

**Preliminary Geotechnical
Engineering Study
Commonwealth Crossing
Business Center
U.S. 220 South of Ridgeway,
Henry County, Virginia**

Project 09160023

May 15, 2009

May 15, 2009

Mr. Tim Wagner, P.E.
Wiley & Wilson
127 Nationwide Drive
Lynchburg, Virginia 24502-4272

Subject: Project 09160023, Preliminary Geotechnical Engineering Study, Commonwealth Crossing Business Center, U.S. 220 South of Ridgeway, Henry County, Virginia

Dear Tim:

Schnabel Engineering, LLC (Schnabel), is pleased to submit our preliminary geotechnical report for this project. This document includes attached figures and appendices with relevant data collected for this study. We provided our services in accordance with the Standard Form of Agreement for this project between Wiley & Wilson and Schnabel Engineering dated December 11, 2008.

SCOPE

Our proposal, dated January 28, 2009, defines the scope of this study. Our services include subsurface exploration, field engineering, soil laboratory testing, and development of preliminary geotechnical engineering recommendations. The objective of this study is to evaluate the subsurface conditions and provide preliminary recommendations regarding the design of earthwork and foundations for this project.

Services not described in our agreement are not included in this study. We would be happy to provide additional support services to the design team as the project demands.

SITE DESCRIPTION

The project site is a rural property located immediately northwest of U.S. 220 and adjacent to the Virginia/North Carolina line in southern Henry County, Virginia. A Norfolk Southern rail line parallels the southeast property boundary along the southbound lanes of U.S. 220. White House Road marks the northeast extent of the property. Marrowbone Reservoir is situated north of the site. The site encompasses about 832 acres. Site topography is hilly with numerous ridges and

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intersecting valleys. Existing ground surface grades vary from about El 850 to El 990. Patterson Branch bisects the site and flows north into Marrowbone Reservoir. The site has recently been logged and surface vegetation at the time of our recent field exploration consisted of brush and small trees.

We obtained the site information from the topographic site plan and boring survey data provided by Henry County and through our site visits. A Vicinity Map is included as Figure 1.

PROPOSED CONSTRUCTION

Henry County owns the subject property and is interested in developing it as an industrial park and/or business center. Cut and fill depths of up to 65 ft and 110 ft, respectively, are anticipated to grade site roadways and individual building pads. Building construction could vary from light commercial to heavy industrial. Froehling & Robertson (F&R) drilled three borings at this site in 2007. Schnabel Engineering drilled eight additional borings in 2008.

SUBSURFACE CONDITIONS

Geology

The project site is located in the Blue Ridge physiographic province of Virginia. The Blue Ridge province is characterized by crystalline igneous and metamorphic rocks that range in age from about late Proterozoic to Cambrian. The metamorphic rocks include metamorphosed igneous and sedimentary rocks. The overall physiography of the Blue Ridge in southern Virginia is that of a broad upland plateau that trends in a northeast-southwest direction.

According to the Geologic Map of Virginia Portion of the Danville 30 x 60 Minute Quadrangle (Virginia Division of Mineral Resources, 1993) and information in our files, the site is underlain by rocks of the late Proterozoic to Cambrian age Alligator Back formation and the late Proterozoic Ashe Metamorphic Suite. These formations consist primarily of muscovite-biotite schist and gneiss with lesser amounts of hornblende schist and amphibolite. Pegmatite and alaskite dikes and sills are reported along the Ridgeway Fault, which is mapped immediately to the northwest of the study site.

Residual overburden materials in this geology typically consist of a mixture of sandy silt, silty sand, lean clay, and weathered or disintegrated rock. This description corresponds well to the materials encountered in the borings drilled for this study. The residual soils are derived from the chemical and physical weathering of the underlying bedrock. Disintegrated rock is a partially weathered gradational zone between the overlying residual soils and the underlying bedrock. Residual soil and disintegrated rock strata are commonly interbedded in this geology as was observed in several of the borings at this site.

Data Collection Techniques

We performed test borings and soil laboratory testing on samples collected to develop our preliminary geotechnical recommendations. Appendix A includes our summary of soil laboratory test results and laboratory test curves. Appendix B includes the logs from our recent subsurface

exploration as well as our 2008 subsurface exploration. We have also included three borings logs drilled by F&R in 2007.

Our geotechnical laboratory conducted tests on selected samples obtained in the borings. This testing aided in the classification of soils encountered in the subsurface exploration, and provided data for use in the development of foundation and earthwork recommendations. Laboratory tests included natural moisture content, gradation curves, Atterberg Limits and moisture-density relationships. The logs in Appendix B show the natural moisture content values of selected soil samples. Appendix A presents the results of the remaining laboratory tests.

Blue Ridge Drilling, Inc., Boones Mill, Virginia drilled twelve borings (B-12 through B-24) and one offset boring at this site under our observation between April 22 and 27, 2009. Previously, Soil Drilling Services, Charlotte, North Carolina drilled eight borings (B-1 through B-8) and two offset borings at this site under our observation on February 18, 2008. The F&R borings were drilled on August 8 and 9, 2007. Appendix B includes specific observations, remarks, and logs for the borings; classification criteria; and sampling protocols. Figure 2 shows the boring locations. Boring coordinates and elevations were surveyed by Henry County personnel and provided to us for our use. We will retain soil samples from Borings B-12 through B-24 up to 45 days beyond the issuance of this report, unless you request other disposition.

Generalized Subsurface Stratigraphy

We have characterized the following generalized subsurface soil stratigraphy based on the boring data presented in Appendix B:

Ground Cover:

Due to previous clear-cutting of the property and clearing of trails to the boring locations, no topsoil was present at the test boring locations. Our experience in this region indicates that topsoil thicknesses are generally in the 4 to 6-inch range. However, we anticipate that the top 6 to 8 inches below the ground surface generally contains abundant roots, stumps, and topsoil-contaminated soil.

Stratum F: Existing Fill

We encountered soft consistency existing fill in Borings B-22 and B-24 from the ground surface to depths of 3.0 to 4.0 ft. The existing fill was composed primarily of silt and elastic silt soils. These soils contained varying amounts of sand, along with some organic matter, glass, and mica. Standard Penetration Test N-values in Stratum F averaged 3. We believe these fill soils are associated with localized residential and/or farming activities.

Stratum A: Alluvial

We did not encounter alluvial soils in any of the borings we drilled. However, we expect that alluvial soils are present in and around the bottoms of stream valleys. Typically, alluvial soils in this geology are relatively thin strata consisting of silts, clays, and sands.

Stratum B: Residual

We encountered medium stiff to very stiff consistency residual ELASTIC SILT (MH), SILT (ML), and LEAN CLAY (CL) in most of the borings from the ground surface to depths of about 3.5 ft to 8.5 ft. Beneath these near-surface fine-grained soils, and interbedded with Stratum C disintegrated rock, we encountered loose to compact density residual SANDY SILT (ML), SILTY SAND (SM), POORLY GRADED SAND (SP), and POORLY GRADED SAND WITH SILT (SP-SM) soils to depths of 6.0 to 50.0 ft. Stratum B soils typically contained mica. Residual soils are derived from the physical and chemical weathering of the underlying bedrock. Standard Penetration Test N-values ranged from 6 to 54 in this stratum.

Stratum C: Disintegrated Rock

We encountered very compact density disintegrated rock in most borings beneath and interbedded with Stratum B soils to depths of 8.0 ft to 61.4 ft. These partially weathered rock materials represent a weathered gradational zone between the overlying residual soils and the underlying bedrock. N-values in Stratum C ranged from 62 to 100/3”.

Disintegrated rock is defined by Schnabel Engineering as residual material with N values equal to or greater than 60 blows per foot and less than 100 blows for 2 inches of penetration. Equivalent penetration resistance of 100 blows or more per 2 inches is designated as sampler refusal. We recorded sampler refusal in Boring B-1, B-20, and B-22 at depths ranging from 13.6 ft to 28.5 ft. We recorded auger refusal in Borings B-1, B-2, B-6, B-8, B-20, B-21, B-22, and B-23 at depths ranging from 5.9 ft to 61.4 ft. Due to shallow refusal, we offset Borings B-1, B-6, and B-23 and resumed drilling. In offset Boring B-1A, we recorded auger refusal at a depth of 19.4 ft, compared to auger refusal at 15.0 ft in Boring B-1. In offset Boring B-6A, we recorded auger refusal at a depth of 47.5 ft, compared to auger refusal at 5.9 ft in Boring B-6. In offset Boring B-23A (40 ft east of B-23), we did not encounter auger refusal to a depth of 34.0 ft, compared to auger refusal at 8.0 ft in Boring B-23. Large variations in refusal depths over short distances are not uncommon in this geology due to the presence of igneous rock intrusions or dikes. These features are typically harder than the surrounding strata and tend to weather at a slower rate.

Groundwater

We encountered groundwater during drilling and upon completion in Borings B-13 (53.5 ft; Elevation 896 ft) and B-16 (48.0 ft; Elevation 892 ft). In our previous study, groundwater was not encountered in any of the eight test borings. These dry conditions may or may not represent the stabilized groundwater levels at the site. Borings were backfilled upon completion for safety. The final design should anticipate fluctuations in the hydrostatic water table depending on variations in precipitation, surface runoff, evaporation, stream levels, and similar factors. Also, perched groundwater can occur in these geologic conditions as the downward migration of surface water is retarded by very compact layers of disintegrated rock.

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

We based our geotechnical engineering analysis on the information developed from our previous and current subsurface exploration, soil laboratory testing, along with our general assumptions regarding site development. The following sections of the report provide our detailed recommendations.

Earthwork and Grading

Our primary concern related to site development is site grading. Based on the master plan of the site, cuts of up to 65 ft and fills of 110 ft may be required to grade site roadways and building pads. Excavation depths and compacted structural fill heights of this magnitude are relatively common in this part of Virginia due to the large variations in topographic relief in most areas. Site excavation in the transitional residual profile can present difficulties to a grading contractor. These difficulties are often reflected in contract administration and the cost of site preparation. Also a concern is cut slope stability in the residual soils. Flatter slopes required for long term stability can consume valuable land area. In order to facilitate the design and implementation of grading at this site, it will be important to carefully consider subgrade preparation, subdrainage, compacted structural fill placement, cut and fill slopes, settlement monitoring, and rock excavation.

Subgrade Preparation

The contractor should strip vegetation, topsoil, and organic matter from subgrades to receive compacted structural fill for building and pavement support. At the test boring locations, surface material was cleared in the process of providing access. Consequently, no topsoil was present in the borings. We anticipate that an average of about 4 or 6 inches of topsoil and root mat may be encountered across the site. Stripping and grubbing of previously wooded sites typically result in some disturbance and contamination of near-surface soils, particularly during periods of wet weather. Therefore, we recommend a topsoil stripping depth of at least 8 inches for project planning.

Two test borings encountered soft existing fill soils to depths of about 4 ft below the ground surface. We anticipate the extent of these fill soils is probably limited but, where encountered, they should be undercut and replaced with compacted structural fill. We anticipate soft residual and/or alluvial soils are present in other areas of the site, particularly in the valleys. A previous test boring (B-2, F&R) located in a topographically low area near the center of the property, encountered some soft and wet soils near the ground surface. We anticipate that these soft near-surface soils may be unsuitable for support of the compacted structural fill. Where unsuitable soils are encountered, they should be undercut to expose suitable subgrade soils. The geotechnical engineer should evaluate the subgrade soils for suitability based on observations of proofrolling with a loaded dump truck or scraper. Areas that exhibit excessive pumping, weaving, or rutting, should be undercut and replaced with additional compacted structural fill.

Subdrainage

We anticipate that seeps and springs may exist in some locations, particularly during wet weather periods. Containing and transporting groundwater flow beneath embankment fills will be an important consideration during the development of this site and should be anticipated. We expect

that subdrainage beneath embankment fills can be accomplished using trench drains. Specific details regarding subdrainage design and installation should be addressed in the final geotechnical engineering study.

Compacted Structural Fill

We anticipate that the non-organic portions of material excavated from cut areas of the site should generally be suitable for re-use as compacted structural fill. The use of these materials as compacted structural fill will depend on the soil moisture content, and the contractor's ability to limit contamination of these materials with organic matter during stripping and undercutting.

Compacted structural fill should consist of material classifying MH, CL, ML, SC, SM, SP, SW, GC, GM, GP, or GW per ASTM D2487. Non-organic, on-site soils are generally expected to meet this criterion. Rock larger than about 3 inches encountered during excavation should either be spoiled outside the fill areas or incorporated into non-structural areas of the fill embankment. If the volume of rock encountered during excavation is large, then rock fills may be necessary. Rock fills, if used, should be confined to the lower portions of deep fill embankments and preferably beyond the limits of buildings. In general, we expect that a maximum rock fill lift thickness of about 2 ft with a maximum rock size of 18 inches should be acceptable. Rock fill should be placed in carefully controlled lifts with respect to thickness and compactive effort.

Successful reuse of the excavated, on-site soils as compacted structural fill will depend on their natural moisture contents at the time of excavation. Natural moisture content values of the upper fine grained Stratum B soils (MH, ML, CL) ranged from 23.3 percent to 39.3 percent, with an average of about 30 percent. Natural moisture content values of the lower coarse grained Stratum B soils (SM, ML, SP, SP-SM) ranged from 4.5 percent to 22.6 percent, with an average of about 14 percent. Based upon the laboratory proctor results, the natural moisture contents of the upper Stratum B soils tested are typically above the probable optimum moisture content for compaction. The natural moisture contents of the lower Stratum B soils tested are typically at or below the probable optimum moisture content for compaction. Moisture conditioning (drying and/or wetting) of the excavated soils will likely be required prior to their use as compacted structural fill and should be anticipated.

