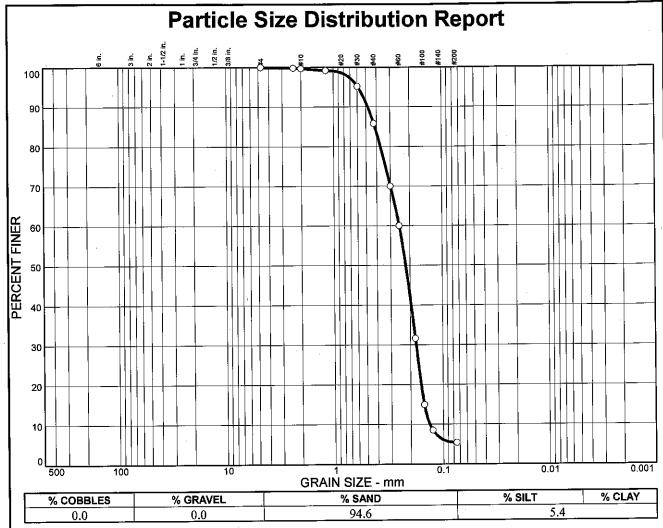
Elev./Depth: 10 to 12 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.8 99.7 99.2 95.2 85.8 70.0 60.0 31.6 14.9 8.5 5.4		

	Soil Description Poorly graded fine to medium SAND (SP-SM) with organics Organic Content = 3.7%			
PL=	Atterberg Limits	PI=		
D ₈₅ = 0.416 D ₃₀ = 0.177 C _u = 1.86	Coefficients D60= 0.250 D15= 0.150 C _C = 0.94	D ₅₀ = 0.219 D ₁₀ = 0.134		
— USGS=—SP-SM	Classification	FQ=_A-3		
Remarks				
B-27 S-3				
Organic Content	= 3.74%	. <u> </u>		

Sample No.: S-3 Location: B-27 Source of Sample:

Date: 3-23-10

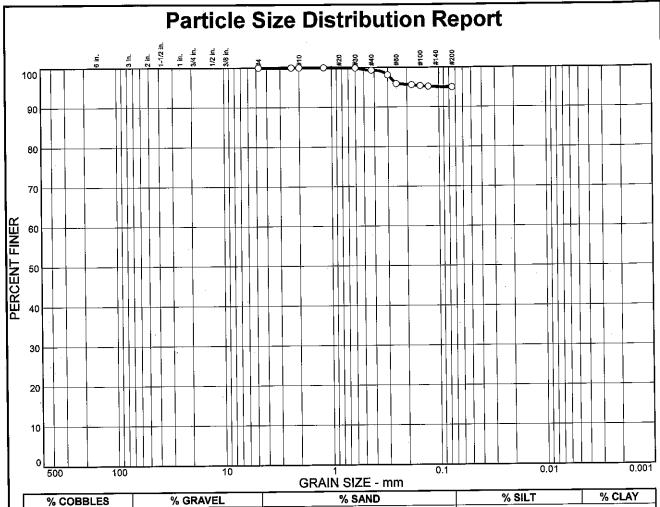
Elev./Depth: 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	5.0	95.0	
0.0				

	SIEVE	PERCENT	SPEC.*	PASS?
١	SIZE	FINER	PERCENT	(X=NO)
	#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120	100.0 100.0 100.0 100.0 99.9 99.3 98.1 95.9 95.6 95.4 95.2 95.0		

Soil Description				
Fat CLAY (CH) with trace fine sand	d		
	Atterberg Limi	ts		
PL= 21	LL= 66	PI= 45		
	Coefficients			
D ₈₅ =	D ₆₀ =	D ₅₀ = D ₁₀ =		
D ₈₅ = D ₃₀ = C _u =	D ₁₅ = C _C =	חם=		
- u	Classification	,		
USCS= CH		HTO=A-7-6(48)		
	Remarks			
B-26	<u> </u>			
S-6				
<u></u> .				

