November 7, 2011

Mr. Matthew Moore, P.E.
VDOT – Culpepper District Office
1601 Orange Road
Culpepper, Virginia 22701

ECS Project No. 36:1061

Reference: Geotechnical Data Report
US Route 29 Bypass
VDOT Project No. 0029-02-844, PE101 (UPC 102419)
Charlottesville, Albemarle County, Virginia

Dear Mr. Moore:

ECS Mid-Atlantic, LLC (ECS) is pleased to the attached Geotechnical Data Report for the above-referenced project. Our services have been provided in accordance with our On-Call Limited Services Geotechnical Design Contract II Statewide (Contract No. 30820) and ECS Scope and Fee Proposal No. 36:0010-GP, dated September 7, 2011. The Geotechnical Data Report includes recently conducted soil test boring logs in gINT format, previously completed soil test boring logs provided by VDOT, asphalt pavement and rock coring logs, laboratory analyses, preliminary rigid and flexible pavement section thicknesses, and limited geotechnical recommendations for design and construction. Our geotechnical exploration was based on performing a total of forty-five soil test borings, ten rock cores, and seven pavement cores for the proposed construction of the US Route 29 Western Bypass.

We have appreciated the opportunity to be of service to you. If you have any questions regarding the information presented herein, or if we can be of further assistance to you during design and construction, please do not hesitate to contact us.

Respectfully,
ECS MID-ATLANTIC, LLC

Brian M. Jasion, E.I.T.
Project Manager

J. Randy Wirt, P.E.
Principal Engineer – Vice President

COMMONWEALTH OF VIRGINIA
11/7/11
JAMES RANDOLPH WIRT
No.037759
PROFESSIONAL ENGINEER

BMJ/JRW: bmj I:\{Projects}\Geotechnical\1061 Route 29 Bypass\f-Report Prep\Rt. 29 GDR Cover Letter Final.doc

U.S. Route 29 Bypass
Charlottesville, Virginia

Geotechnical Engineering Data Report

Project No. 0029-002-844, PE101 (UPC 102419)

Virginia Department of Transportation

November 7, 2011

Table of Contents

SECTION **PAGE**

1.0 INTRODUCTION 2
2.0 PROJECT DESCRIPTION 2
3.0 SITE DESCRIPTION 2
4.0 SITE GEOLOGY 2
5.0 SUBSURFACE EXPLORATION 3
6.0 LABORATORY TESTING 3
7.0 SUBSURFACE CONDITIONS 5
7.1 Generalized Subsurface Stratigraphy 5
7.2 Groundwater 6
8.0 PAVEMENTS 6
8.1 Existing Pavement 6
8.2 Minimum Pavement Sections – Flexible and Rigid 7
9.0 GEOTECHNICAL ENGINEERING CONSIDERATIONS DURING DESIGN AND CONSTRUCTION 8
9.1 Unsuitable Materials 8
9.2 Drainage Design and Construction 9
10.0 LIMITATIONS 9

APPENDIX A

Aerial View of Project Area

APPENDIX B

Boring Logs
Asphalt Core Photographs
Rock Core Photographs
Previous Borings:
- Hydraulic Road over Route 29 Bypass – 1997
- Route 29 Bypass Preliminary Soil Survey – 1997
- Route 29 Bypass over the South Fork of the Rivanna River Borings – 1997
- Route 250 Ramp A to NBL Route 29 Bypass Borings – 1997
- Route 29 Bypass over Route 250 Borings – 1997
- Old Ivy Road over Route 29-250 Bypass Borings – 1997
- CSX Railroad over Route 250 Bypass Borings – 1997
- Woodburn Road over Route 29 Bypass Borings – 1997
- Roslyn Ridge Road over Route 29 Bypass Borings – 1997
- Route 29 Bypass Stormwater Management Borings – 1997
- Stillhouse Mountain Tunnel Borings – 1996

APPENDIX C

Laboratory Test Summary
Atterberg Limits Test Reports
Standard Proctor Reports
California Bearing Ratio Reports

1.0 INTRODUCTION

The purpose of this Geotechnical Data Report (GDR) is to present the preliminary subsurface exploration findings and limited recommendations for earthwork and pavement structures for the U.S. Route 29 Bypass in Charlottesville, Virginia to prospective design-builders and to provide a uniform basis for preparation of proposals. The subsurface investigation was performed by ECS under its On-Call Limited Services Geotechnical Design Contract II Statewide (Contract No. 30820). Limitations on use of this report and the geotechnical data provided herein are discussed in Section 10.

2.0 PROJECT DESCRIPTION

The project includes the design and construction of the proposed U.S. Route 29 Western Bypass including interchanges, overpasses and/or underpasses and tie-ins with existing Route 29/250 Bypass, Route 250 (southern terminus) and Route 29 (northern terminus). The Boring Location Plan will be provided by VDOT under separate cover.

The project will begin in the vicinity of where Ivy Road (U.S. Route 250) joins with U.S. Route 29 west of Charlottesville, Virginia. The proposed alignment then follows Route 29/250 north to the Leonard Sandridge Road near St. Annes Bellfield School. The bypass then continues north and west, eventually re-joining with Route 29 (Seminole Trail) just north of the South Fork Rivanna River.

3.0 SITE DESCRIPTION

The project site generally consists of rolling terrain with areas of moderately-dense hardwoods and evergreens, moderately-dense low-lying vegetation and pastures. The section of the alignment between borings 11BH-050 to 11BH-071 consists of steep hills with slopes of approximately 2:1 and steeper primarily consisting of hardwoods and evergreens. Small creeks were encountered at five locations along the alignment. Overhead utility lines were encountered at isolated locations; however, the location of the lines did not affect the boring locations. The land adjacent to the right of way limits is predominately undeveloped land, farmland, and some commercial and residential areas. Appendix A includes an aerial view of the project area.

4.0 SITE GEOLOGY

Reference to the Geologic Map of Virginia 1993 (Commonwealth of Virginia, Department of Mines, Minerals and Energy, Division of Mineral Resources) indicates that the project site is located within the Blue Ridge Anticlinorium geologic column consisting of the following formations: Porphyoblastic Biotite-Plagioclase Augen Gneiss, Lynchburg Group – Fanglomerate, Lynchburg Group; Metagraywacke, Lynchburg Group; Graphitic phyllite and metasiltstone, and Robertson River Igneous Suite - Rivanna granite. The primary underlying rock types include augen gneiss, conglomerate, meta-argillite, phyllite, and granite.

5.0 SUBSURFACE EXPLORATION

A subsurface exploration program was performed at the project site between September 19 and October 5, 2011. Subsurface conditions were explored by drilling a total forty-five standard penetration test (SPT) borings, ten rock cores, and seven asphalt pavement cores. The borings were drilled by a subcontractor to ECS, Connelly & Associates, Inc. The borings were staked and surveyed by NXL, Inc. Monitoring of the drilling and subsequent logging of borings was performed by an ECS geotechnical engineer or geologist. Standard penetration tests were performed in general accordance with ASTM D 1586. Bulk soil samples were obtained from the auger cuttings that are generally representative of major soil types encountered in the borings. The boring logs are included in Appendix B.

The boring logs were prepared and the soil samples described in general accordance with the guidelines included in Chapter 3 of VDOT's Materials Division Manual of Instructions (June 2011 revision). Soil descriptions on the boring logs are visual and are generally in accordance with the Unified Soil Classification System (USCS) as described in ASTM D 2488. Laboratory samples tested were also classified in accordance with the Unified Soil Classification System (ASTM D 2487). It should be noted that some variation can be expected between samples visually classified, as depicted on the logs, and samples classified in the laboratory.

Soil, pavement core and rock core samples obtained from the subsurface investigation are available for inspection at the office of the Culpeper District Materials Engineer, 1601 Orange Road, Culpeper, VA 22701. Please call Matthew Moore, P.E. (540-727-7098) to obtain access to the samples.

6.0 LABORATORY TESTING

Natural moisture content tests were performed on a majority of the SPT samples in general accordance with ASTM D 2216. The results of these tests are shown on the boring logs in Appendix B. Atterberg limits tests and amount of material in soils finer than No. 200 sieve were performed on selected SPT samples in general accordance with ASTM D 4318 and ASTM D 1140, respectively to aid in the classification of soils encountered in the borings. Particle size analysis and Atterberg limits testing, in general accordance with ASTM D 422 (without hydrometer) and ASTM D 4318, were performed on select bulk samples. California Bearing Ratio (CBR) and moisture-density relations were determined on the bulk samples in accordance with VTM-8, and VTM-1, respectively. Laboratory test results are shown on the boring logs in Appendix B and/or laboratory test reports in Appendix C. The results of CBR testing completed in 1997 are presented in Table 1. The results of the limited and recent CBR testing is presented in Table 2. These two data sets were evaluated and delineated based on three predominant soil types observed. A summary of this breakdown is presented in Table 3.