Compacted structural fill should be placed in maximum 8-inch thick horizontal, loose lifts and should be compacted to at least 95 percent of maximum dry density per ASTM D698, Standard Proctor. The contractor should bench compacted structural fill subgrades steeper than 4H:1V to allow placement of horizontal lifts and to tie lifts into the adjacent ground. Compacted structural fill should extend laterally at least 20 ft beyond the building limits and 10 ft beyond pavement limits, and then slope as needed to meet existing grades.

Cut and Fill Slopes

The on-site soils generally consist of micaceous silts and sands that are susceptible to erosion. Consequently, we recommend that excavated cut slopes and compacted structural fill slopes be designed and constructed no steeper than 2.5H:1V. If benches are incorporated into the slopes, then slopes between benches may be as steep as 2H:1V provided the effective total slope angle from toe

to crest is not steeper than 2.5H:1V. Storm water runoff at the top of cut and fill slopes should be diverted to prevent the flow of water over the slopes and the subsequent soil erosion.

Settlement Monitoring

The on-site soils generally consist of coarse-grained non-plastic sands and low plasticity silts. These soil types are not considered susceptible to significant long-term consolidation settlements. Consequently, a majority of the subgrade and fill settlement should occur during and shortly after placement. However, for buildings and pavements on fill embankments deeper than about 30 ft, we recommend that settlement of the fill surface be monitored prior to foundation and pavement construction. Settlement points should be surveyed twice weekly. Construction on the fill should not begin until, in the opinion of the geotechnical engineer, the settlement has essentially ceased. We anticipate that in the deepest fill areas, a waiting period on the order of eight to twelve weeks should be adequate. To avoid the delay associated with settlement monitoring and to facilitate construction, buildings should be situated so that they are either in cut or underlain by less than 30 ft of fill.

Rock Excavation

Some rock excavation will probably be required to grade the site. In general, material that is hard enough to result in auger refusal in test borings will require rock excavation. Based on the test boring data and our experience in this geology, we anticipate that rock excavation will primarily consist of the removal of igneous rock intrusions or dikes that may be randomly scattered throughout the site. In some cases, these dikes of rock are surrounded by soil and can be removed without using rock excavation techniques after the soil has been excavated. In any event, rock should be defined in the project specifications. A sample definition of rock for excavation specifications is provided below:

For mass excavation, rock is defined as any material that cannot be dislodged by a Caterpillar Model No. D-8 heavy-duty tractor, or equivalent, equipped with a hydraulically operated, single-tooth power ripper without the use of hoe-ramming or blasting. For trench, footing and pit excavations, rock excavation shall be defined in terms of a Caterpillar Model No. 330 hydraulic excavator, or equivalent. This classification does not include material such as loose rock, concrete, cemented gravel, or other materials that can be removed by means other than hoe-ramming or blasting, but which for reasons of economy in excavating, the contractor chooses to remove by hoe-ramming or blasting. Rock does not include boulders less than one cubic yard in volume. Boulders larger than one cubic yard in volume will be considered rock for payment purposes.

Where the rock cannot be removed with conventional excavation equipment, special means of excavation may be necessary. Removal of this rock may require the use of blasting, air-powered tools, rock splitters, large hoe rams, or rippers. Additional work may be required to reduce the excavated materials down to a size suitable for use as compacted structural fill.

Preliminary Foundation Recommendations

For general building support, we anticipate that shallow spread footings supported on suitable natural residual soils and disintegrated rock of Strata B and C, or on properly placed compacted structural fill will be an appropriate foundation alternative for buildings constructed at this site. We anticipate an allowable soil bearing pressure in the range of 2,000 psf to 3,000 psf will be appropriate for shallow spread footings bearing on Stratum B soils. Even higher allowable bearing pressures on the order of 4,000 to 6,000 psf may be feasible for foundations bearing directly on disintegrated rock of Stratum C. For footings bearing on properly placed compacted structural fill, an allowable soil bearing pressure of 3,000 psf should be considered.

For foundations requiring higher allowable bearing pressures, we anticipate that some form of ground improvement may be required prior to foundation construction where soil subgrades are present. Partial undercut of soils and replacement with dense aggregate stone (VDOT No. 21A) compacted to modified proctor density is one alternative for increasing the allowable bearing capacity. Another option is ground improvement using rammed aggregate piers.

Minimum widths of 18 and 24 inches should be maintained for wall and column footings, respectively, for shear considerations. Interior footing grades may be set at nominal depths below the floor slab. Exterior footings, or those which may be exposed to climate variation, should be founded below a depth of 24 inches for frost considerations.

Differential Settlement Potential

Due to the natural topographic relief at this site, differential settlement may be a potential problem. Following site grading, portions of the building pads and roadways may be in rock cut or shallow soil areas and portions may be in deep fill areas. While very little settlement would be expected in rock cuts or shallow soil areas, fill and subgrade settlements in deep fill areas could be significant.

In order to avoid excessive differential settlements between adjacent footings founded on soil and rock, it may be necessary in some cases to provide a compacted soil cushion between the bottom of footings and the rock surface. The need for soil cushions should be evaluated during the final studies for individual project sites when final footing elevations and configurations are known.

Seismic Site Classification

We have performed a preliminary assessment of the probable Seismic Site Class for this site according to IBC Section 1613.5.5 (2006). For buildings whose foundations bear directly on disintegrated rock or compacted structural fill and Stratum B soils totaling less than about 10 ft thick, we anticipate that a Site Class C should be appropriate. For buildings situated on soils deeper than about 10 ft, we anticipate that a Site Class D will be appropriate. The selection of Seismic Site Class should be evaluated in more detail during geotechnical engineering studies for individual buildings.

Floor Slabs

We anticipate that the natural residual soils of Stratum B, and the disintegrated rock of Stratum C should generally be suitable for floor slab support. Floor slabs may also be supported on properly placed compacted structural fill. The suitability of floor slab subgrades should be evaluated at the time of construction by the geotechnical engineer. A modulus of subgrade reaction, k , in the range of 100 to 200 pci should be appropriate for the soils and disintegrated rock at this site.

Scope for Final Geotechnical Engineering Study

The discussion of preliminary earthwork, foundation, and floor slab recommendations presented herein is intended only to give a generalized assessment of the area and is not intended for final design. Prior to design and construction at this site, a final geotechnical engineering study should be performed to better define the site stratigraphy and groundwater conditions, and to determine specific earthwork, foundation, floor slab, seismic, and pavement design requirements for the design loads, grades, and traffic volumes. The final study should include sufficient additional test borings and laboratory testing to adequately define the subsurface conditions and groundwater levels within the area of the proposed development.

LIMITATIONS

We based our preliminary analyses and recommendations submitted in this report on the information revealed by our exploration. We attempted to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during the final geotechnical engineering study and during construction.

We prepared this report to aid in the preliminary evaluation of this site. We intend it for use concerning this specific project. We based our recommendations on information on the site and anticipated construction as described in this report. We would appreciate the opportunity to provide a final geotechnical engineering studies for individual building sites and roadways as the project moves forward.

We have endeavored to complete the services identified herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended, and no warranty or guarantee is included or intended in this report, or any other instrument of service.

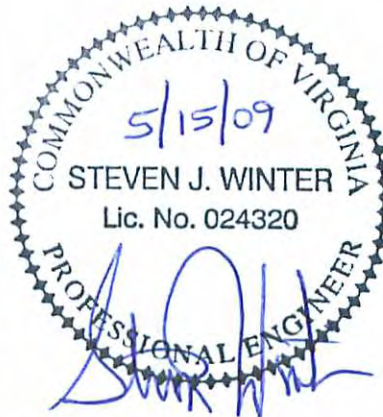
We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Very truly yours,

SCHNABEL ENGINEERING, LLC



Thomas T. Moore, E.I.T.
Senior Staff Engineer



Steven J. Winter, P.E.
Senior Associate

SJW:SEC:rl

Figures

Appendix A: Soil Laboratory Test Data

Appendix B: Subsurface Exploration Data

Distribution:

Wiley & Wilson (Two Copies)

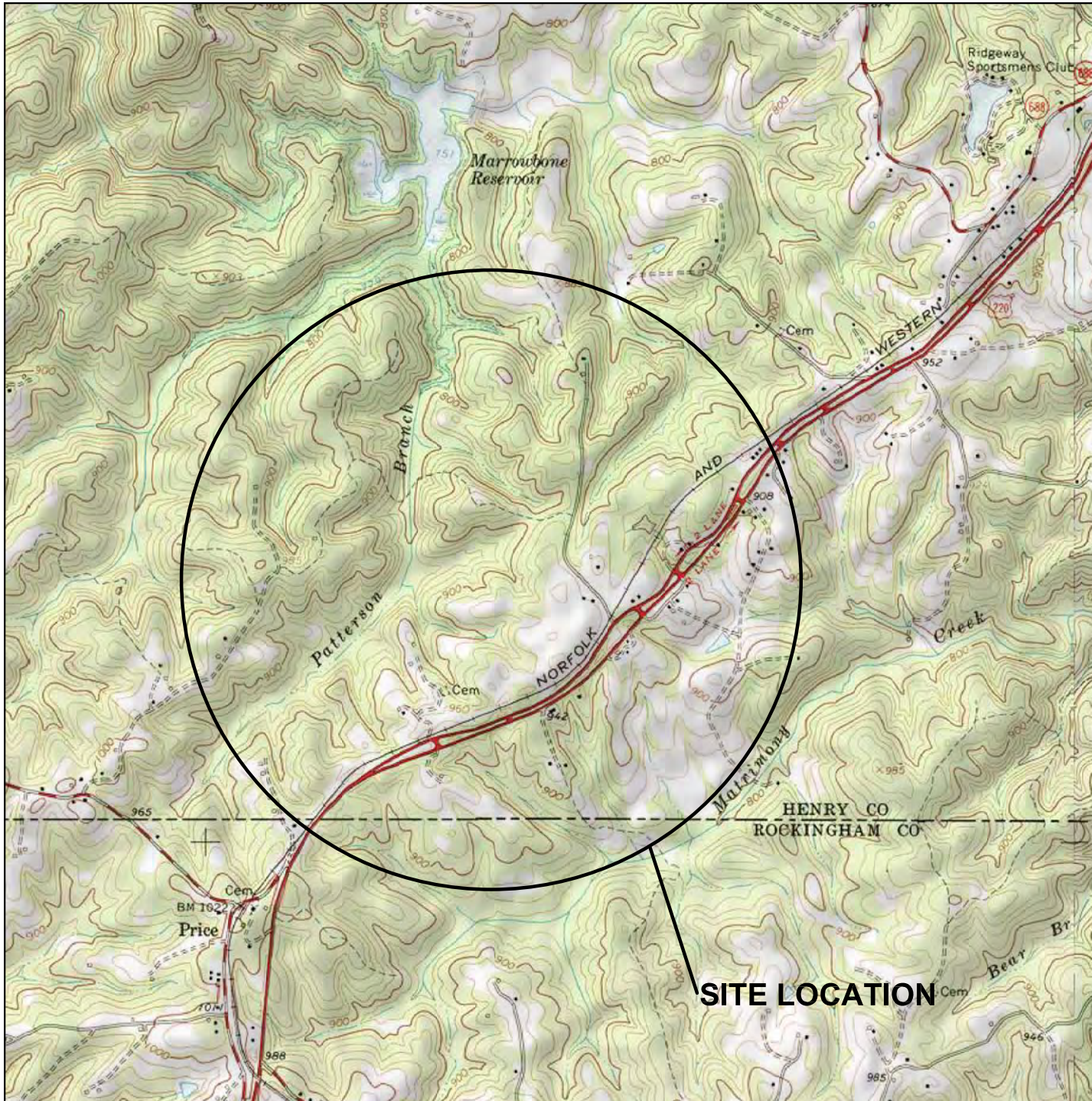
Attn: Tim Wagner, P.E.