Sample No.: S-6/B

Source of Sample:

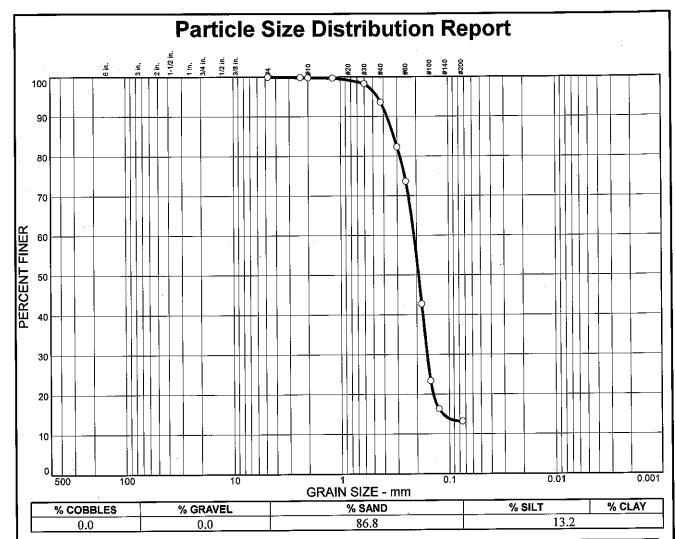
Date: 3-23-10 Elev./Depth: 11 to 12 feet

Location: B-27

Project: Roanoke Island Water System Improvements

Project No: EC09-249G

GET SOLUTIONS, INC.



1	SIEVE	PERCENT	SPEC.*	PASS?
	SIZE	FINER	PERCENT	(X=NO)
	#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 99.8 99.7 98.3 93.6 82.3 73.6 42.7 23.4 16.3 13.2		

Silty fine to med	Soil Description Silty fine to medium SAND (SM)			
PL=	Atterberg Limits	i. Pi=		
D ₈₅ = 0.322 D ₃₀ = 0.161 C _u =	Coefficients D ₆₀ = 0.211 D ₁₅ = 0.115 C _c =	D ₅₀ = 0.192 D ₁₀ =		
USCS=-SM	Classification AASH	FO=A-2-4(0)		
0000 0111	<u>Remarks</u>	· · · · · · · · · · · · · · · · ·		
B-28 S-3	·			

Sample No.: S-3 Location: B-28 Source of Sample:

Date: 3-23-10

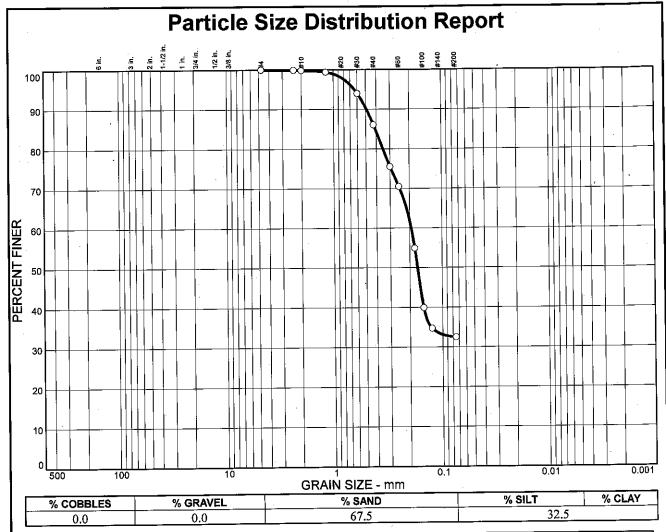
Elev./Depth: 4 to 6 feet

GET SOLUTIONS, INC.

Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G



	SIEVE	PERCENT	SPEC.*	PASS?
ł	SIZE	FINER	PERCENT	(X=NO)
	#4 #8 #10 #16 #30 #40 #50 #60 #80 #100 #120 #200	100.0 99.9 99.8 99.4 94.0 86.1 75.5 70.5 54.9 39.9 34.7 32.5		

Clayey fine to m	Soil Description Clayey fine to medium SAND (SC)					
PL=	Atterberg Limits LL=	PI=				
D ₈₅ = 0.409 D ₃₀ = C _u =	Coefficients D ₆₀ = 0.193 D ₁₅ = C _c =	D ₅₀ = 0.170 D ₁₀ =				
USGS=-SC	Classification AASHT	-O=A-2				
B-29 S-2	<u>Remarks</u>					

Sample No.: S-2/B Location: B-29

Source of Sample:

Date: 3-23-10

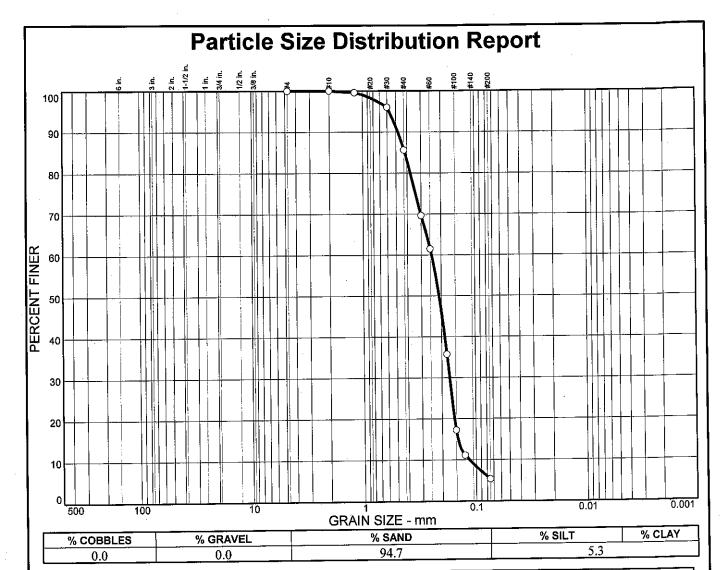
Elev./Depth: 3 to 4 feet

GET SOLUTIONS, INC. Client: CDM

Project: Roanoke Island Water System Improvements

Project No: EC09-249G

<u>Figure</u>



	SIEVE	PERCENT	SPEC.*	PASS?
	SIZE	FINER	PERCENT	(X=NO)
	#4 #10 #16 #30 #40 #50 #60 #80 #100 #120	100.0 100.0 99.6 96.0 85.6 69.6 61.5 35.7 17.2 11.1 5.3		
_				

Soil Description Poorly graded fine to medium SAND (SP-SM) with silt				
PL= NP	Atterberg Limits	PI= NP		
D ₈₅ = 0.419 D ₃₀ = 0.171 C _u = 2.11	Coefficients D60= 0.243 D15= 0.145 C _c = 1.04	D ₅₀ = 0.210 D ₁₀ = 0.115		
	Classification			
USCS= SP-SM	1 AASHI	O= A-3		
B-30 S-1	<u>Remarks</u>			

Sample No.: S-1

Source of Sample:

Date: 3-23-10

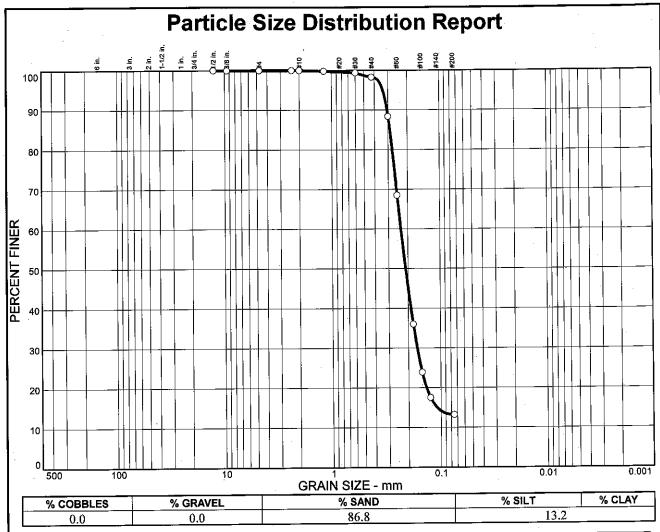
Location: B-30

Elev./Depth: 0.5 to 2 feet

GET SOLUTIONS, INC. Project No: EC09-249G

Client: CDM

Project: Roanoke Island Water System Improvements



ĺ	SIEVE	PERCENT	SPEC.*	PASS?
١	SIZE	FINER	PERCENT	(X=NO)
1	0.5 in.	100.0		
	0.375 in. #4	100.0 100.0		
1	#4 #8	100.0	ļ	
	#10	100.0		
	#16	99.8 99.4		
	#30 #40	99.4 98.3		
ļ	#50	88.4		
	#60	68.5 36.0		
	#80 #100	23.9		
	#120	17.5		
	#200	13.2		

Tan Silty fine to	Soil Description Tan Silty fine to medium SAND (SM) with trace organics					
PL=	Atterberg Limits	PI=				
D ₈₅ = 0.289 D ₃₀ = 0.166 C _u =	Coefficients D60= 0.232 D15= 0.109 Cc=	D ₅₀ = 0.211 D ₁₀ =				
USCS=-SM	Classification AASHT	-O=—A-2-4(0)				
HA-24 Proctor #2	<u>Remarks</u>					

Sample No.: Bulk Sample

Location: HA-24

Source of Sample:

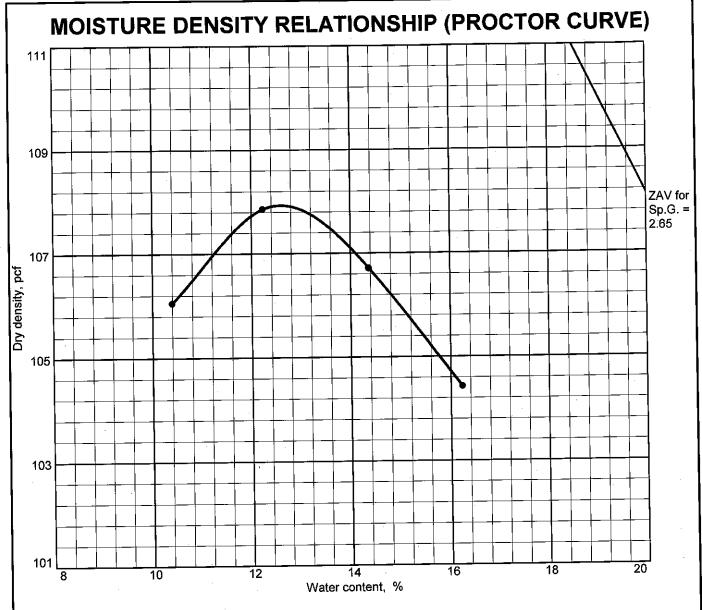
Date: 3/23/10

Elev./Depth: 0.5 to 1.5 feet

GET SOLUTIONS, INC.

Project: Roanoke Island Water System Improvements

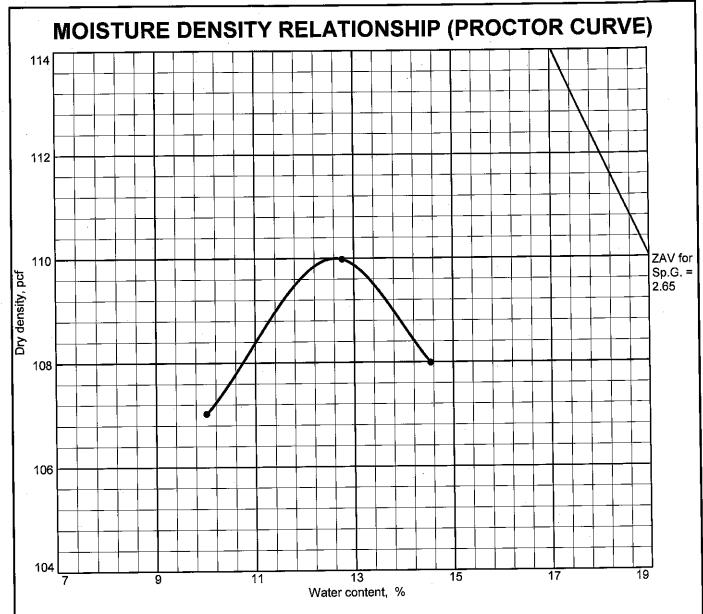
Project No: EC09-249G



Test specification: ASTM D 698-00a Method A Standard

Elev/	Class	ification	Nat.	Sp.G.	LL	PI	% >	% <
Depth	USCS	AASHTO	Moist.	J		ļ · · ·	No.4	No.200
0.5 to 2 feet	SP-SM	A-3	22.9		NP	NP	0.0	5.3

TEST RESULTS	MATERIAL DESCRIPTION			
Maximum dry density = 107.9 pcf	Poorly graded fine to medium SAND (SP-SM with silt			
Optimum moisture = 12.6 %				
Project No. EC09-249G Client: CDM	Remarks:			
Project: Roanoke Island Water System Improvements	B-30 Proctor No. 1			
• Location: B-30				
MOISTURE DENSITY RELATIONSHIP (PROCTOR CURVE)				
GET SOLUTIONS, INC.	Figure			



Test specification: ASTM D 698-00a Method A Standard

Elev/	Classification		Nat.	ication Nat.		11	PI	% >	% <
Depth	USCS	AASHTO	Moist.	Sp.G.	LL 	• •	No.4	No.200	
0.5 to 1.5 feet	SM	A-2-4(0)	12.7				0.0	13.2	

TEST RESULTS	MATERIAL DESCRIPTION		
Maximum dry density = 110.0 pcf	Tan Silty fine to medium SAND (SM) we trace organics		
Optimum moisture = 12.6 %			
Project No. EC09-249G Client: CDM	Remarks:		
Project: Roanoke Island Water System Improvements	HA-24 Proctor No. 2		
• Location: HA-24			
MOISTURE DENSITY RELATIONSHIP (PROCTOR CURVE)			
GET SOLUTIONS, INC.	Figure		