Table 1 – CBR Test Results Performed in 1997

SAMPLE	USCS	CBR	SAMPLE	USCS	CBR
1	ML	7.7	19	SM	26.3
2	SM	8.5	20	MH	9.1
3	SM	12.0	21	ML	2.1
4	ML	1.1	23	ML	4.0
5	ML	9.1	24	SM	46.1
6	MH	0.8	25	SM	33.8
7	ML	13.5	26	SM	25.5
8	ML	0.4	27	ML	31.4
9	ML	10.2	28	ML	6.9
10	ML	6.7	29	ML	10.6
11	MH	9.6	31	SM	39.5
12	ML	1.2	32	SM	13.8
13	ML	7.0	34	SM	5.9
14	MH	10.7	35	SM	16.3
15	ML	1.1	36	ML	25.1
16	CL	19.2	38	MH	8.6
17	SM	19.2	40	SM	27.2
18	SC	20.6	41	SM	11.3

Table 2 – CBR Tests Performed October 2011

Sample	Boring No.	Depth (ft)	USCS	CBR
CBR-1	11BH-032	0 - 6	SM	37.0
CBR-2	11BH-055	0 - 10	SM	16.0
CBR-3	11BH-104	0 - 10	ML	17.6
CBR-4	11BH-124	0 - 10	ML	20.5
CBR-5	11BH-002	2 - 10	ML	8.0

Table 3 – CBR Testing Summary

Soil Type	USCS	No. of Samples	Range of CBR's		Average CBR
1	ML/CL	18	1.1	25.1	9.5
2	SM/SC	13	5.9	33.8	18.2
3	MH	4	8.6	10.7	9.5

7.0 SUBSURFACE CONDITIONS

7.1 Generalized Subsurface Stratigraphy

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

Topsoil. Topsoil was encountered in thirty-seven of the forty-five borings. The thickness of topsoil, where encountered, ranged approximately 1 to 12 inches.

Fill or Possible Fill. Fill or possible fill was encountered in four of the forty-five borings. Soils that contain evidence of being disturbed, having remolded structure were generally encountered in areas of existing pavement. The fill soils, excluding pavement structure materials, were very similar in nature to the native in-situ soils. A majority of the fill soils were classified (based on visual-manual and/or laboratory testing) as Lean CLAY (CL), non- to moderately-plastic SILT (ML) or poorly-graded SAND (SP). The depth of fill and/or possible fill, where encountered, ranged from about 1 to 6 feet below existing elevations. The consistency of the fill and/or possible fill soils ranged from stiff to very stiff for these fine-grained soils.

Residuum. This stratum comprises soils that have weathered from the underlying parent bedrock. Residuum commonly retains the structure of the parent bedrock but displays less cohesion and overall strength.

The upper-zone residuum, generally 1 to 2 feet thick, comprises the near-surface soils, typically consists of lean CLAY (CL), SILT (ML) or elastic SILT (MH) and contains varying amounts of weathered to highly weathered rock fragments. The presence of highly weathered rock fragments typically increases with depth. The consistency of the upper-zone residuum ranged from very soft to hard. SPT N-values ranged from 1 to 42 with an average value of about 12.

The lower-zone residuum generally consists of non- to moderately-plastic SILT (ML) with varying amounts of sand, fine to medium silty SAND (SM), fine to medium clayey SAND (SC) and/or fine to medium poorly-graded SAND (SP) with trace amounts of clay and silt. The thickness of this stratum, within the total depth of auger boring, ranged between 2 feet and 31 feet. The consistency/relative density of the lower-zone residuum ranged between soft/loose to very hard/very dense. SPT N-values ranged from 1 to 62 with an average value of about 20.

Highly Weathered Rock. Highly weathered rock is generally identified as material with SPT “N” values greater than 60 blows per foot (bpf) that has retained the structure of the parent bedrock. This stratum was first encountered between depths of 1.2 feet to 38.3 feet below existing site grades. The thickness of this stratum, within the total depth of auger boring, ranged from approximately 6 inches to 32 feet. This stratum represents a transitional zone between the overlying residuum and underlying bedrock.

Rock. Rock coring was performed in ten of the forty-five borings performed. Rock was first encountered between depths of 6.4 feet to 46.3 feet below existing site grades. The total length of rock coring in each boring ranged from 5 feet to 13.5 feet. The rock types encountered during coring consisted of gneiss, granite, and metasandstone. The Rock Quality Designation (RQD) of the core samples ranged from 25 to 100 with and average value of about 74. Core recovery of the samples ranged from 72 to 100 with an average value of about 95.

7.2 Groundwater

Groundwater readings were recorded during drilling and upon completion of each boring except as noted on the boring logs. The ground water elevations are noted in Table 4.

Table 4 – Observed GWT Elevations at Time of Drilling

Boring No.	Boring El.	GWT El.	Depth (ft)
11BH-002	532.7	514.7	18.0
11BH-012	640.8	625.8	15.0
11BH-038	479.5	467.5	12.0
11BH-041	472.6	458.1	14.5
11BH-050	465.7	437.2	28.5
11BH-051	442.4	435.4	7.0
11BH-055	473.3	428.3	45.0
11BH-058	436.1	418.1	18.0
11BH-077	551.0	549.0	2.0
11BH-080	504.6	459.6	45.0
11BH-083	610.2	605.4	4.8

The water levels indicated on the boring logs represent an estimate of the ground water levels that existed at the time of drilling. The groundwater level will vary with changes in precipitation and seasons, and can be affected by construction activity.

8.0 PAVEMENTS

8.1 Existing Pavement

Existing asphalt pavements were cored at the following boring locations: 11BH-002, 11BH-004, 11BH-007, 11BH-017, 11BH-021, 11BH-077 and 11BH-119 with the following material thickness measurement results (see asphalt core photographs located in Appendix B):

Table 5 – Existing Asphalt Pavement Core Measurements

Route	Description	Boring Designation	Asphalt Concrete (in)	Aggregate Base (in)	Cement-Treated Aggregate Base (in)
Route 29/250 Bypass	NB Mainline	11BH-002	6.0	--	9.5
Route 29/250 Bypass	NB Mainline	11BH-004	12.0	--	16.0
Route 29/250 Bypass	SB Shoulder	11BH-007	2.0	12.0	--
Route 29/250 Bypass	NB Shoulder	11BH-017	5.0	2.0	--
Route 29/250 Bypass	NB Mainline	11BH-021	10.5	4.0	8.0
Co Rd 657 - Lambs Road	NB Mainline	11BH-077	5.0	2.0	--
Route 29/250 Bypass	SB Mainline	11BH-119	12.6	10.0	--

8.2 Minimum Pavement Sections – Flexible and Rigid

ECS calculated the following minimum required pavement sections for Mainline US 29 Bypass, US 29 Bypass shoulders, Earlysville Road, Lambs Road, Woodburn Road, and Roslyn Ridge Road. The minimum pavement sections are shown in Tables 6, 7 and 8. All rigid pavement is to be continuously reinforced concrete pavement only.

Table 6 – Flexible Pavement Minimum Pavement Sections (Mainline)

		US 29 Western Bypass	Earlysville Road	Lambs Road	Woodburn Road	Roslyn Ridge Road
Description	**Type**	**Thickness (in)**				
Surface	SM-12.5A	--	2.0	2.0	2.0	2.0
	SMA-12.5 (76-22)	2.0	--	--	--	--
Intermediate	IM-19.0A	--	3.0	2.5	2.5	2.0
	SMA-19.0 (70-22)	2.0	--	--	--	--
Base	BM-25.0A	6.0	3.0	--	--	--
Subbase	21B	12.0	9.0	7.0	8.0	6.0
Total	--	22.0	17.0	11.5	12.5	10.0

Table 7 – Flexible Pavement Minimum Pavement Sections (Shoulder)

		US 29 Western Bypass	Earlysville Road
Description	**Type**	**Thickness (in)**	
Surface	SM-12.5A	2.0	2.0
Intermediate	IM-19.0A	2.0	2.0
Base	BM-25.0A	--	--
Subbase	Aggregate Base	18.0	12.0
Total	--	22.0	16.0

Based on our interpretation of the VDOT Road Design Manual, paved shoulders are not required for Lambs Road, Woodburn Road, and Roslyn Road since their average daily traffic is less than 2,000 vehicles per day. The mainline pavement structure should be extended 1 foot on the same slope in the aggregate shoulder. If future pavement widening is to be considered, the shoulders should have the same section as the mainline.