127 Nationwide Drive

Lynchburg, Virginia 24502-4272

FIGURES

Vicinity Map, Figure 1
Test Boring Location Plan, Figure 2



VICINITY MAP

FIGURE 1

SCALE: 1"=2000'

CONTRACT 09160023
 COMMONWEALTH BUSINESS
 CENTER, U.S. ROUTE 220
 SOUTH OF RIDGEWAY,
 HENRY COUNTY, VIRGINIA



SOURCE:

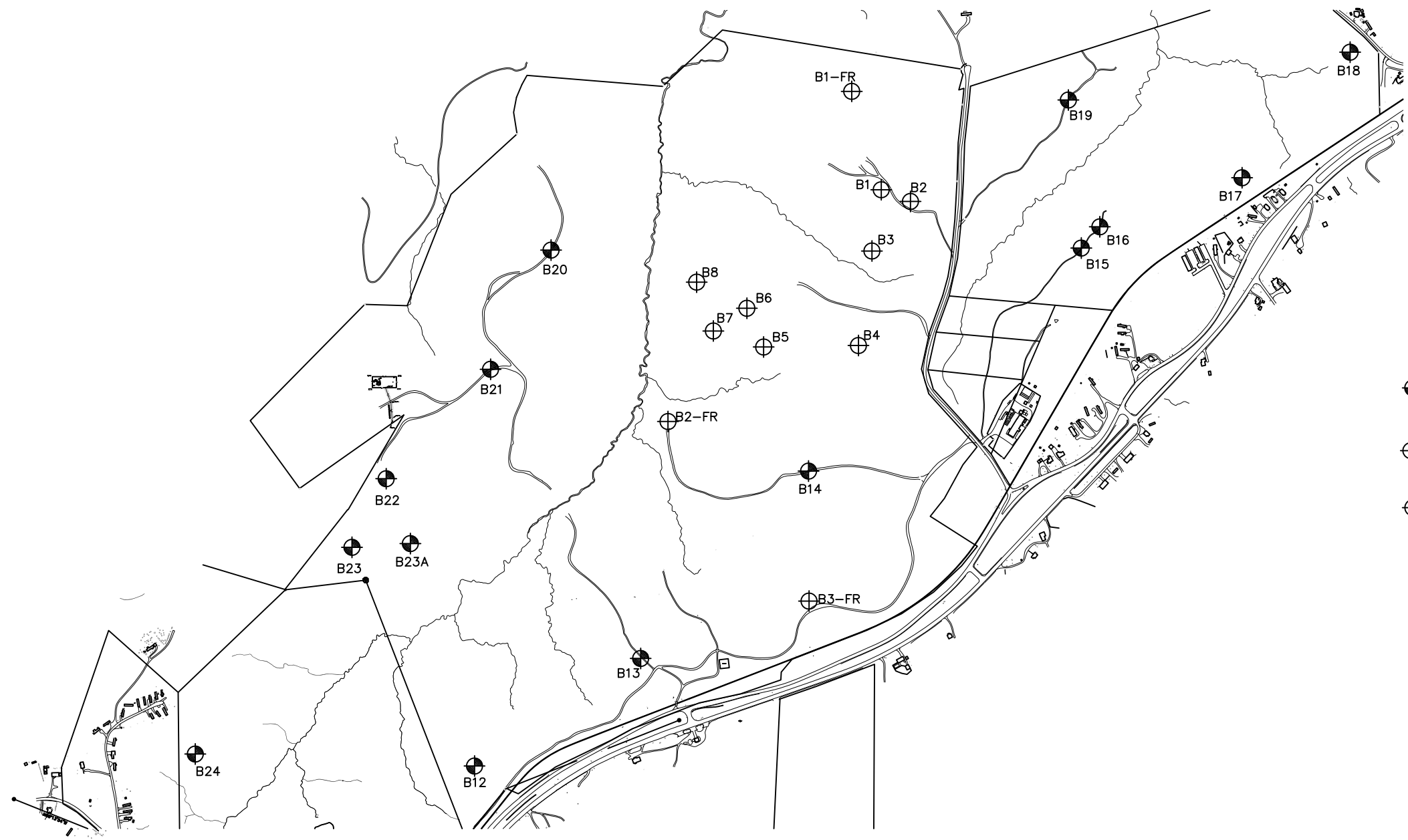
NATIONAL GEOGRAPHIC
 USGS TOPOGRAPHIC MAPS
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ALL LOCATIONS ARE
 APPROXIMATE






1901 SOUTH MAIN STREET
 SUITE 11
 BLACKSBURG, VA 24060-6613
 PHONE: 540-953-1239
 FAX: 540-953-3863

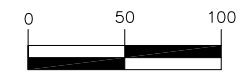
SITE LOCATION



LEGEND

-  B17 TEST BORING NUMBER AND LOCATION
-  B1 TEST BORING NUMBER AND LOCATION FROM PREVIOUS STUDY BY SCHNABEL ENGINEERING SOUTH, LLC
-  B2-FR TEST BORING NUMBER AND LOCATION FROM PREVIOUS STUDY BY F&R


GRAPHIC SCALE



1 inch = 100 ft.



REFERENCE: Henry County, VA provided the base plan for this drawing.

	COMMONWEALTH CROSSING BUSINESS CENTER HENRY COUNTY, VA		DRAWN BY: JAS	DATE: 05/09	TEST BORING LOCATION PLAN
			CHECKED BY: TM/SJW	SCALE: AS SHOWN	PROJECT 09160023 FIGURE 2

APPENDIX A

Soil Laboratory Test Data

Summary of Soil Laboratory Tests (1)
 Gradation Curves (3)
 Moisture Density Relationship (3)

Summary Of Laboratory Tests

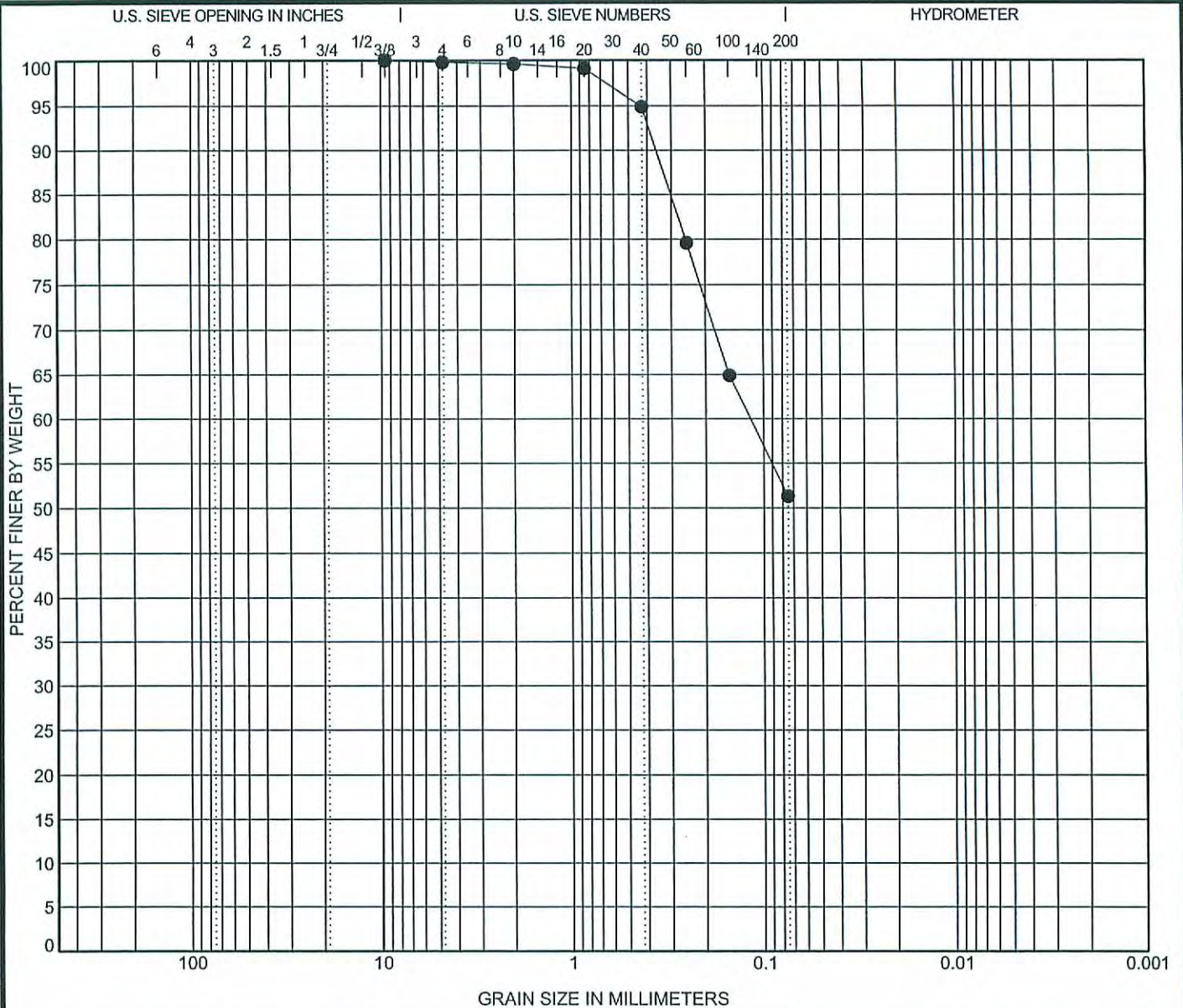
Appendix
 Sheet 1 of 1
 Project Number: 09160023

Boring No.	Sample Depth ft	Sample Type	Description of Soil Specimen	% Passing No. 200 Sieve	% Retained No. 4 Sieve	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Proctor Test Method
	Elevation ft										
B-15	0.0-1.5	Bulk	SANDY SILT (ML), contains mica - orange brown	51.3	0.2	NP	NP	NP	99.3	19.0	698A
	951.7-950.2										
B-19	0.0-1.5	Bulk	SILTY SAND (SM), fine to medium, contains mica - brown	43.7	0.0	NP	NP	NP	91.1	24.7	698A
	900.0-898.5										
B-21	10.0	Bulk	SANDY SILT (ML), contains mica - red brown	51.8	0.8	49	34	15	106.2	17.9	698A
	971.0										

- Notes:
1. Soil tests in general accordance with ASTM standards.
 2. Soil classifications are in general accordance with ASTM D2487(as applicable), based on testing indicated and visual classification.
 3. Key to abbreviations: NP=Non-Plastic; -- indicates no test performed



Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, VA



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen	Sample Description					LL	PL	PI		
B-15	0.0 ft	SANDY SILT (ML), contains mica - orange brown					NP	NP	NP	
Test Method	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
ASTM D422	9.5	0.117			0.2	48.5	51.3			

Percent Finer

Sieve Size	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/8 in.
% Finer	51.3	64.9	79.6	94.9	99.1	99.6	99.8	100.0

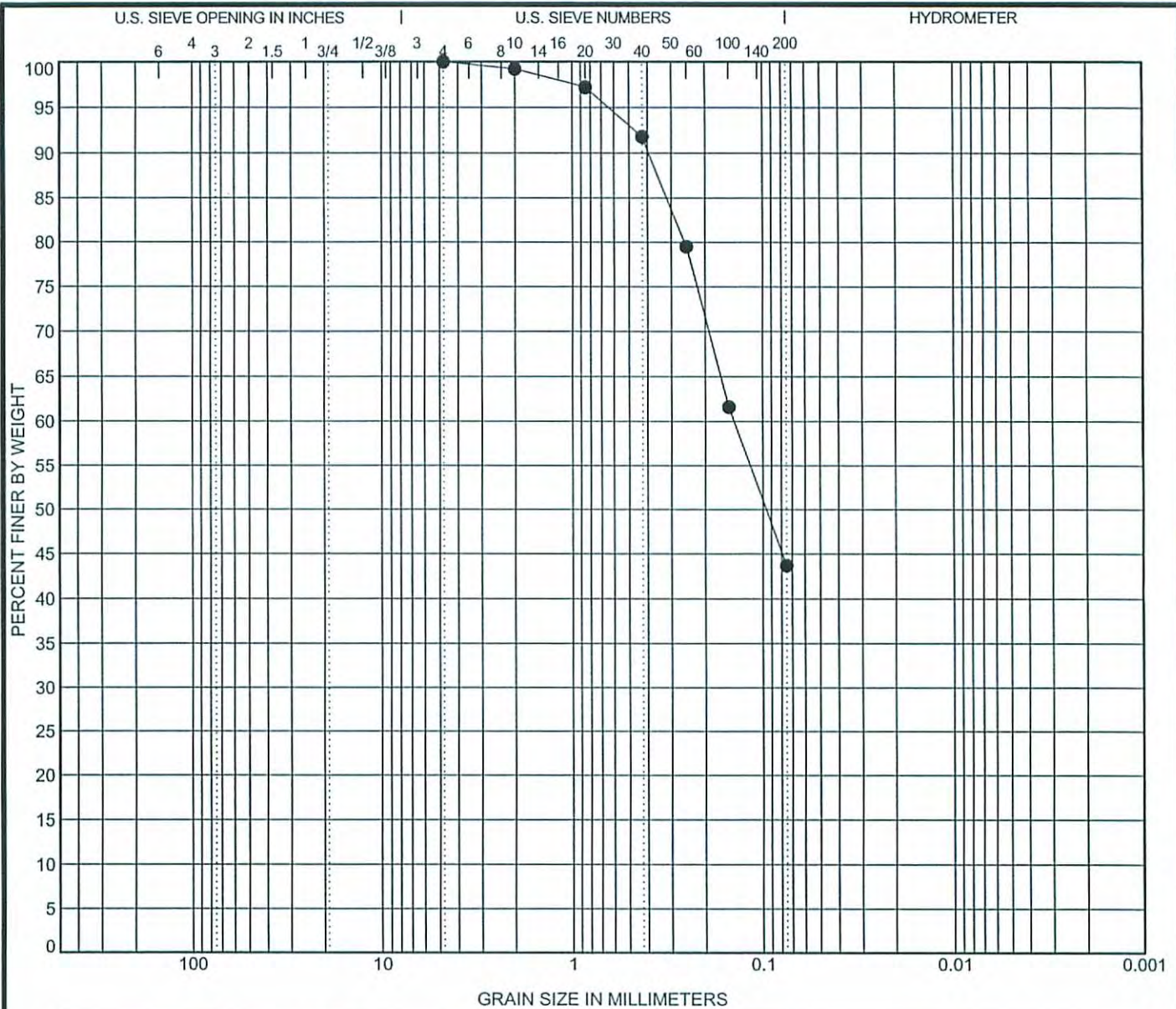
Tested By	Tested Date	Reviewed By	Calc By
MJF	4/27/09	TTM	MJF