Table 8 – Rigid Pavement Minimum Pavement Sections (Mainline & Shoulder)

		US 29 Western Bypass (mainline)	US 29 Western Bypass (shoulder)
Description	**Type**	**Thickness (in)**	
CRCP Wide Lane (14 feet)	--	10.0	--
Surface	SM-12.5A	--	2.0
Intermediate	IM-19.0A	--	2.0
Subbase	21A	6.0	12.0
Total	--	16.0	16.0

The minimum pavement sections are being provided for design-build proposal preparation purposes only. The design-builder will be required to validate the adequacy of the minimum pavement sections and to notify the Department of its findings during the Scope Validation Period. If the selected design-builder confirms that the minimum pavement sections are inadequate for

actual design/construction conditions, it shall notify the Department during the Scope Validation Period of the necessary changes and proposed price adjustments, if any. Acceptable changes are limited to increasing the thickness of the base or subbase layers specified above. Any changes to the pavement sections specified above must be approved by the Department. The design-builder will be responsible for the final design and construction of the pavements for this project in accordance with the Contract Documents.

9.0 GEOTECHNICAL ENGINEERING CONSIDERATIONS DURING DESIGN AND CONSTRUCTION

9.1 Unsuitable Materials

For embankment fill, in cut areas to a depth of at least 3 feet below subgrade directly beneath and 2 feet beyond outer edge of pavement, and at least 2 feet beneath the bedding limits of minor structures, unsuitable materials are those with one or more of the following:

- Classify as CH, MH, OH and OL in accordance with the Unified Soil Classification System (USCS)
- Contain more than 5% by weight organic matter
- Has a swell greater than 5% as determined from testing in accordance with VTM-8.
- Exhibits strength, consolidation or any other characteristics deemed unsuitable by the design-builders geotechnical engineer and/or noted in the contract documents for use in the work.
- Is too wet for compaction of subgrade support.

Saturated and/or very loose to loose density coarse- and fine-grained soils that exhibit excessive pumping, weaving or rutting under the weight of the construction equipment are also considered unsuitable unless they can be conditioned through mechanical and/or chemical means to an acceptable moisture content that allows compaction to meet project specifications and classification and/or other testing indicates that they are not otherwise unsuitable. Fine-grained soils are defined as soils with more than 50% passing the No. 200 sieve and coarse-grained soils contain less than or equal to 50% passing the No. 200 sieve. Topsoil or other organic soils are unsuitable for use in embankment fills, but can be used as cover for slopes for the purpose of establishing vegetative cover. When used as cover for slopes, the thickness of topsoil shall not exceed 12 inches.

Unsuitable materials shall be disposed of at an approved disposal area or landfill licensed to receive such materials unless such materials can be used in “green areas” such as for flattening slopes, or can be adequately treated in-place through accepted and/or pre-approved methods of chemical and/or mechanical modification/stabilization to meet soil suitability, design and/or contract document requirements. All unsuitable materials shall be disposed off-site and/or treated in-place at no additional cost to the Department. Unsuitable materials and methods of treatment shall be identified on the plans and cross-sections. The design-builder’s qualified geotechnical engineer must provide justification for the selected treatment method(s) to verify that there will be no adverse effect on the performance of embankments, pavements, structures or drainage items. Justification for the design-builder’s proposed treatment methods shall be submitted to VDOT (Materials Division) for acceptance and/or pre-approval.

Visual-manual classification, laboratory testing based classification and CBR test results indicate that unsuitable soils exist at the project site at limited locations. Potentially unsuitable soils were

encountered in four of the forty-five borings at the locations and depths presented in Table 9:

Table 9 – Unsuitable Soils Encountered

Boring	Boring El.	Unsuitable Soil	Depth (ft)
11BH-055	473.3	MH	0.3 - 5.0
11BH-058	436.1	MH	0.3 - 12.0
11BH-088	544.3	MH	5.5 - 15.0
11BH-103	503.5	MH	0.3 - 2.0

The design-builder's qualified geotechnical engineer shall perform an inspection of all pavement subgrades and minor structure excavations immediately prior to placement of aggregate base, subbase or bedding materials. The purpose of such inspection is to indentify soft, loose or saturated soils that exhibit excessive pumping, weaving or rutting under the weight of the construction equipment. If the subgrade modulus (or k value) at any location along the proposed alignment is less than the design value, careful evaluation will be required to assess the need for subdividing the pavement section and/or localized undercut/stabilization.

9.2 Drainage Design and Construction

Any excavations for utilities and storm drains shall be backfilled in accordance with applicable sections of the current VDOT Road and Bridge Specifications and/or Standards and/or any applicable special provisions.

Edgedrains (UD-4) and underdrains (CD-1 and/or CD-2) will be required for all pavements on this project and shall be constructed in accordance with current VDOT Road & Bridge Standards.

10.0 LIMITATIONS

This report has been prepared to facilitate preparation of proposals for this project and should not be solely relied upon for the final design and construction of this project. A design level geotechnical investigation must be performed by the design-builder to verify and augment the information included in this report including those investigations specified by the Request for Proposals (RFP) during the Scope Validation Period. Reference should be made to the other Contract Documents, including the RFP and General Conditions provided with the RFP, for further information regarding required investigations and the identification, resolution and responsibility for differing site conditions.

The boring logs included in this report depict the subsurface soil, ground water, rock and existing pavement conditions at the specific locations where the borings were performed. These conditions may vary at other locations beyond, or between, these specific locations. Accordingly, the Department does not warrant or guarantee that the information provided on the logs, or in this report, can be projected as indicative of conditions beyond the limits of the borings, and any such projection is purely interpretive. In addition, the ground water levels recorded on the boring logs indicate the ground water conditions that existed at the time of the investigation. Ground water levels may vary considerably, with time, according to prevailing climate, rainfall, surface run-off, evaporation, construction and other factors.

The boring logs are made available to bidders in order that they may have access to subsurface data identical to that which is possessed by ECS, and are not intended as a substitute for personal

investigation, interpretation and judgment by others. Also, the information contained herein represents borings that were performed by the Department and may not represent all of the borings performed on the project, particularly if consultant designers performed work under self contained geotechnical/design contracts.

The minimum pavement sections and discussion of geotechnical considerations as presented in this report are based 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 subsequent site explorations and construction. The design-builder must perform additional subsurface exploration and laboratory testing to develop the design for this project and to meet the minimum requirements outlined in Chapter 3 of the current VDOT Material Division's Manual of Instructions and the current AASHTO Standard Specifications for the Design of Highway Bridges, 1996, 1997 and 1998 Interim Specifications.

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.

References:

1. Geologic Map of Virginia 1993, Commonwealth of Virginia, Department of Mines, Minerals and Energy, Division of Mineral Resources.

2. VDOT, Materials Division, Manual of Instructions, Chapter 3.

3. VDOT, Materials Division, Manual of Instructions, Chapter 6.

APPENDIX A

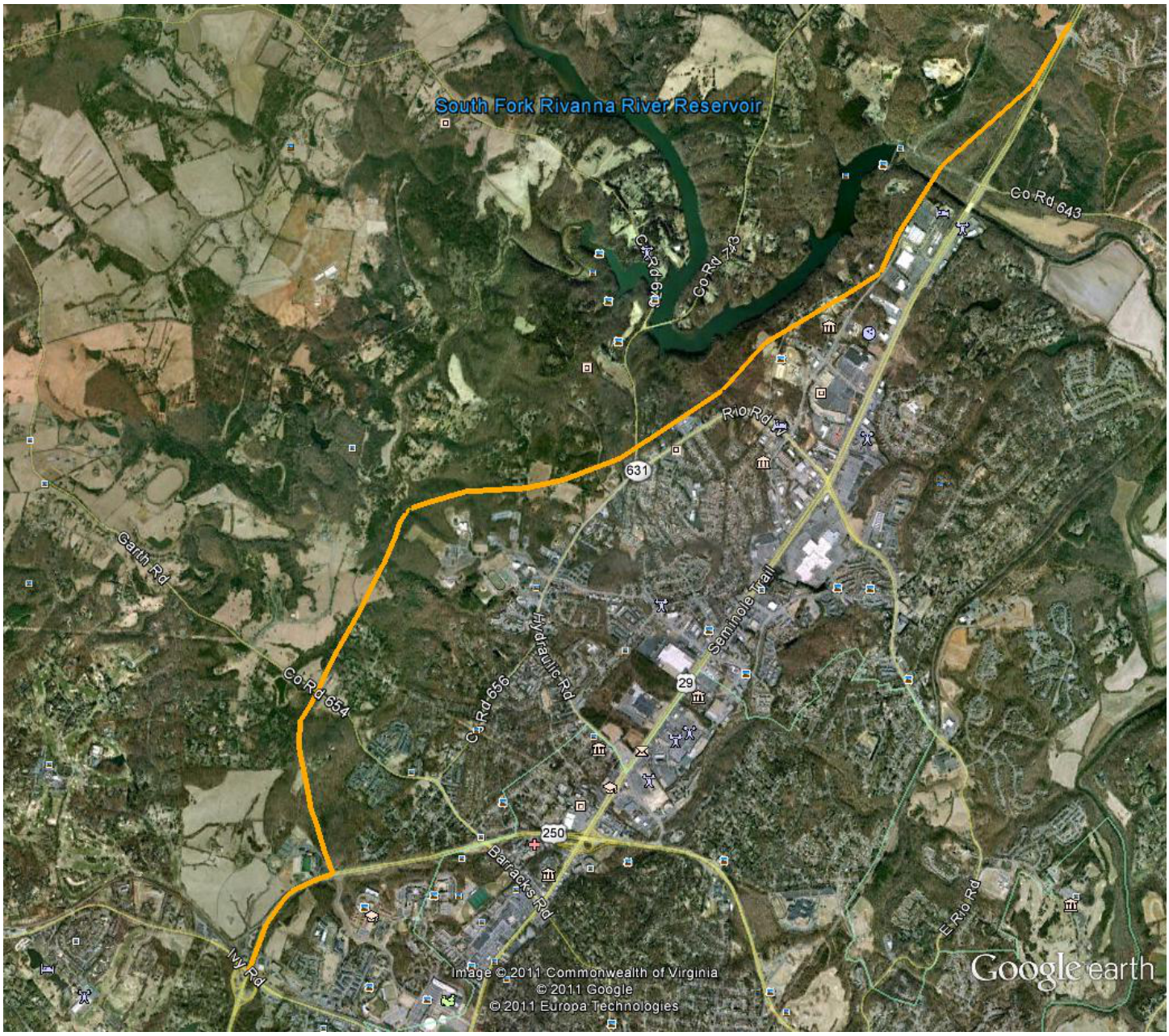
Aerial View of Project Area

APPENDIX B

Boring Logs (45 Logs)
Asphalt Core Photographs (7 Logs)
Rock Core Photographs (10 Logs)
Previous Borings:
- Hydraulic Road over Route 29 Bypass – 1997 (6 Logs)
- Route 29 Bypass Preliminary Soil Survey – 1997 (26 Logs)
- Route 29 Bypass over the South Fork of the Rivanna River Borings – 1997 (21 Logs)
- Route 250 Ramp A to NBL Route 29 Bypass Borings – 1997 (14 Logs)
- Route 29 Bypass over Route 250 Borings – 1997 (5 Logs)
- Old Ivy Road over Route 29-250 Bypass Borings – 1997 (6 Logs)
- CSX Railroad over Route 250 Bypass Borings – 1997 (3 Logs)
- Woodburn Road over Route 29 Bypass Borings – 1997 (6 Logs)
- Roslyn Ridge Road over Route 29 Bypass Borings – 1997 (6 Logs)
- Route 29 Bypass Stormwater Management Borings – 1997 (25 Logs)
- Stillhouse Mountain Tunnel Borings – 1996 (4 Logs)

APPENDIX C

Laboratory Test Summary (14 pages)
Atterberg Limits Test Reports (3 pages)
Standard Proctor Reports (5 pages)
California Bearing Ratio Reports (5 pages)



Google earth

miles 2

km 4

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-002
PAGE 1 OF 1

STATION: | OFFSET:
LATITUDE: 38.048254° N | LONGITUDE: 78.524676° W
SURFACE ELEVATION: 532.7 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 9/19/11 - 9/19/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: C. Giese

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		44 10 17 9	90		0.5						0.0 / 532.7 5.9" ASPHALT CONCRETE **ASPH**			
2	530				2.5						0.5 / 532.2 9.6" CEMENT-TREATED AGGREGATE **CTA**			
4		*	65		4.5						1.3 / 531.4 Red-brown, sandy SILT, contains quartz and rock fragments, very stiff, moist **ML** *Unable to perform SPT from 2.5-4.5 due to hammer malfunction. Pushed split-spoon to obtain soil sample.			
6		3 4 4 3	60		6.5						4.0 / 528.7 Red-brown, fine to medium poorly-graded SAND, contains quartz and rock fragments, loose, moist **SP**			
8	525	5 4 8 7	100		8.5						SAME, contains trace mica, medium dense			
10		5 8 14 12	100		10.5									
12	520													
14		18 31 32 22	90		14.5						15.0 / 517.7 Brown, sandy highly weathered GNEISS, contains trace mica, moist **HWR**			
16					16.5									
18 ▽	515													
20		100/3	67		19.5 19.8						SAME, no sand, with coarse gravel-sized rock fragments			
		100/1.5	200		20.8 20.9						Split-spoon refusal at 20.9' on 9-19-11			
22	510										20.9 / 511.8 Slightly weathered, very hard, slight jointing, light gray, GNEISS, intensly fractured from 24.7' to 25.0' **GNS**			
24						100	90							
26					26						Coring Terminated at 26.0' on 9-19-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 624,426.9
E: 3,273,792.6

PAGE 1 OF 1
11BH-002

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-004
PAGE 1 OF 1

STATION:
LATITUDE: 38.050863° N
SURFACE ELEVATION: 561.6 ft

OFFSET:
LONGITUDE: 78.523442° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
											0.0 / 561.6 12" ASPHALT CONCRETE **ASPH**			
2	560	48 50/3	100		1.7 2.5						1.0 / 560.6 16" CEMENT-TREATED AGGREGATE **CTA**			12.4
4		3 5 5 4	100		3 5						2.3 / 559.3 FILL, consisting of brown lean CLAY with sand, contains trace mica, stiff, moist **CL**			25.4
6	555	2 2 5 7	100		7						6.0 / 555.6 Gray, sandy SILT, contains trace mica, firm, moist **ML**			15.4
8		2 4 3 5	100		9						8.0 / 553.6 Gray, brown, lean CLAY, trace of sand, firm, moist **CL**			15.7
10		3 3 100/4	100		10.3						9.5 / 552.1 Brown, highly weathered GNEISS, trace of gravel, dry **HWR** Boring terminated at 10.3' on 9-30-11			7.1

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 625,377.0
E: 3,274,148.2

PAGE 1 OF 1
11BH-004

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-005
PAGE 1 OF 1

STATION:
LATITUDE: 38.051168° N
SURFACE ELEVATION: 560.7 ft

OFFSET:
LONGITUDE: 78.522679° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/23/11 - 9/23/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%) (SOIL)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION (ROCK)	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	560	1 2 3 2	55								0.0 / 560.7 3" TOPSOIL **TOPS**			20.5	
2	558	1 2 4 7	100		2						0.3 / 560.4 Brown, fine silty SAND, contains organics, loose, moist **SM** SAME, gray, no organics		NP	7.4	16.4
4	556	5 5 5 4	75		4						3.9 / 556.8 Gray, fine to medium poorly-graded SAND, trace of clay and gravel, medium dense, moist **SP**			10.9	
6					6						Boring terminated at 6.0' on 9-23-11				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 625,487.9
E: 3,274,469.9