GRADATION CURVE

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, VA
Contract: 09160023

SIEVE 1/SHEET_09160023.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 5/14/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen	Sample Description	LL	PL	PI				
B-19 0.0 ft	SILTY SAND (SM), fine to medium, contains mica - brown	NP	NP	NP				
Test Method	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
ASTM D422	4.75	0.141			0.0	56.3	43.7	

Percent Finer

Sieve Size	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4
% Finer	43.7	61.6	79.5	91.8	97.2	99.2	100.0

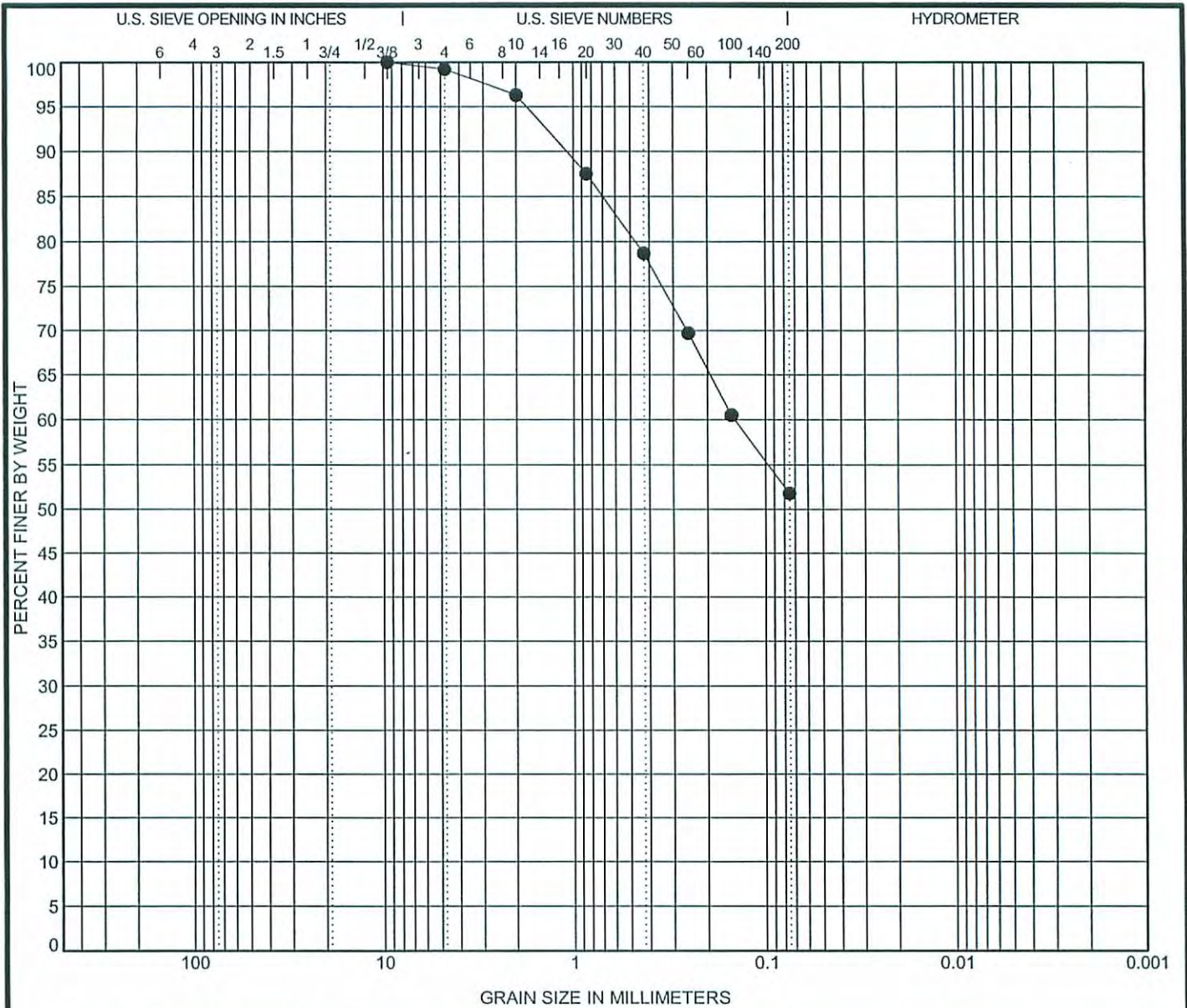
Tested By	Tested Date	Reviewed By	Calc By
MJF	4/27/09	TTM	MJF



GRADATION CURVE

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, VA
Contract: 09160023

SIEVE 1/SHEET_09160023.GPJ_SCHNABEL DATA TEMPLATE 2008_04_22.GDT 5/14/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen	Sample Description					LL	PL	PI			
B-21	10.0 ft	SANDY SILT (ML), contains mica - red brown					49	34	15		
Test Method	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay			
ASTM D422	9.5	0.144			0.8	47.4	51.8				

Percent Finer								
Sieve Size	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/8 in.
% Finer	51.8	60.5	69.7	78.7	87.5	96.3	99.2	100.0

Tested By	Tested Date	Reviewed By	Calc By
MJF	4/27/09	TTM	

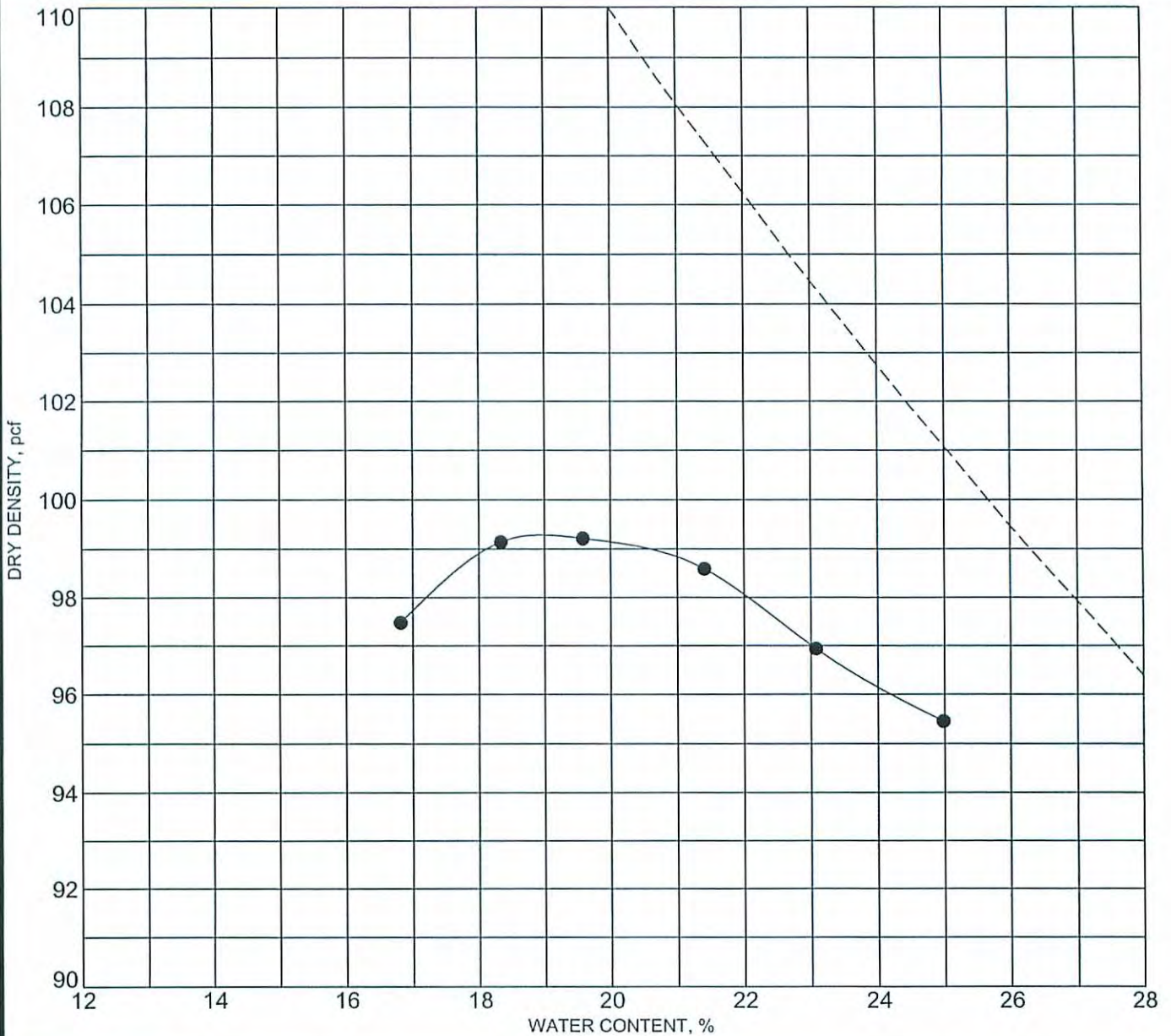


GRADATION CURVE

Project: Commonwealth Crossing Business Center
U.S. Route 220 South, Henry County
Martinsville, VA

Contract: 09160023

SIEVE 1/SHEET 09160023.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 5/14/09



Sample Description: SANDY SILT (ML), contains mica - orange brown

Sample Source: B-15, 0.0 ft

Test Methods: ASTM D698 Method A

Assumed Specific Gravity: 2.72

Max. Dry Density (pcf): 99.3

Opt. Moisture (%): 19.0

Liquid Limit (LL): NP

Plasticity Index (PI): NP

% Retained #4 Sieve: 0.2

% Passing # 200 Sieve: 51.3

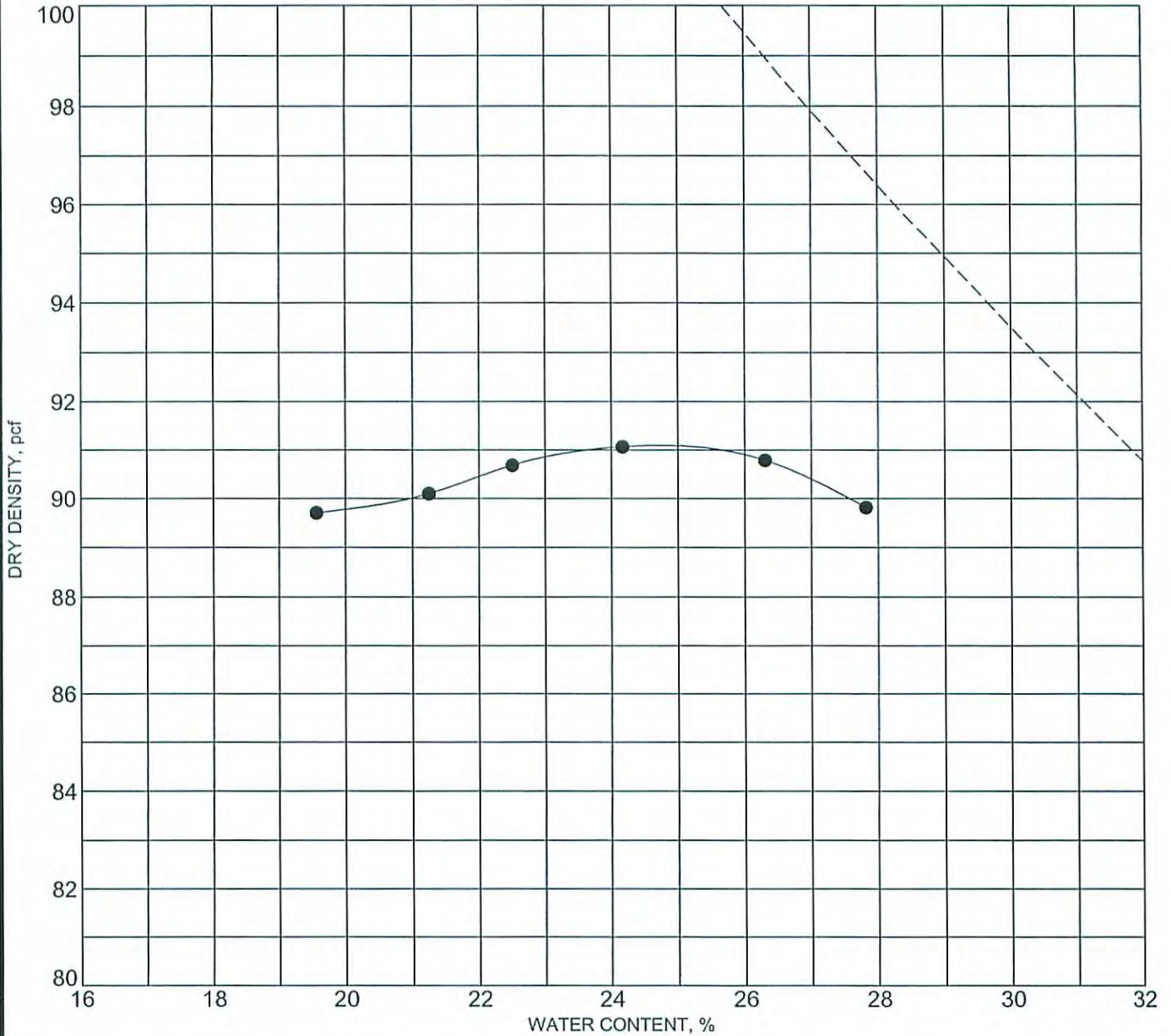
Comments:



MOISTURE DENSITY RELATIONSHIP

Project: Commonwealth Crossing Business Center
U.S. Route 220 South, Henry County
Martinsville, VA

Contract: 09160023



Sample Description: SILTY SAND (SM), fine to medium, contains mica - brown

Assumed Specific Gravity: 2.72

Max. Dry Density (pcf): 91.1

Opt. Moisture (%): 24.7

Sample Source: B-19, 0.0 ft

Test Methods: ASTM D698 Method A

Liquid Limit (LL): NP

Comments:

Plasticity Index (PI): NP

% Retained #4 Sieve: 0.0

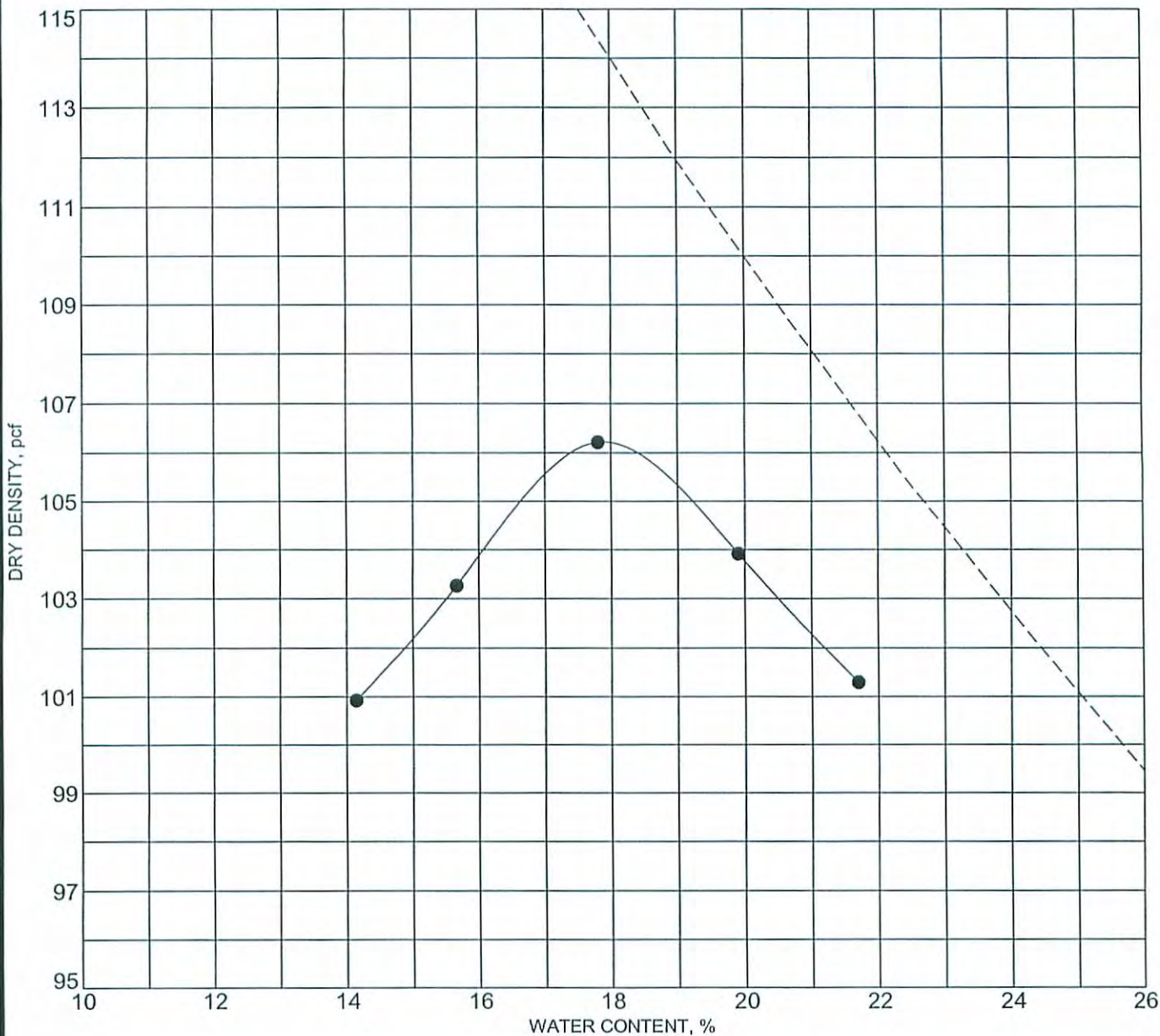
% Passing # 200 Sieve: 43.7

MOISTURE DENSITY RELATIONSHIP



Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, VA

Contract: 09160023



Sample Description: SANDY SILT (ML), contains mica - red brown

Sample Source: B-21, 10.0 ft
 Test Methods: ASTM D698 Method A

Assumed Specific Gravity: 2.72
 Max. Dry Density (pcf): 106.2
 Opt. Moisture (%): 17.9

Liquid Limit (LL): 49
 Plasticity Index (PI): 15
 % Retained #4 Sieve: 0.8
 % Passing # 200 Sieve: 51.8

Comments:



MOISTURE DENSITY RELATIONSHIP

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, VA
 Contract: 09160023

APPENDIX B

Subsurface Exploration Data

Subsurface Exploration Procedures
General Notes for Test Boring Logs
Identification of Soil
Boring Logs, B-1 through B-8 – February 2008
Boring Logs, B-11 through B-24 – April 2009
Boring Logs, B1-FR through B3-FR – August 2007

SUBSURFACE EXPLORATION PROCEDURES

Boring Procedures

Drillers advanced the borings using hollow-stem augers. At the designated depth, drillers performed the Standard Penetration Test. Water or drilling fluid was not introduced into the boring using this procedure. The logs indicate water level data.

Standard Penetration Test Results

The numbers in the Sampling Data column of the boring logs represent Standard Penetration Test (SPT) results. Each number represents the blows needed to drive a 2-inch O.D., 1 $\frac{3}{8}$ inch I.D. split-spoon sampler six inches, using a 140-pound hammer falling 30 inches. The sampler is typically driven a total of 18 or 24 inches. The first 6-inch interval usually represents a seating interval. The total of the number of blows for the second and third six-inch intervals is the SPT "N value." When the blow count reaches 100 before the full driving distance, we determine the SPT N value based on extrapolation of the blows recorded. The SPT is conducted according to ASTM D1586.

Soil Classification Criteria

The group symbols on the logs represent the Unified Soil Classification System Group Symbols (ASTM D2487) based on visual observation and limited laboratory testing of the samples. Criteria for visual identification of soil samples are included in this appendix. Some variation may be expected between samples visually classified and samples classified in the laboratory.

Disintegrated rock is residual material with SPT N values between 60 blows per foot and refusal. Refusal is a penetration rate of 100 blows per two inches or less penetration.

Boring Locations and Elevations

Boring locations were staked in the field by Henry County personnel. We drilled the borings at the staked locations. Boring locations and elevations included in this report were provided by Henry County.

SCHNABEL ENGINEERING
GENERAL NOTES FOR SUBSURFACE EXPLORATION LOGS

1. Numbers in sampling data column next to Standard Penetration Test (SPT) symbols indicate blows required to drive a 2 inch O.D., 1-3/8 inch I.D. sampling spoon 6 inches using a 140 pound hammer falling 30 inches. The Standard Penetration Test (SPT) N value is the number of blows required to drive the sampler 12 inches, after a 6 inch seating interval. The Standard Penetration Test is performed in general accordance with ASTM-1586.
2. Visual classification of soil is in accordance with terminology set forth in "Identification of Soil." The ASTM D-2487 group symbols (e.g. CL) shown in the classification column are based on visual observations.
3. Estimated ground water levels indicated on the logs are only estimates from available data and may vary with precipitation, porosity of the soil, site topography, and other factors.
4. Refusal at the surface of rock, boulder, or other obstruction is defined as an SPT resistance of 100 blows for 2 inches or less of penetration.
5. The logs and related information depict subsurface conditions only at the specific locations and at the particular time when drilled or excavated. Soil conditions at other locations may differ from conditions occurring at these locations. Also, the passage of time may result in a change in the subsurface soil and ground water conditions at the subsurface exploration location.
6. The stratification lines represent the approximate boundary between soil and rock types as obtained from the subsurface exploration. Some variation may also be expected vertically between samples taken. The soil profile, water level observations and penetration resistances presented on these logs have been made with reasonable care and accuracy and must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.
7. Key to symbols and abbreviations:



S-1, SPT - Sample No., Standard Penetration Test
 5+10+1 - Number of blows in each 6-in increment



UD-1, UNDIST - Sample No., 2" or 3" Undisturbed Tube Sample
 REC=24", 100% - Recovery in inches, Percent Recovery



C-1, CORE - Core No., Rock Core
 Run = 5.0 ft - Run Length in feet
 REC = 60" 100% - Recovery in inches, Percent Recovery
 RQD = 60" 100% - RQD in inches, Percent RQD

MC - Moisture Content

PP - Pocket Penetrometer Reading (tsf)

FID - Flame Ionization Detector Reading (ppm)

PID - Photoionization Detector Reading (ppm)

GP - Geostick Penetration Reading (inches)

LL - Liquid Limit

PL - Plastic Limit

TPH - Total Petroleum Hydrocarbons

SCHNABEL ENGINEERING

IDENTIFICATION OF SOILS

I. DEFINITION OF SOIL GROUP NAMES (ASTM D-2487)

SYMBOL GROUP NAME

Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels – More than 50% of coarse fraction retained on No. 4 sieve Coarse, ¾" to 3" Fine, No. 4 to ¾"	Clean Gravels Less than 5% fines	GW	WELL GRADED GRAVEL
			GP	POORLY GRADED GRAVEL
		Gravels with fines More than 12% fines	GM	SILTY GRAVEL
		GC	CLAYEY GRAVEL	
	Sands – 50% or more of coarse Fraction passes No. 4 sieve Coarse, No. 10 to No. 4 Medium, No. 40 to No. 10 Fine, No. 200 to No. 40	Clean Sands Less than 5% fines	SW	WELL GRADED SAND
			SP	POORLY GRADED SAND
Sands with fines More than 12% fines		SM	SILTY SAND	
		SC	CLAYEY SAND	
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays – Liquid Limit less than 50 Low to medium plasticity	Inorganic	CL	LEAN CLAY
			ML	SILT
		Organic	OL	ORGANIC CLAY
				ORGANIC SILT
	Silts and Clays – Liquid Limit 50 or more Medium to high plasticity	Inorganic	CH	FAT CLAY
			MH	ELASTIC SILT
		Organic	OH	ORGANIC CLAY
				ORGANIC SILT
Highly Organic Soils	Primarily organic matter, dark in color and organic odor	PT	PEAT	

II. DEFINITION OF SOIL COMPONENT PROPORTIONS (ASTM D-2487)

Examples

Adjective Form	GRAVELLY SANDY	>30% to <50% coarse grained component in a fine-grained soil	GRAVELLY LEAN CLAY
	CLAYEY SILTY	>12% to <50% fine grained component in a coarse-grained soil	SILTY SAND
"With"	WITH GRAVEL WITH SAND	>15% to <30% coarse grained component in a fine-grained soil	FAT CLAY WITH GRAVEL
	WITH GRAVEL WITH SAND	>15% to <50% coarse grained component in a coarse-grained soil	POORLY GRADED GRAVEL WITH SAND
	WITH SILT WITH CLAY	>5% to <12% fine grained component in a coarse-grained soil	POORLY GRADED SAND WITH SILT

III. GLOSSARY OF MISCELLANEOUS TERMS

SYMBOLS	Unified Soil Classification Symbols are shown above as group symbols. A dual symbol "-" indicates the soil belongs to two groups. A borderline symbol "/" indicates the soil belongs to two possible groups.
FILL	Man-made deposit containing soil, rock and often foreign matter.
PROBABLE FILL	Soils which contain no visually detected foreign matter but which are suspect with regard to origin.
DISINTEGRATED ROCK (DR)	Residual materials with a standard penetration resistance (SPT) between 60 blows per foot and refusal. Refusal is defined as a SPT of 100 blows for 2" or less penetration.
PARTIALLY WEATHERED ROCK (PWR)	Residual materials with a standard penetration resistance (SPT) between 100 blows per foot and refusal. Refusal is defined as a SPT of 100 blows for 2" or less penetration.
BOULDERS & COBBLES	Boulders are considered rounded pieces of rock larger than 12 inches, while cobbles range from 3 to 12 inch size.
LENSES	0 to ½ inch seam within a material in a test pit.
LAYERS	½ to 12 inch seam within a material in a test pit.
POCKET	Discontinuous body within a material in a test pit.
MOISTURE CONDITIONS	Wet, moist or dry to indicate visual appearance of specimen.
COLOR	Overall color, with modifiers such as light to dark or variation in coloration.