PAGE 1 OF 1
11BH-005

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-007
PAGE 1 OF 1

STATION:
LATITUDE: 38.052713° N
SURFACE ELEVATION: 604.5 ft

OFFSET:
LONGITUDE: 78.522337° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	604	21 48 22 28	90		0.2						0.0 / 604.5 2" ASPHALT CONCRETE **ASPH**			
2	602	16 38 50 37	100		2.2						0.17 / 604.33 12" AGGREGATE BASE **GP**			6.9
4	600	14 20 25 21	100		4.2						1.17 / 603.33 Tan, highly weathered GNEISS, contains trace mica, moist **HWR** SAME, gray, dry			6.1
6					6.2						Boring terminated at 6.2' on 9-30-11			8.6

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 626,049.6
E: 3,274,368.0

PAGE 1 OF 1
11BH-007

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-008

STATION:
LATITUDE: 38.052109° N
SURFACE ELEVATION: 595.3 ft

OFFSET:
LONGITUDE: 78.521544° W
COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/23/11 - 9/23/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		2 3 3 3	100								0.0 / 595.3 4" TOPSOIL **TOPS**			21.1
2	594				2						0.3 / 595.0 Brown, fine poorly-graded SAND, contains rootlets, loose, moist **SP**			
		2 4 7 9	100								1.2 / 594.1 Red-brown, lean CLAY, trace of sand, stiff, moist **CL**			19.0
4	592				4						3.8 / 591.5 Red, white, fine clayey SAND, medium dense, moist **SC**			
		5 9 13 12	100								5.5 / 589.8 Gray, sandy SILT, very stiff, moist **ML**			5.1
6	590				6						Boring terminated at 6.0' on 9-23-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 625,830.3
E: 3,274,694.8

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-009
PAGE 1 OF 2

STATION: | OFFSET:
LATITUDE: 38.052987° N | LONGITUDE: 78.521214° W
SURFACE ELEVATION: 631.2 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 2/22/11 - 9/22/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		2 2 3 5	96								0.0 / 631.2 1" TOPSOIL **TOPS**			14.5
2	630	4 7 14 18	100		2						0.1 / 631.1 Red, fine to medium silty SAND, contains trace mica, loose, moist **SM** SAME, tan, medium dense			7.2
4		33 50/2	100		4 4.7						4.0 / 627.2 Tan, highly weathered GNEISS, contains highly weathered gneiss rock fragments, moist **HWR**			4.3
6	625	39 50/4	88		6 6.8									4.3
8		35 50/3	100		8 8.8									3.6
10														
12	620	100/5	100		13 13.4									6.8
14														
16	615													
18		12 15 12 15	100		18						18.0 / 613.2 Tan, red, fine silty SAND, contains trace mica, medium dense, moist **SM**			12.7
20	610				20									
22														
24		10 18 21 23	100		23 25						SAME, dense			16.7
26	605													
28		9 12 30 39	100		28									12.4
30														

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 626,150.2
E: 3,274,790.0

PAGE 1 OF 2
11BH-009

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-009
PAGE 2 OF 2

STATION:
LATITUDE: 38.052987° N
SURFACE ELEVATION: 631.2 ft

OFFSET:
LONGITUDE: 78.521214° W
COORD. DATUM: NAD 83

Date(s) Drilled: 2/22/11 - 9/22/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LAB DATA: LIQUID LIMIT (LL)	LAB DATA: PLASTICITY INDEX (PI)	LAB DATA: MOISTURE CONTENT (%)
					30									
	600													
32		100/1	0		32.8 32.9						Split-spoon refusal at 32.9' on 9-22-11			
34											32.9 / 598.3 Slightly weathered, hard, moderate jointing, gray, GNEISS **GNS**			
						98	80							
36	595													
38					37.9						Coring terminated at 37.9' on 9-22-11			
40														
	590													
42														

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 626,150.2
E: 3,274,790.0

PAGE 2 OF 2
11BH-009

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-012
PAGE 1 OF 1

STATION:
LATITUDE: 38.053211° N
SURFACE ELEVATION: 640.8 ft

OFFSET:
LONGITUDE: 78.519291° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/20/11 - 9/22/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 15.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	640	2 4 4 4	84								0.0 / 640.8 4" TOPSOIL **TOPS**			14.7
2		7 6 11 38	100		2						0.3 / 640.5 Brown and red, fine silty SAND, trace of clay, loose, moist **SM** SAME, medium dense			0.7
4		15 1 10 25	100		4						3.5 / 637.3 Black, gray, fine to coarse silty SAND, trace of gravel, medium dense, moist **SM**			10.9
6	635	4 7 8 13	100		6						4.0 / 636.8 Gray, brown, fine silty SAND, contains quartz fragments, medium dense, moist **SM**			14.2
8		20 50/3	100		8 8.8						8.0 / 632.8 Gray, brown, highly weathered GNEISS, contains quartz fragments, moist **HWR**			7.4
10	630													
12														
14		7 5 9 12	84		13 15						13.0 / 627.8 Gray, brown, fine silty SAND, contains quartz fragments, medium dense, moist **SM**			16.5
16	625													
18		2 3 9 8	100		18 20									16.5
20	620													
22														
24		3 6 6 6	100		23 25						SAME, red Boring terminated at 25.0' on 9-25-11.			29.4

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 626,231.7
E: 3,275,343.7

PAGE 1 OF 1
11BH-012

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-016
PAGE 1 OF 1

STATION:
LATITUDE: 38.054364° N
SURFACE ELEVATION: 559.0 ft

OFFSET:
LONGITUDE: 78.515293° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	558	1 0 1 2	90								0.0 / 559.0 5" TOPSOIL **TOPS**			14.5
2		2			2						0.4 / 558.6 Tan, SILT with sand, contains trace mica, very soft, moist **ML**			
	556	22 50/6	93		3.5						1.5 / 557.5 Orange, lean CLAY with sand, contains trace mica, soft, moist **CL**			5.3
4		33			4						2.5 / 556.5 Gray, highly weathered GNEISS, contains trace mica and rock fragments, dry **HWR**			
	554	50 50/4	100		5.3						Boring terminated at 5.3' on 10-3-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 626,651.2
E: 3,276,495.1

PAGE 1 OF 1
11BH-016

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-017
PAGE 1 OF 1

STATION:
LATITUDE: 38.055223° N
SURFACE ELEVATION: 586.5 ft

OFFSET:
LONGITUDE: 78.514857° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °: STRATA	DIP °: JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	586	5 7 5 6	90		0.5						0.0 / 586.5 5.5" ASPHALT CONCRETE **ASPH**			
2	584	3 5 5 8	100		2.5						0.46 / 586.04 2" AGGREGATE BASE **GP**			20.0
4	582	6 5 5 9	80		4.5						0.63 / 585.87 Brown, sandy SILT, contains trace mica and clay lenses, stiff, moist **ML**			18.0
6					6.5						Boring terminated at 6.5' on 9-30-11			11.8

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 626,964.1
E: 3,276,620.8

PAGE 1 OF 1
11BH-017

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-020
PAGE 1 OF 1

STATION:
LATITUDE: 38.055575° N
SURFACE ELEVATION: 520.8 ft

OFFSET:
LONGITUDE: 78.511167° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	520	1 1 19 8	60								0.0 / 520.8 2" TOPSOIL **TOPS**			18.5
2	518	4 4 4 5	65		2						0.2 / 520.6 FILL, consisting of orange, SILT with gravel, contains trace mica, very stiff, moist **ML** SAME, firm			12.0
4	516	7 10 9 7	90		4						4.0 / 516.8 Gray, fine silty SAND, contains clay lenses, medium dense, moist **SM**			10.3
6					6						Boring terminated at 6.0' on 10-3-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 627,092.3
E: 3,277,680.3

PAGE 1 OF 1
11BH-020

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-021
PAGE 1 OF 1

STATION:
LATITUDE: 38.055908° N
SURFACE ELEVATION: 531.6 ft

OFFSET:
LONGITUDE: 78.509508° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
											0.0 / 531.6 10.5" ASPHALT CONCRETE **ASPH**			
2	530	15 73 7 4	80		0.9						0.88 / 530.72 4" AGGREGATE BASE **GP**			13.5
4	528	4 5 6 8	100		2.9						1.21 / 530.39 8" CEMENT-TREATED AGGREGATE **CTA**			18.1
6	526	4 5 7 10	100		4.9						1.88 / 529.72 Brown, sandy SILT, stiff, moist **ML**			12.1
					6.9						4.9 / 526.7 Tan, fine to medium silty SAND, contains trace mica, medium dense, moist **SM**			
											Boring terminated at 6.9' on 9-30-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 627,213.6
E: 3,277,683.3

PAGE 1 OF 1
11BH-021

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-028
PAGE 1 OF 1

STATION:
LATITUDE: 38.059986° N
SURFACE ELEVATION: 627.9 ft

OFFSET:
LONGITUDE: 78.519406° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 4 9 20	85								0.0 / 627.9 1" TOPSOIL **TOPS**			5.4
2	626	36 50/2	100		2 2.7						0.1 / 627.8 Red-brown, sandy lean CLAY, contains trace mica, firm, moist **CL**			6.7
4	624	100/3	67		4 4.3						1.0 / 626.9 Gray, fine to medium silty SAND, medium dense, moist **SM**			
6	622	100/1	100		6 6.1						2.3 / 625.6 Gray, highly weathered GNEISS, moist **HWR**			
8	620	100/2	100		8 8.2						Split-spoon refusal at 8.2' on 10-4-11			
10	618													

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 628,699.1
E: 3,275,311.2

PAGE 1 OF 1
11BH-028

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-030
PAGE 1 OF 1

STATION: OFFSET:
LATITUDE: 38.062191° N LONGITUDE: 78.520092° W
SURFACE ELEVATION: 716.6 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		2 1 3 7	95								0.0 / 716.6 3" TOPSOIL **TOPS**			13.3
2	715	5 15 28 50/5	100		2						0.3 / 716.3 Red-brown, lean CLAY, trace of sand, contains trace mica, soft, moist **CL**			6.2
4		23 85 15/1	100		3.9 4 5.1						2.5 / 714.1 Orange, sandy SILT, contains trace mica, hard, dry **ML**			
6	710	100	100		6 6.5						3.5 / 713.1 Gray, highly weathered GNEISS, dry **HWR**			
8		100/3	100		8 8.3 9						Auger refusal at 9.0' on 10-3-11			
10											9.0 / 707.6 Slightly weathered to unweathered, soft to moderately hard, highly to moderately fractured, gray, GNEISS **GNS**			
12	705					100	66							
14					14						14.0 / 702.6 Slightly weathered to unweathered, soft to moderately hard, highly fractured, gray, GNEISS **GNS**			
16	700					100	70							
18					19						Coring terminated at 19.0' on 10-3-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 629,502.2
E: 3,275,113.9

PAGE 1 OF 1
11BH-030

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-032
PAGE 1 OF 1

STATION:
LATITUDE: 38.062727° N
SURFACE ELEVATION: 754.7 ft

OFFSET:
LONGITUDE: 78.519433° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		2 2 3 2	85								0.0 / 754.7 3" TOPSOIL **TOPS**			
2		3 7 13 35	100		2						0.3 / 754.4 Brown, sandy lean CLAY, contains trace mica, firm, moist **CL** SAME, very stiff			15.4 8.1
4	750	100/5	100		4 4.4						3.5 / 751.2 Gray, fine to medium silty SAND, contains clay lenses, dense, moist **SM**			
6		100/5	100		6 6.4						4.0 / 750.7 Gray, highly weathered GNEISS, moist **HWR**			
8		100	100		8 8.5									
10	745													
12														
14		100	100		13 13.5									
16	740													
18		90 10/1	100		18 18.6									
20	735													
22														
24		70 30/3	100		23 23.8									
26	730													
28		100/4	100		28 28.3						Boring terminated at 28.3' on 10-3-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 629,697.3
E: 3,275,303.6

PAGE 1 OF 1
11BH-032

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-033
PAGE 1 OF 1

STATION:
LATITUDE: 38.064042° N
SURFACE ELEVATION: 682.1 ft

OFFSET:
LONGITUDE: 78.520158° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND / SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		4 11 8 7	100	0.2 – 2.2						0.0 / 682.1 2" ASPHALT CONCRETE **ASPH** 0.17 / 681.93 2" AGGREGATE BASE **GP**			11.7	
2	680	4 4 3 5	100	2.2 – 4.2						0.33 / 681.77 FILL, consisting of orange, SILT, trace sand, very stiff, moist **ML** 2.0 / 680.1 2" CRUSHED AGGREGATE **GP**	24	9	9.9	35.6
4		6 13 14 19	100	4.2 – 7						2.2 / 679.9 Red-brown, fine to medium silty SAND, contains trace mica and clay lenses, loose, moist **SM**			8.8	
6	675	11 21 24 24	100	7 – 9						SAME, medium dense SAME, dense			9.2	
8		8 15 13 13	100	9 – 11						SAME, medium dense			11.4	
10				11										
12	670													
14		15 25 33 50	100	14 – 16						SAME, very dense			7.7	
16				16										
18	665	70 30/3	100	19 – 19.8						18.0 / 664.1 Gray, highly weathered GNEISS, moist **HWR**				
20														
22	660													
24		60 40/4	100	24 – 24.8						Boring terminated at 24.8' on 10-4-11				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 630,176.1
E: 3,275,095.0

PAGE 1 OF 1
11BH-033

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-035
PAGE 1 OF 1

STATION:
LATITUDE: 38.066728° N
SURFACE ELEVATION: 569.1 ft

OFFSET:
LONGITUDE: 78.519529° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	568	2 4 6 2	75								0.0 / 569.1 3" TOPSOIL **TOPS**			14.8
2		6 2			2						0.3 / 568.8 Red, lean CLAY, trace of sand, stiff, moist **CL**			
	566	18 26	100											6.0
4		8 50/5	92		4 4.9						SAME, very stiff			
	564										4.5 / 564.6 Gray, yellow, and brown, highly weathered GNEISS, contains trace mica, moist **HWR**			
6		50/5	105		6 6.4									
	562													
8		40 50/5	83		8 8.9									
	560										Boring terminated at 8.9' on 9-29-11.			
10														

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 631,154.4
E: 3,275,276.2

PAGE 1 OF 1
11BH-035

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-037
PAGE 1 OF 1

STATION:
LATITUDE: 38.070237° N
SURFACE ELEVATION: 534.3 ft

OFFSET:
LONGITUDE: 78.516983° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	534	1 2 2 4	88								0.0 / 534.3 5" TOPSOIL **TOPS**			35.4
2	532	3 4 5 6	100		2						0.4 / 533.9 Red-brown, lean CLAY, trace of sand, contains trace mica, soft, moist **CL** SAME, stiff			30.9
4	530	3 4 5 6	100		4									
6					6						4.8 / 529.5 Orange, SILT, trace of sand, contains trace mica, stiff, moist **ML** Boring terminated at 6.0' on 9-29-11			17.6

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 632,426.3
E: 3,276,003.9

PAGE 1 OF 1
11BH-037

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-038

STATION:
LATITUDE: 38.071200° N
SURFACE ELEVATION: 479.5 ft

OFFSET:
LONGITUDE: 78.516816° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 12.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 2 1 2	100								0.0 / 479.5 4" TOPSOIL **TOPS**			26.8	
2		2 1 2 2	75		2						0.3 / 479.2 Red-brown, sandy SILT, contains trace mica, soft, moist **ML**	37	2	31.8	56.2
4	475	2 2 1 2	34		4									32.3	
6		3 5 6 5	59		6						6.0 / 473.5 Gray, red, and brown, SILT, trace of sand, contains trace mica, stiff, moist **ML**			20.5	
8		7 6 25 50/4	100		8						SAME, hard			11.2	
10	470				9.8						9.5 / 470.0 Gray, white, and black, highly weathered GNEISS, contains trace mica, moist **HWR**				
12		50/4 50/1	100 100		13 13.3 13.4 13.5						SAME, wet Split-spoon refusal at 13.5' on 9-28-11				

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 632,782.6
E: 3,276,057.6

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-041
PAGE 1 OF 1

STATION:
LATITUDE: 38.072616° N
SURFACE ELEVATION: 472.6 ft

OFFSET:
LONGITUDE: 78.515788° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 14.5 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		2 3 2 2	59		2						0.0 / 472.6 5" TOPSOIL **TOPS**			20.3	
2	470	2 2 5 3	75		4						0.4 / 472.2 Red-brown, fine to coarse silty SAND, loose, moist **SM**			13.1	
4		2 2 2 2	75		6						SAME, very loose	26	4	19.0	42.7
6		7 7 3 4	25		8						SAME, loose			18.4	
8	465	10 12 18 23	100		10						8.0 / 464.6 Yellow-brown, SILT, trace of sand, contains trace mica, very stiff, moist **ML**			16.8	
12	460	50/6	100		13 13.5						12.0 / 460.6 Yellow-brown, highly weathered GNEISS, contains trace mica, wet **HWR**				
14															
16															
18	455	50/1	100		18 18.1						Split-spoon refusal at 18.1' on 9-28-11.				