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-1**
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: Craig
Schnabel Representative: D. Lyons
Equipment: CME-55 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan
Ground Surface Elevation: 936.0 (ft) **Total Depth:** 15.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	11:05 AM	Dry	15.0'	---
Casing Pulled	2/20	11:10 AM	Dry	---	13.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	SANDY LEAN CLAY; moist, red and brown, contains mica	CL				SPT 5+9+10		Residual
3.5	SANDY SILT; moist, red and brown, contains mica	ML	932.5	B	5	SPT 4+8+9	MC = 28.2%	
6.0	DISINTEGRATED ROCK, sampled as sandy silt; moist, red and brown, contains mica	DR	930.0			SPT 10+50		
8.5	DISINTEGRATED ROCK, sampled as fine to coarse silty sand; moist, brown, contains mica	DR	927.5	C	10	SPT 50/4"		Augers scraping
15.0			921.0		15	SPT 50/1"		

Bottom of Boring at 15.0 ft.
 Auger refusal at 15.0 ft.
 Boring terminated at auger refusal.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-1A**
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: Craig
Schnabel Representative: D. Lyons
Equipment: CME-55 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan
Ground Surface Elevation: 935.5 (ft) **Total Depth:** 19.4 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Observation Well	2/20	11:25 AM	Dry	19.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	See Boring B-1 for strata description. Boring B-1A offset 10.0' north of B-1.			B				Residual
					5			
					10			
				C				
15.0	DISINTEGRATED ROCK, sampled as silty sand; moist, brown, contains mica	DR	920.5		15			
19.4			916.1			SPT 50/5"		

Bottom of Boring at 19.4 ft.
 Auger refusal at 19.4 ft.
 Boring terminated at auger refusal.
 Observation well installed upon completion.

TEST BORING LOG 08160020.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-2**
Contract Number: 08160020
Sheet: 1 of 2

Contractor:
Contractor Foreman: J. White
Schnabel Representative: R. Reed
Equipment: CME-550X (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan

Ground Surface Elevation: 964.0 (ft) **Total Depth:** 61.4 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	11:50 AM	Dry	61.4'	---
Casing Pulled	2/20	12:07 PM	Dry	---	53.2'

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
3.5	FINE SANDY SILT; moist, reddish brown, contains mica	ML	960.5			SPT 5+4+4	LL = NP % Passing #200 = 41.4	Residual
6.0	FINE SILTY SAND; moist, light brown, contains mica	SM	958.0		5	SPT 4+4+4	MC = 16.5%	
	FINE SILTY SAND; moist, white and light brown	SM		B	10	SPT 3+4+6	MC = 16.1%	
			15		SPT 6+7+8	MC = 12.1%		
			20		SPT 4+5+8	MC = 17.9%		
			25		SPT 10+10+13	MC = 11.2%		
23.5	FINE SILTY SAND; moist, light brown, contains weathered rock fragments	SM	940.5		25	SPT 13+23+12	MC = 12.3%	
						SPT 14+12+34	MC = 10.3%	

(continued)



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-2**
Contract Number: 08160020
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	FINE SILTY SAND; moist, light brown, contains weathered rock fragments <i>(continued)</i>	SM		B	35	SPT 11+11+12	MC = 9.3%	Residual <i>(continued)</i>
38.5	DISINTEGRATED ROCK, sampled as mica schist ; moist, light brown	DR	925.5	C	40	SPT 12+23+43		
43.5	FINE SILTY SAND; moist, brown and light brown, contains mica	SM	920.5	B	45	SPT 15+22+25	MC = 7.7%	
		SM		B	50	SPT 9+16+25	MC = 9.5%	
		SM		B	55	SPT 13+11+17	MC = 8.2%	
58.5	DISINTEGRATED ROCK, sampled as mica schist; moist, brown	DR	905.5	C	60	SPT 50/4"		Hard Augering at 58.0'
61.4			902.6					

Bottom of Boring at 61.4 ft.
 Auger refusal at 61.4 ft.
 Boring terminated at auger refusal.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-3**
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: Craig
Schnabel Representative: D. Lyons
Equipment: CME-55 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan

Ground Surface Elevation: 887.5 (ft) **Total Depth:** 15.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	12:10 PM	Dry	13.5'	---
Casing Pulled	2/20	12:15 PM	Dry	---	12.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
3.5	SILTY SAND; moist, red and brown, contains mica	SM	884.0	B		SPT 6+10+22		Residual
	DISINTEGRATED ROCK, sampled as silty sand; moist, light gray, contains mica	DR		C	5	SPT 50/6"		
						SPT 25+50/5"		
8.5	SANDY SILT; moist, red and brown, contains mica	ML	879.0	B	10	SPT 11+15+20		
15.0			872.5		15	SPT 11+11+23		

Bottom of Boring at 15.0 ft.
 Boring terminated at selected depth.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-4**
Contract Number: 08160020
Sheet: 1 of 2

Contractor:

Contractor Foreman: Craig

Schnabel Representative: D. Lyons

Equipment: CME-55 (ATV)

Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 2/20/08 **Finished:** 2/20/08

Location: See Boring Location Plan

Ground Surface Elevation: 912.5 (ft) **Total Depth:** 35.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Completion	2/20	1:05 PM	Dry	33.5'	---
Casing Pulled	2/20	1:15 PM	Dry	---	30.6'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
3.5	SANDY LEAN CLAY; moist, red and brown, contains mica	CL	909.0			SPT 3+3+3		Residual
	SILTY SAND; moist, light brown, contains mica	SM		B	5	SPT 15+24+22	MC = 13.1%	
						SPT 4+4+6	MC = 30.2%	
					10	SPT 4+7+8	MC = 28.0%	
					15	SPT 11+14+33		
					20	SPT 9+10+14	MC = 14.0%	
22.0	DISINTEGRATED ROCK, sampled as silty sand; moist, light gray	DR	890.5	C		SPT 50/2"		Augers scraping from 22.0' to 24.0'

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09

(continued)



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-4**
Contract Number: 08160020
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
28.5	DISINTEGRATED ROCK, sampled as silty sand; moist, light gray <i>(continued)</i>	DR	884.0	C				Residual <i>(continued)</i>
	SILTY SAND; moist, light brown, contains mica	SM		B	30	SPT 9+11+12	MC = 15.8%	
35.0			877.5		35	SPT 9+11+12		

Bottom of Boring at 35.0 ft.
 Boring terminated at selected depth.
 Boring backfilled with cuttings upon completion.



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-5**
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: Craig
Schnabel Representative: D. Lyons
Equipment: CME-55 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan

Ground Surface Elevation: 872.0 (ft) **Total Depth:** 15.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	1:43 PM	Dry	13.5'	---
Casing Pulled	2/20	1:50 PM	Dry	---	11.8'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	SANDY LEAN CLAY; moist, red and brown, contains mica	CL				SPT 3+3+3		Residual
3.5	SANDY SILT; moist, brown, contains mica	ML	868.5		5	SPT 3+4+5	MC = 26.4%	
6.0	SILTY SAND; moist, brown, contains mica	SM	866.0	B		SPT 5+4+5	MC = 22.6%	
			10		SPT 4+4+5	MC = 20.6%		
15.0			15		SPT 2+3+4	MC = 18.7%		

Bottom of Boring at 15.0 ft.
 Boring terminated at selected depth.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-6**
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: J. White
Schnabel Representative: R. Reed
Equipment: CME-550X (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan

Ground Surface Elevation: 953.0 (ft) **Total Depth:** 5.9 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	12:50 PM	Dry	5.9'	---
Casing Pulled	2/20	12:57 PM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	LEAN CLAY; moist, red, trace sand, contains mica	CL		B		SPT 4+3+3		Residual
3.5	DISINTEGRATED ROCK, sampled as silty sand; dry, grayish green	DR	949.5	C		SPT 50/3"		Augers scraping at 3.0'
5.9			947.1					Hard augering at 5.0'

Bottom of Boring at 5.9 ft.
 Auger refusal at 5.9 ft.
 Boring terminated at auger refusal.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: B-6A
Contract Number: 08160020
Sheet: 1 of 2

Contractor:
Contractor Foreman: J. White
Schnabel Representative: R. Reed
Equipment: CME-550X (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan
Ground Surface Elevation: 958.5 (ft) **Total Depth:** 47.5 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	2/20	---	Dry	---	---
Completion	2/20	2:40 PM	Dry	---	---
Casing Pulled	2/20	3:30 PM	Dry	---	---
Observation Well	2/20	3:35 PM	Dry	47.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	See Boring B-6 for strata description from 0 to 6.0'. Boring B-6A offset 10.0' west of Boring B-6.						LL = NP % Passing #200 = 35.5	Residual
6.0	FINE TO MEDIUM SILTY SAND; moist, reddish brown and gray, contains weathered rock fragments	SM	952.5	B		SPT 18+17+19	MC = 13.7%	Augers scraping from 5.5' to 6.0'
						SPT 9+10+17	MC = 9.7%	
13.5	DISINTEGRATED ROCK, sampled as silty sand; moist, grayish green and brown	DR	945.0	C		SPT 19+50/3"		
						SPT 50/4"		
						SPT 50/6"		

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09

(continued)



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: B-6A
Contract Number: 08160020
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
28.5	DISINTEGRATED ROCK, sampled as silty sand; moist, grayish green and brown (continued)	DR	930.0	C	30	SPT 12+32+43	MC = 11.4%	Residual (continued)
33.5	DISINTEGRATED ROCK, sampled as fine to medium silty sand; moist, brown and white, contains mica	DR	925.0	B	35	SPT 11+13+21		
38.5	FINE TO MEDIUM SILTY SAND; moist, brown and gray, contains mica	SM	920.0		40	SPT 14+33+40		
47.5	DISINTEGRATED ROCK, sampled as silty sand; moist, brownish gray and white	DR	911.0	C	45	SPT 50/2"		

Bottom of Boring at 47.5 ft.
 Auger refusal at 47.5 ft.
 Boring terminated at auger refusal.
 Observation well installed upon completion.

Augers scraping at 47.5'

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: B-7
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: Craig
Schnabel Representative: D. Lyons
Equipment: CME-55 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan

Ground Surface Elevation: 895.5 (ft) **Total Depth:** 15.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	3:12 PM	Dry	13.5'	---
Casing Pulled	2/20	3:19 PM	Dry	---	12.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
3.5	SANDY LEAN CLAY; moist, red and brown, contains mica	CL	892.0	B		SPT 2+7+9	MC = 18.8%	Residual
	SILTY SAND; moist, red and brown, contains mica	SM			5	SPT 5+8+7		
					10	SPT 11+13+13		
					10	SPT 10+9+11		
13.5	FINE TO COARSE SILTY SAND; moist, dark grayish	SM	882.0		SPT 16+15+13	MC = 20.5%	Augers scraping from 13.0' to 13.5'	
15.0			880.5	15		MC = 4.5%		

Bottom of Boring at 15.0 ft.
 Boring terminated at selected depth.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Mainstream Phase 1A Preliminary Study
 US 220 South
 Henry County, Virginia

Boring Number: **B-8**
Contract Number: 08160020
Sheet: 1 of 1

Contractor:
Contractor Foreman: Craig
Schnabel Representative: D. Lyons
Equipment: CME-55 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 2/20/08 **Finished:** 2/20/08
Location: See Boring Location Plan

Ground Surface Elevation: 911.5 (ft) **Total Depth:** 9.5 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Completion	2/20	2:30 PM	Dry	9.5'	---
Casing Pulled	2/20	2:42 PM	Dry	---	8.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	SANDY LEAN CLAY; moist, red and brown, contains mica	CL				SPT 4+5+6		Residual
3.5	SANDY SILT; moist, red and brown, contains mica	ML	908.0	B		SPT 7+11+17		
6.0	DISINTEGRATED ROCK, sampled as silty sand; moist, reddish brown and gray	DR	905.5	C		SPT 50/5"		
9.5			902.0			SPT 50/4"		Augers scraping from 9.0' to 9.5'

Bottom of Boring at 9.5 ft.
 Auger refusal at 9.5 ft.
 Boring terminated at auger refusal.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 08160020.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-12**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/27/09 **Finished:** 4/27/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	4/27	---	Dry	---	---
Completion	4/27	2:05 PM	Dry	31.0'	---
Casing Pulled	4/27	2:19 PM	Dry	---	19.0'

Ground Surface Elevation: 986.5 (ft) **Total Depth:** 31.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
3.3	FINE TO COARSE SILTY SAND; moist, white and tan, contains mica, and rock fragments	SM				SPT WOH+2+4		Residual
4.0	SANDY ELASTIC SILT; moist, light brown, contains mica	MH	983.2			SPT 5+3+15	MC = 13.2%	
	FINE SILTY SAND; moist, light brown, contains mica		982.5		5	SPT 5+16+25	MC = 7.5%	Augers scraping at 5.5'
						SPT 9+11+16		
				B	10	SPT 10+17+20	MC = 5.8%	
					15	SPT 7+10+13		
19.0	DISINTEGRATED ROCK, sampled as fine sand with silt; moist, light brown, contains mica	DR	967.5		20	SPT 26+52+39	MC = 5.3%	Augers scraping at 17.5'
					25	SPT 72+28/2"		
31.0			955.5	C	30	SPT 46+54/1"	MC = 7.1%	Augers scraping at 29.5'

Bottom of Boring at 31.0 ft.
 Auger refusal at 31.0 ft.
 Boring backfilled with cuttings upon completion.
 Outcrop at surface.