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 633,298.6
E: 3,276,057.6

PAGE 1 OF 1
11BH-041

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-043
PAGE 1 OF 1

STATION:
LATITUDE: 38.073283° N
SURFACE ELEVATION: 462.4 ft

OFFSET:
LONGITUDE: 78.515123° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	462	3 2 3 1	75								0.0 / 462.4 4" TOPSOIL **TOPS**			29.0
2	460	2 4 12 50/3	83		2						0.3 / 462.1 Red-brown, lean CLAY, trace of sand, firm, moist **CL** SAME, very stiff			13.4
4	458	50/6	50		3.8 4 4.5						3.5 / 458.9 Gray, highly weathered GNEISS, contains trace mica, moist **HWR**			
6		50/0			6						Split-spoon refusal at 6.0' ON 9-28-11.			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 633,541.3
E: 3,276,545.3

PAGE 1 OF 1
11BH-043

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-044
PAGE 1 OF 1

STATION:
LATITUDE: 38.073377° N
SURFACE ELEVATION: 457.1 ft

OFFSET:
LONGITUDE: 78.514608° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °: STRATA	DIP °: JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 2 1 2	75		2						0.0 / 457.1 3" TOPSOIL **TOPS**			27.9
2	455	2 1 5 6	25		4						0.3 / 456.8 Red-brown, lean CLAY, trace of sand, soft, moist **CL** SAME, contains highly weathered gneiss rock fragments, firm			13.7
4		7 13 8 12	42		6						SAME, very stiff			13.7
6		2 4 20 40	59		8									4.2
8	450	50/4	110		8.3						7.0 / 450.1 Gray, yellow, and brown, SILT, trace of sand, very stiff, moist **ML** 8.0 / 449.1 Gray, highly weathered GNEISS, moist **HWR**			
10		50/1	100		11 11.1						Split-spoon refusal at 11.1' on 9-28-11.			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 633,575.4
E: 3,276,693.5

PAGE 1 OF 1
11BH-044

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-050
PAGE 1 OF 2

STATION: OFFSET:
LATITUDE: 38.076486° N LONGITUDE: 78.513269° W
SURFACE ELEVATION: 465.7 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/26/11 - 9/26/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
FIRST ENCOUNTERED AT 28.5 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	465	1 1 2 3	100								0.0 / 465.7 4" TOPSOIL **TOPS**			27.5	
2		2 3 5 5	100		2						0.3 / 465.4 Red-brown, fine silty SAND, contains trace mica, very loose, moist **SM** SAME, loose			27.7	
4		2 3 4 4	100		4						SAME, orange		NP	18.7	45.2
6	460	4 6 6 5	100		6						SAME, medium dense			16.5	
8		4 5 5 5	100		8						SAME, loose			17.8	
10	455				10										
12															
14		5 6 8 10	100		13 15						SAME, medium dense			18.9	
16	450														
18		8 11 11 15	100		18						SAME, brown			16.1	
20	445				20										
22															
24		4 8 13 15	100		23 25									19.5	
26	440														
28		17 50/5	100		28 28.9						28.0 / 437.7 Gray, highly weathered GNEISS, moist **HWR**				
30		100/1	100		29.7										

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 634,707.7
E: 3,277,079.1

PAGE 1 OF 2
11BH-050

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-050
PAGE 2 OF 2

STATION:
OFFSET:
LATITUDE: 38.076486° N
LONGITUDE: 78.513269° W
SURFACE ELEVATION: 465.7 ft
COORD. DATUM: NAD 83

Date(s) Drilled: 9/26/11 - 9/26/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
FIRST ENCOUNTERED AT 28.5 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	435				29.8						Split-spoon refusal at 29.8' on 9-26-11				
32						90	63				29.8 / 435.9 Slightly weathered to unweathered, hard, highly fractured, gray, GNEISS, intensely fractured from 32.2' to 33.2' **GNS**				
34					34.8						Coring terminated at 34.8' on 9-26-11				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 634,707.7
E: 3,277,079.1

PAGE 2 OF 2
11BH-050

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-051
PAGE 1 OF 1

STATION:
LATITUDE: 38.076489° N
SURFACE ELEVATION: 442.4 ft

OFFSET:
LONGITUDE: 78.512867° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/26/11 - 9/26/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 7.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		WOH 1 1 3	59								32.8
2	440	3 4 3 3	21	2							10.6
4		7 12 13 37	42	4							8.2
6		22 27 26 26	100	6							6.6
8	435	17 22 26 27	100	8							10.1
10				10							
12	430			13							
14		14 43 50/2	100	14.2							
16				14.5							
18	425			19.5	100	100					

FIELD DESCRIPTION OF STRATA

0.0 / 442.4
4" TOPSOIL **TOPS**

0.3 / 442.1
Brown, SILT, trace of sand, contains trace rootlets, very soft, moist **ML**

3.5 / 438.9
Tan, brown, fine to coarse poorly-graded SAND, trace of silt, contains highly weathered gneiss rock fragments, medium dense, moist **SP**
SAME, contains quartz fragments

SAME, contains trace mica, very dense

SAME, tan

14.0 / 428.4
Tan, highly weathered GNEISS, moist **HWR**
Augered from 14.2' to auger refusal at 14.5'

14.5 / 427.9
Slightly weathered, very hard, very wide jointing, gray, GNEISS **GNS**

Coring terminated at 19.5' on 9-26-11

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 634,708.8
E: 3,277,194.9

PAGE 1 OF 1
11BH-051

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-054
PAGE 1 OF 1

STATION:
LATITUDE: 38.077244° N
SURFACE ELEVATION: 425.2 ft

OFFSET:
LONGITUDE: 78.512807° W
COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/27/11 - 9/27/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	425	1 0 1 2	84								0.0 / 425.2 4" TOPSOIL **TOPS**	32	8	20.8	60.6
2		1 50/6	67		2 3						0.3 / 424.9 Red-brown, sandy SILT, very soft, moist **ML**				
4		16 32 50/4	100		4 5.3						2.5 / 422.7 Gray, highly weathered GNEISS, moist **HWR** SAME, contains trace mica				
6	420	100/1	100		6 6.1 6.4						Augered from 6.1' to auger refusal at 6.4' 6.4 / 418.8 Slightly weathered to moderately weathered, hard, highly to moderately jointed, gray, GNEISS, highly fractured zone from 9.4' to 9.9' **GNS**				
8						100	79								
10	415				9.9						9.9 / 415.3 Highly weathered, moderately hard, moderate jointing, brown to gray, GNEISS, intensly fractured from 11.0' to 11.6' and 12.7' to 13.0', no recovery from 13.0' to 14.9'** **GNS**				
12						62	25								
14					14.9						14.9 / 410.3 Slightly weathered, hard, moderate to high jointing, gray, GNEISS, no recovery from 14.9' to 16.3'**, quartz lens from 16.3' to 17.8', highly fractured zone from 19.4' to 19.9' **GNS**				
16	410														
18						72	42								
					19.9						Coring terminated at 19.9' on 9-27-11				

REMARKS: Rig Type: Diedrich D-50. **No recovery due to grinding up of highly fractured rock zones with coring equipment.
Boring backfilled upon completion.
N: 634,983.8
E: 3,277,212.3

PAGE 1 OF 1
11BH-054

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-055
PAGE 1 OF 2

STATION:
LATITUDE: 38.077661° N
SURFACE ELEVATION: 473.3 ft

OFFSET:
LONGITUDE: 78.512217° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/27/11 - 9/27/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 45.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 3 2 3	84								0.0 / 473.3 4" TOPSOIL **TOPS**			19.9	
2		3 4 4 7	88		2						0.3 / 473.0 Red-brown, elastic SILT, trace of sand, firm, moist **MH** SAME, contains trace mica			26.0	
4	470	5 6 7 7	84		4									18.4	
6		3 5 7 5	84		6						5.0 / 468.3 Gray, brown, and red, fine poorly-graded SAND, trace of silt, contains trace mica, medium dense, moist **SP**			14.1	
8	465	3 4 3 3	100		8						6.0 / 467.3 Tan and red, fine silty SAND, contains trace mica, medium dense, moist **SM**				
10					10						8.3 / 465.0 Tan and red, sandy SILT, contains trace mica, firm, moist **ML**		NP	15.2	65.3
12															
14	460	7 8 9 9	100		13 15						SAME, yellow and brown, very stiff			14.0	
16															
18	455	5 9 14 20	100		18 20									11.3	
22															
24	450	10 18 28 22	100		23 25						SAME, hard			14.9	
26															
28	445	10 10 12 11	100		28									19.4	
30											29.0 / 444.3				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 635,135.5
E: 3,277,382.0