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-13**
Contract Number: 09160023
Sheet: 1 of 2

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/27/09 **Finished:** 4/27/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	4/27	4:30 PM	54.0'	54.0'	---
Completion ▾	4/27	4:46 PM	53.5'	54.0'	---
Casing Pulled	4/27	5:00 PM	Dry	---	36.4'

Ground Surface Elevation: 949.5 (ft) **Total Depth:** 54.6 ft

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS	
					DEPTH	DATA			
4.0	SANDY SILT; moist, light orangish brown and gray, contains mica	ML	945.5	B	2+4+6	SPT		Residual	
					3+4+5	SPT			
	POORLY GRADED SAND; moist, white, contains mica, and rock fragments	SP			5	5+6+7	SPT		
							3+5+6		SPT
					10	5+8+9	SPT		
					15	9+9+10	SPT		
19.0	POORLY GRADED SAND WITH SILT; moist, light brown, contains mica	SP-SM	930.5		20	4+7+8	SPT		
24.5	POORLY GRADED SAND; moist, white, contains mica	SP	925.0		25	7+10+17	SPT		
29.0	POORLY GRADED SAND WITH SILT; moist, light brown, contains mica	SP-SM	920.5		30	14+20+24	SPT		
							SPT		

(continued)



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-13**
Contract Number: 09160023
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	POORLY GRADED SAND WITH SILT; moist, light brown, contains mica <i>(continued)</i>	SP-SM		B		12+12+13		Residual <i>(continued)</i>
			40		SPT 14+21+25			
			45		SPT 15+18+30			
49.0	DISINTEGRATED ROCK, sampled as poorly graded sand with silt; moist, light brown, contains mica	DR	900.5	C	50	SPT 30+46+24/2"		Outside of sampler wet
54.6			894.9		SPT 61+39/1"			

Bottom of Boring at 54.6 ft.
 Boring backfilled with cuttings upon completion.



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-14**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/24/09 **Finished:** 4/24/09
Location: See Location Plan

Ground Surface Elevation: 951.7 (ft) **Total Depth:** 20.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	4/24	---	Dry	---	---
Completion	4/24	11:23 AM	Dry	18.5'	---
Casing Pulled	4/24	11:26 AM	Dry	---	11.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.0	ELASTIC SILT; moist, reddish brown, contains sand, and mica	MH	949.7	B	3	SPT 3+3+5		Residual
4.0	SILT WITH SAND; moist, reddish brown, contains mica	ML	947.7		6	SPT 3+6+10		
6.0	SANDY SILT; moist, orangish brown, contains mica	ML	945.7		5	SPT 3+4+5		
	FINE SANDY SILT; moist, tan and light gray, contains mica	ML			8	SPT 3+8+5		
					10	SPT 3+4+5		
					15	SPT 9+5+6		
18.5	FINE SILTY SAND; moist, white, contains mica	SM	933.2		20	SPT 4+4+5		
20.0			931.7					

Bottom of Boring at 20.0 ft.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-15**
Contract Number: 09160023
Sheet: 1 of 2

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/23/09 **Finished:** 4/23/09
Location: See Location Plan

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	4/23	---	Dry	---	---
Completion	4/24	10:20 AM	Dry	40.5'	---
Casing Pulled	4/24	10:40 AM	Dry	---	33.4'

Ground Surface Elevation: 940.0 (ft) **Total Depth:** 50.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS	
					DEPTH	DATA			
2.0	ELASTIC SILT; moist, reddish brown, contains mica	MH	938.0	B		SPT 2+2+6	LL = NP % Passing #200 = 51.3 MC = 29.3%	Residual	
	SILT WITH SAND; moist, reddish brown, contains mica	ML			5	SPT 3+5+8			
6.0	SANDY SILT; moist, light orangish brown, contains mica	ML	934.0			SPT 2+4+5			MC = 23.3%
						SPT 3+3+3			MC = 15.3%
9.0	FINE SILTY SAND; moist, light brown	SM	931.0			SPT 2+3+4			MC = 13.1%
19.0	POORLY GRADED SAND; moist, gray, contains mica	SP	921.0	C		SPT 11+13+14	MC = 9.9%		
24.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, gray	DR	916.0		25	SPT 31+34+34			
29.0	FINE SILTY SAND; moist, light brown, contains mica	SM	911.0			SPT 4+6+11			MC = 9.3%
				B		SPT			

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09

(continued)



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-15**
Contract Number: 09160023
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	FINE SILTY SAND; moist, light brown, contains mica (continued)	SM		B		7+6+7	MC = 7.5%	Residual (continued)
					40	SPT 4+7+12		
44.7	POORLY GRADED SAND; moist, white, contains mica	SP	895.3		45	SPT 8+7+9	MC = 18.1%	
50.0			890.0		50	SPT 4+5+10		

Bottom of Boring at 50.0 ft.
 Boring backfilled with cuttings upon completion.



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-16**
Contract Number: 09160023
Sheet: 1 of 2

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/22/09 **Finished:** 4/22/09
Location: See Location Plan

Groundwater Observations						
	Date	Time	Depth	Casing	Caved	
Encountered	4/22	---	44.0'	44.0'	---	
Completion	4/22	12:41 PM	48.0'	---	---	
Casing Pulled	4/22	12:54 PM	Dry	---	33.7'	

Ground Surface Elevation: 940.0 (ft) **Total Depth:** 49.4 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.0	ELASTIC SILT WITH SAND; moist, reddish brown, contains mica	MH	938.0	B		SPT 2+2+4	MC = 30.1%	Residual
	SILT WITH SAND; moist, reddish brown, contains mica	ML				SPT 2+4+6		
6.0	POORLY GRADED SAND WITH SILT; moist, tan, contains mica		934.0			SPT 2+3+5		
						SPT 2+3+3	MC = 19.3%	
						SPT 2+3+4		
		SP-SM				SPT 3+4+5	MC = 15.0%	
						SPT 3+5+6		Firm drilling at 19.5'
24.0	DISINTEGRATED ROCK, sampled as poorly graded sand with silt; moist, gray and tan, contains mica	DR	916.0	C		SPT 3+5+6	MC = 6.9%	
29.0	POORLY GRADED SAND WITH SILT; moist, gray and tan, contains mica		911.0	B		SPT 10+15+22		
		SP-SM					SPT	MC = 15.3%

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE: 2008_07_06.GDT 5/14/09

(continued)



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-16**
Contract Number: 09160023
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
39.0	POORLY GRADED SAND WITH SILT; moist, gray and tan, contains mica <i>(continued)</i>	SP-SM	901.0	B	11+9+9		MC = 15.5%	Residual <i>(continued)</i> Outside of sampler wet at 44.0' Hard augering at 44.5' Augers scraping at 48.0'
	DISINTEGRATED ROCK, sampled as poorly graded sand with silt; moist, gray and tan, contains mica	DR			40	SPT 20+19+43		
					45	SPT 5+40+26		
49.4			890.6					

Bottom of Boring at 49.4 ft.
 Boring backfilled with cuttings upon completion.



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-17**
Contract Number: 09160023
Sheet: 1 of 2

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/23/09 **Finished:** 4/23/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	4/23	---	Dry	---	---
Completion	4/23	10:36 AM	Dry	48.5'	---
Casing Pulled	4/23	10:58 AM	Dry	---	25.0'

Ground Surface Elevation: 940.2 (ft) **Total Depth:** 50.0 ft

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.0	ELASTIC SILT WITH SAND; moist, reddish brown, contains mica	MH	938.2	B		SPT WOR+3+3		Residual Firm drilling from 9.5' to 11.5' Soft drilling from 11.5' to 14.0'
	SILT WITH SAND; moist, reddish brown, contains mica	ML			5	SPT 3+2+4		
6.5	FINE SILTY SAND; moist, brown, contains mica	SM	933.7			SPT 3+3+4		
9.5	POORLY GRADED SAND; moist, white and gray, contains mica, and rock fragments	SP	930.7		10	SPT 8+15+20		
14.0	FINE SILTY SAND; moist, brown, contains mica	SM	926.2		15	SPT 4+5+5		
					20	SPT 4+6+6		
24.0	FINE SILTY SAND; moist, white and gray, contains mica, and rock fragments	SM	916.2		25	SPT 19+24+24		
29.0	FINE SILTY SAND; moist, brown, contains mica	SM	911.2		30	SPT 5+10+15		
						SPT		

(continued)



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-17**
Contract Number: 09160023
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	FINE SILTY SAND; moist, brown, contains mica <i>(continued)</i>	SM		B		12+15+17		Residual <i>(continued)</i>
39.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, white, contains mica, and rock fragments	DR	901.2	C	40	SPT 100/3"		
44.0	SILTY SAND; moist, light brown, contains mica	SM	896.2	B	45	SPT 11+17+23		
50.0			890.2		50	SPT 16+10+12		

Bottom of Boring at 50.0 ft.
 Boring backfilled with cuttings upon completion.



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-18**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/23/09 **Finished:** 4/23/09
Location: See Location Plan

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	4/23	---	Dry	---	---
Completion	4/23	12:15 PM	Dry	18.5'	---
Casing Pulled	4/23	12:23 PM	Dry	---	8.7'

Ground Surface Elevation: 900.0 (ft) **Total Depth:** 20.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.5	ELASTIC SILT; moist, reddish brown, contains mica	MH	897.5	B		SPT 3+3+3	MC = 39.3% MC = 28.0% MC = 25.9% MC = 19.9%	Residual
	SILT WITH SAND; moist, reddish brown, contains mica, and rock fragments	ML			5	SPT 3+4+5		
						SPT 2+4+7		
						SPT 3+4+5		
8.5	FINE SILTY SAND; moist, orangish brown, contains mica	SM	891.5		10	SPT 3+4+6		
13.5	SANDY SILT; moist, light brown, contains mica	ML	886.5		15	SPT 3+3+5		
18.5	FINE SILTY SAND; moist, white, contains mica	SM	881.5		SPT 18+25+16	MC = 8.7%		
20.0			880.0					

Bottom of Boring at 20.0 ft.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-19**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/23/09 **Finished:** 4/23/09
Location: See Location Plan

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	4/23	---	Dry	---	---
Completion	4/23	2:00 PM	Dry	28.5'	---
Casing Pulled	4/23	2:10 PM	Dry	---	13.0'

Ground Surface Elevation: 924.8 (ft) **Total Depth:** 30.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.0	SANDY ELASTIC SILT; moist, reddish brown, contains mica	MH	922.8	B		SPT 3+4+8	LL = NP % Passing #200 = 43.7	Residual
4.0	SANDY SILT; moist, reddish brown, contains mica	ML	920.8			SPT 3+4+8		
	FINE SILTY SAND; moist, light brown, contains mica	SM			5	SPT 3+3+4		
						SPT 3+4+5		
					10	SPT 3+3+5		
					15	SPT 3+4+6		
					20	SPT 6+5+6		
			25	SPT 7+9+11				
30.0			894.8	30	SPT 7+9+12			

Bottom of Boring at 30.0 ft.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-20**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/24/09 **Finished:** 4/24/09
Location: See Location Plan
Ground Surface Elevation: 951.2 (ft) **Total Depth:** 28.5 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	4/24	---	Dry	---	---
Completion	4/24	2:16 PM	Dry	28.5'	---
Casing Pulled	4/24	2:23 PM	Dry	---	21.6'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.0	ELASTIC SILT WITH SAND; moist, reddish brown, contains mica	MH	949.2			SPT 2+3+5		Residual
4.0	SILT WITH SAND; moist, reddish brown, contains mica	ML	947.2			SPT 2+4+7	MC = 37.0%	
	FINE SILTY SAND; moist, orangish brown, contains mica	SM	942.2		5	SPT 3+3+6	MC = 28.3%	
						SPT 3+5+6	MC = 17.6%	
9.0	FINE SILTY SAND; moist, white, contains mica	SM	942.2	B	10	SPT 4+4+6	MC = 10.3%	
14.0	POORLY GRADED SAND WITH SILT; moist, orangish brown and black, contains rock fragments, and mica	SP-SM	937.2		15	SPT 7+10+12	MC = 15.5%	
19.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, white, contains mica	DR	932.2	C	20	SPT 9+30+39		
24.0	POORLY GRADED SAND; moist, white	SP	927.2	B	25	SPT 19+44+10		Firm drilling at 22.0'
26.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, white, contains mica	DR	925.2	C				Hard drilling at 26.0'
28.5	Bottom of Boring at 28.5 ft. Auger refusal at 28.5 ft. Boring backfilled with cuttings upon completion.		922.7			SPT 50/0"		Augers scraping from 28.0' to 28.5'

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: B-21
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/24/09 **Finished:** 4/24/09
Location: See Location Plan

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	4/24	---	Dry	---	---
Completion	4/24	3:42 PM	Dry	32.0'	---
Casing Pulled	4/24	3:52 PM	Dry	---	21.0'

Ground Surface Elevation: 981.0 (ft) **Total Depth:** 32.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
2.0	ELASTIC SILT WITH SAND; moist, reddish brown, contains mica, and rock fragments	MH	979.0			SPT 4+5+5		Residual
4.0	SILT WITH SAND; moist, reddish brown, contains mica, and rock fragments	ML	977.0			SPT 5+6+10	MC = 17.7%	
	FINE SILTY SAND; moist, orange and white, contains mica	SM		B	5	SPT 4+3+4	MC = 18.0%	
						SPT 4+5+6	MC = 18.9%	
					10	SPT 4+6+7		
14.0	FINE SILTY SAND; moist, brown, contains mica	SM	967.0			SPT 3+4+4	MC = 19.3%	
19.0	DISINTEGRATED ROCK, sampled as poorly graded gravel with sand; moist, grayish green	DR	962.0	C	20	SPT 53+47/0"	MC = 11.4%	Augers scraping at 19.5'
24.5	SILT WITH SAND; moist, brown and black, contains mica, and rock fragments	ML	956.5	B	25		MC = 23.6%	
29.0	DISINTEGRATED ROCK, sampled as silt with sand; moist, brown and black, contains mica, and rock fragments	DR	952.0	C	30	SPT 18+7+8 SPT 4+16+84/3"	MC = 28.9%	Augers scraping at 27.0'

Bottom of Boring at 32.0 ft.
 Auger refusal at 32.0 ft.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-22**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/27/09 **Finished:** 4/27/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	4/27	---	Dry	---	---
Completion	4/27	10:36 AM	Dry	---	---
Casing Pulled	4/27	10:46 AM	Dry	---	13.8'

Ground Surface Elevation: 939.5 (ft) **Total Depth:** 21.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
4.0	FILL, sampled as sandy elastic silt; moist, gray, contains glass, mica, and organics	FILL	935.5	F		SPT WOH+2+1 SPT 1+1+2		Fill
6.0	FINE SILTY SAND; moist, orangish brown, contains mica	SM	933.5	B	5	SPT 3+5+7		Residual
9.0	POORLY GRADED SAND WITH SILT; moist, white and gray, contains mica	SP-SM	930.5		10	SPT 7+10+30		
14.0	DISINTEGRATED ROCK, sampled as fine sand; moist, white and gray, contains mica	DR	925.5	C	15	SPT 6+100/5"		Hard, Augers scraping from 9.0' to 12.0'
21.0	DISINTEGRATED ROCK, sampled as sandy silt; moist, white and brown, contains mica	DR	918.5		20	SPT 50/0.5"		

Bottom of Boring at 21.0 ft.
 Auger refusal at 21.0 ft.
 Boring backfilled with cuttings upon completion.

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-23**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/27/09 **Finished:** 4/27/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	4/27	---	Dry	---	---
Completion	4/27	11:17 AM	Dry	8.0'	---
Casing Pulled	4/27	11:20 AM	Dry	---	---

Ground Surface Elevation: 952.5 (ft) **Total Depth:** 8.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
6.0	SILT WITH SAND; moist, orangish brown, contains mica	ML	946.5	B	5	SPT 3+2+4	MC = 28.8%	Residual Augers scraping at 7.0'
						SPT 3+3+4	MC = 28.8%	
						SPT 2+3+5	MC = 28.8%	
8.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, white and gray, contains mica, and rock fragments	DR	944.5	C		SPT 17+56+44/0"	MC = 10.5%	

Bottom of Boring at 8.0 ft.
 Auger refusal at 8.0 ft.
 Boring backfilled with cuttings upon completion.
 Boring B-23 moved 40.0' East of staked location.
 Outcrop in logging road between Borings B-22 and B-23.



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-23A**
Contract Number: 09160023
Sheet: 1 of 1

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/27/09 **Finished:** 4/27/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	4/27	---	Dry	---	---
Completion	4/27	11:52 AM	Dry	34.0'	---
Casing Pulled	4/27	12:05 PM	Dry	---	21.4'

Ground Surface Elevation: 950± (ft) **Total Depth:** 34.0 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
0.0 - 9.0	Auger probe to 9.0'. No SPT sampling, see Boring B-23 for strata descriptions.							Clear cut with brush and stumps
9.0 - 14.0	POORLY GRADED SAND; moist, gray, contains mica, and rock fragments	SP	941.0		10	SPT 6+13+10	MC = 11.7%	
14.0 - 29.0	FINE SILTY SAND; moist, brown, contains mica	SM	936.0	B	15	SPT 4+4+6	MC = 16.6%	
					20	SPT 3+4+6		
					25	SPT 4+6+9	MC = 12.0%	
29.0 - 34.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, white, contains mica, and rock fragments	DR	921.0	C	30	SPT 55+45/0"	MC = 11.5%	

Bottom of Boring at 34.0 ft.
 Boring backfilled with cuttings upon completion.
 Boring moved 40.0' East of B-23.

SPT 25/0"

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE: 2008_07_06.GDT 5/14/09



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-24**
Contract Number: 09160023
Sheet: 1 of 2

Contractor: Blue Ridge Drilling, Inc.
 Boones Mill, Virginia
Contractor Foreman: R. Rowe
Schnabel Representative: R. Reed
Equipment: CME-45 (Track)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 4/22/09 **Finished:** 4/22/09
Location: See Location Plan

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	4/22	---	Dry	---	---
Completion	4/22	3:21 PM	Dry	48.0'	---
Casing Pulled	4/22	3:37 PM	Dry	---	26.0'

Ground Surface Elevation: 965.5 (ft) **Total Depth:** 49.3 ft

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
	FILL, sampled as fine sandy elastic silt; moist, tan, contains roots	FILL		F		SPT 2+1+2		Fill
3.0			962.5			SPT WOH+1+5	MC = 25.3%	Residual
4.0	ELASTIC SILT WITH SAND; moist, reddish brown, contains mica	MH	961.5					
6.0	POORLY GRADED SAND; moist, reddish brown and white, contains rock fragments	SP	959.5		5	SPT 6+10+15	MC = 15.2%	
	POORLY GRADED SAND; moist, light tan, contains mica	SP				SPT 4+3+4	MC = 12.1%	
9.0	POORLY GRADED SAND; moist, orange and white, contains rock fragments	SP	956.5		10	SPT 5+9+9		
14.0	POORLY GRADED SAND WITH SILT; moist, grayish tan	SP-SM	951.5		15	SPT 4+4+7	MC = 14.9%	
				B		SPT 4+6+7		
24.0	POORLY GRADED SAND WITH SILT; moist, white, contains mica, and rock fragments	SP-SM	941.5		25	SPT 3+4+5	MC = 13.8%	Contains 1" layers of poorly graded tan and gray sand
					30	SPT 7+8+11		
34.0		SP	931.5			SPT	MC = 14.6%	

TEST BORING LOG 09160023.GPJ - SCHNABEL DATA TEMPLATE: 2008_07_06.GDT 5/14/09

(continued)



TEST BORING LOG

Project: Commonwealth Crossing Business Center
 U.S. Route 220 South, Henry County
 Martinsville, Virginia

Boring Number: **B-24**
Contract Number: 09160023
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	POORLY GRADED SAND; moist, white and tan, contains mica (<i>continued</i>)	SP		B		13+18+28		Residual (<i>continued</i>)
39.0	DISINTEGRATED ROCK, sampled as poorly graded sand; moist, white	DR	926.5		40	SPT 100/5"		
44.0	DISINTEGRATED ROCK, sampled as poorly graded sand with silt; moist, tan and gray, contains mica	DR	921.5	C	45	SPT 31+34+38	MC = 9.5%	
49.3			916.2			SPT 100/3"		

Bottom of Boring at 49.3 ft.
 Boring backfilled with cuttings upon completion.

BORING LOG



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Report No.: **J62-183D**

Date: **August 2007**

Client: **Henry County**

Project: **Proposed Roma Site, Henry County, Virginia**

Boring No.: **B-1 (1 of 1)** Total Depth **21.0'** Elev: **894** Location: **See Attached Map**

Type of Boring: **2.25" HSA CME 55** Started: **8/9/07** Completed: **8/9/07** Driller: **B. Maxson**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ft)	REMARKS
889.3	5.0	RESIDUUM: Stiff to medium stiff, red brown, moist, fine to medium sandy SILT (ML) with little mica and trace organics	5-5-7	1.0	12	Subsurface water was not encountered immediately upon completion of drilling.
				2.5		
			2-3-4	3.5	7	
				5.0		
882.3	12.0	Medium stiff, orange red and tan, moist, fine to coarse sandy SILT (ML) with some mica	2-2-3	6.0	5	
				7.5		
			3-2-4	8.5	6	
				10.0		
877.3	17.0	Medium stiff, tan brown, moist fine to coarse sandy SILT (ML) with some mica	2-3-4	13.5	7	
				15.0		
			7-14-47	18.5	61	
873.3	21.0	Auger refusal at 21 feet		20.0		

BORING LOG J62-183D.GPJ F&R.GDT 8/17/07

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

BORING LOG



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Report No.: **J62-183D**

Date: **August 2007**

Client: **Henry County**

Project: **Proposed Roma Site, Henry County, Virginia**

Boring No.: **B-2 (1 of 2)** Total Depth **52.5'** Elev: **822** Location: **See Attached Map**

Type of Boring: **2.25" HSA CME 55** Started: **8/9/07** Completed: **8/9/07** Driller: **B. Maxson**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ft)	REMARKS	
819.3	3.0	RESIDUUM: Medium dense, light gray, silty fine to coarse SAND (SM) with trace coarse gravel	5-5-6	1.0	11	Subsurface water was encountered during drilling and immediately upon completion of drilling at 17.5 feet and 9 feet below the existing ground surface elevation, respectively.	
				2.5			
			2-2-2	3.5			4
				5.0			
			WOH-1-2	6.0			3
				7.5			
			- No recovery	8.5			4
				10.0			
				13.5			4
				15.0			
805.3	17.0	Stiff, brown, wet, fine to coarse sandy SILT (ML) with some mica	2-4-6	18.5	10		
				20.0			
800.3	22.0	Loose, tan and white, wet, silty fine to coarse SAND (SM) with some mica	2-3-3	23.5	6		
				25.0			
			2-3-6	28.5		9	
				30.0			
790.3	32.0	Medium dense, tan and white, wet, silty fine to coarse SAND (SM) with some mica	3-6-8	33.5	14		
				35.0			
			4-6-11	38.5		17	
				40.0			

BORING LOG J62-183D.GPJ F&R.GDT 8/17/07

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

BORING LOG



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Report No.: **J62-183D**

Date: **August 2007**

Client: **Henry County**

Project: **Proposed Roma Site, Henry County, Virginia**

Boring No.: **B-2 (2 of 2)** Total Depth: **52.5'** Elev: **822** Location: **See Attached Map**

Type of Boring: **2.25" HSA CME 55** Started: **8/9/07** Completed: **8/9/07** Driller: **B. Maxson**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ft)	REMARKS
775.3	47.0	Medium dense, tan and white, wet, silty fine to coarse SAND (SM) with some mica	5-8-10	43.5	18	
				45.0		
769.8	52.5	Dense, brown, moist, silty fine to coarse SAND (SM) with little mica	11-23-24	48.5	47	
				50.0		
		Auger refusal at 52.5 feet				

BORING LOG J62-183D.GPJ F&R.GDT 8/17/07

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

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Report No.: **J62-183D**

Date: **August 2007**

Client: Henry County						
Project: Proposed Roma Site, Henry County, Virginia						
Boring No.: B-3 (1 of 2)		Total Depth: 64.5'	Elev.: 978	Location: See Attached Map		
Type of Boring: 2.25" HSA CME 55		Started: 8/8/07	Completed: 8/8/07	Driller: B. Maxson		
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ft)	REMARKS
973.0	5.0	RESIDUUM: Very stiff to stiff, red orange, moist, fine to medium sandy SILT (ML) with some mica	7-7-10	1.0	17	Subsurface water was encountered during drilling at 56 feet below the existing ground surface elevation.
				2.5		
			3-4-5	3.5		
970.0	8.0	Medium stiff, orange brown, moist, fine to coarse sandy SILT (ML) with some mica	2-3-4	6.0	7	
				7.5		
			3-4-7	8.5		
966.0	12.0	PARTIALLY WEATHERED ROCK: Sampled as very dense, white and orange, dry, silty fine to coarse SAND (SM)		10.0	11	
			16-22-50/6	13.5		
				15.0		
961.0	17.0	RESIDUUM: Medium dense, tan, dry, silty fine to medium SAND (SM) with little mica	7-9-9	18.5	18	
				20.0		
956.0	22.0	Very dense, white and orange, dry, silty fine to coarse SAND (SM)	24-38-38	23.5	76	
				25.0		
951.0	27.0	Medium dense, tan, dry, silty fine to coarse SAND (SM) with some mica	11-10-10	28.5	20	
				30.0		
946.0	32.0	Very dense, tan and white, dry, silty fine to coarse SAND (SM) with some mica	25-34-40	33.5	74	
				35.0		
941.0	37.0	PARTIALLY WEATHERED ROCK: Sampled as very dense, tan and white, moist, silty fine to coarse SAND (SM) with little mica	25-50/3	38.5		
				39.3		

BORING LOG J62-183D.GPJ F&R.GDT 8/17/07

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

BORING LOG



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Report No.: **J62-183D**

Date: **August 2007**

Client: Henry County							
Project: Proposed Roma Site, Henry County, Virginia							
Boring No.: B-3 (2 of 2)		Total Depth: 64.5'	Elev.: 978	Location: See Attached Map			
Type of Boring: 2.25" HSA CME 55		Started: 8/8/07	Completed: 8/8/07	Driller: B. Maxson			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ft)	REMARKS	
		PARTIALLY WEATHERED ROCK: Sampled as very dense, tan and white, moist, silty fine to coarse SAND (SM) with little mica					
				28-50/3	43.5 44.3		
				50/5	48.5		
				27-42-50/1	53.5 54.6		
			- wet	50/1	58.5		
918.0	60.0		Sampled as very dense, gray and black, wet, silty fine to coarse SAND (SM) with little mica				
913.5	64.5			50/1	63.5		
		Auger refusal at 64.5 feet					

BORING LOG J62-183D.GPJ F&R.GDT 8/17/07

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.