PAGE 1 OF 2
11BH-055

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-055
PAGE 2 OF 2

STATION:
LATITUDE: 38.077661° N
SURFACE ELEVATION: 473.3 ft

OFFSET:
LONGITUDE: 78.512217° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/27/11 - 9/27/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 45.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
					30						Yellow, brown, fine to medium silty SAND, contains trace mica, medium dense, moist **SM**				
32															
	440	13 31 50/6	100		33 – 34.5						33.5 / 439.8 Yellow, brown, highly weathered GNEISS, contains trace mica, moist **HWR**				
34															
36															
38	435	18 30 50/6	100		38 – 39.5										
40															
42															
	430	29 50/4	100		43 – 43.8										
44															
46		100/1	100		46.2 – 46.3						Split-spoon refusal at 46.3' on 9-27-11				
48	425					99	97				46.3 / 427.0 Slightly weathered, hard, moderate jointing, gray, GNEISS **GNS**				
50															
					51.3						Coring terminated at 51.3' on 9-27-11				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 635,135.5
E: 3,277,382.0

PAGE 2 OF 2
11BH-055

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-058

STATION:
LATITUDE: 38.078366° N
SURFACE ELEVATION: 436.1 ft

OFFSET:
LONGITUDE: 78.512098° W
COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 2 2 2	79								0.0 / 436.1 4" TOPSOIL **TOPS**				
2	435	2 3 3 6	100		2						0.3 / 435.8 Red-brown, elastic SILT, trace of sand, contains trace rootlets, soft, moist **MH**			16.0	
4		4 5 7 9	100		4						SAME, contains trace mica, no rootlets, firm			21.3	
6	430	3 8 7 9	100		6						SAME, stiff			19.9	
8		4 4 6 9	100		8						SAME, sandy			17.3	
10					10									19.7	
12	425	1 1 0 1	100		13						12.0 / 424.1 Red-brown, fine silty SAND, contains trace mica, very loose, wet **SM**	24	2	21.9	46.5
14					15										
16	420														
18		1 3 11 13	88		18									20.7	
20					20						19.0 / 417.1 Gray, yellow, and brown, SILT, trace of sand, stiff, moist **ML**				
22	415														
24		23 32 30 50/5	83		23 24.9						23.0 / 413.1 Gray, yellow, and brown, highly weathered GNEISS, contains trace mica, moist **HWR**			13.5	
26	410														
28		11 22 24 31	100		28									13.1	
30															

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 635,392.4
E: 3,277,416.2

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-058
PAGE 2 OF 2

STATION:
LATITUDE: 38.078366° N
SURFACE ELEVATION: 436.1 ft

OFFSET:
LONGITUDE: 78.512098° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
					30										
	405														
32															
		24 100/4	100		33										
34					33.8										
36	400														
		100/2	100		37.3										
					37.5						Split-spoon refusal at 37.5' on 9-28-11.				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 635,392.4
E: 3,277,416.2

PAGE 2 OF 2
11BH-058

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-059

STATION:
LATITUDE: 38.078578° N
SURFACE ELEVATION: 485.1 ft

OFFSET:
LONGITUDE: 78.511439° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 1 2 2	88								0.0 / 485.1 4" TOPSOIL **TOPS**	37	8	36.3	62.0
2		2 29 42 40	100		2						0.3 / 484.8 Red-brown, sandy SILT, soft, moist **ML**			10.2	
4		6 21 50/5	100		4 5.4						3.0 / 482.1 Gray, highly weathered GNEISS, moist **HWR**			11.6	
6	480	40 50/3	100		6 6.8									8.9	
8		50/5	100		8 8.4									6.3	
10	475														
12															
14		43 50/3	100		13 13.8						SAME, contains trace mica			7.0	
16	470														
18		8 7 8 9	100		18						17.0 / 468.1 Gray, yellow, and brown, fine to medium silty SAND, contains trace mica, medium dense, moist **SM**			21.7	
20	465				20										
22															
24		6 8 12 11	100		23 25									23.8	
26	460														
28		50/5	100		28 28.4						27.0 / 458.1 Gray, highly weathered GNEISS, contains quartz fragments, moist **HWR**				
30															

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 635,469.4
E: 3,277,606.0

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-059
PAGE 2 OF 2

STATION:
LATITUDE: 38.078578° N
SURFACE ELEVATION: 485.1 ft

OFFSET:
LONGITUDE: 78.511439° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/11 - 9/28/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA											LAB DATA			
		SOIL				ROCK								
								DIP °						
DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	STRATA LEGEND	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32		100/1	100		33									
					33.1									
34					34									
	450													
36						100	95							
38														
					39									

FIELD DESCRIPTION OF STRATA

SAME, contains trace mica
Augered from 33.1' to auger refusal at 34.0'

34.0 / 451.1
Slightly weathered, very hard, moderate jointing, gray, GNEISS **GNS**

Coring terminated at 39.0' on 9-28-11

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 635,469.4
E: 3,277,606.0

PAGE 2 OF 2
11BH-059

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-065
PAGE 1 OF 1

STATION:
LATITUDE: 38.080565° N
SURFACE ELEVATION: 524.8 ft

OFFSET:
LONGITUDE: 78.508986° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 2 2 4	92								0.0 / 524.8 2" TOPSOIL **TOPS**			21.8
2		4 7 12 22	100		2						0.2 / 524.6 Tan, SILT with sand, contains trace mica, soft, moist **ML**			
4	520	11 15 21 26	100		4						1.4 / 523.4 Red-brown, lean CLAY with sand, contains trace mica, stiff, moist **CL**			8.0
6		18 27 31 42	100		6						3.0 / 521.8 Gray, sandy SILT, contains trace mica and clay lenses, hard, moist **ML**			9.4
8		17 38 31 42	100		8						SAME, very hard			7.7
10	515				10						8.0 / 516.8 Gray, highly weathered GNEISS, moist **HWR**			7.8
12														
14		60 40/4	100		13 13.8									8.1
16	510													
18		8 13 15 21	100		18						17.0 / 507.8 Gray, sandy SILT, contains trace mica and clay lenses, very stiff, moist **ML**			13.4
20	505				20									
22		100/4	100		23 23.3						22.0 / 502.8 Gray, highly weathered GNEISS, moist **HWR**			
24	500													
26		100/2	100		26.5 26.7						Boring terminated at 26.7' on 10-4-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 636,193.1
E: 3,278,312.1

PAGE 1 OF 1
11BH-065

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-069
PAGE 1 OF 1

STATION:
LATITUDE: 38.081139° N
SURFACE ELEVATION: 519.2 ft

OFFSET:
LONGITUDE: 78.506114° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		2 1 6 8	84		2						0.0 / 519.2 4" TOPSOIL **TOPS**			11.6
2		8 8 6 6	100		4						0.3 / 518.9 Red-brown, fine clayey SAND, loose, moist **SC**			25.8
4	515	5 10 29 50/5	79		5.9						2.5 / 516.7 Red-brown, lean CLAY, trace of sand, stiff, moist **CL**			4.8
6		24 100/5	100		6 6.9						4.6 / 514.6 Tan, fine to medium silty SAND, dense, dry **SM**			
8		100/4	100		8 8.3						5.5 / 513.7 Gray, highly weathered GNEISS, moist **HWR**			
	510													
10														
12														
		100/1	100		13 13.1						Boring terminated at 13.1' on 10-4-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 636,401.8
E: 3,279,139.1

PAGE 1 OF 1
11BH-069

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-070
PAGE 1 OF 1

STATION:
LATITUDE: 38.081753° N
SURFACE ELEVATION: 444.0 ft

OFFSET:
LONGITUDE: 78.505773° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		2 1 4 10	75								0.0 / 444.0 4" TOPSOIL **TOPS**			11.2
2	442	6 8 12 23	59		2						0.3 / 443.7 Brown, yellow, fine silty SAND, loose, moist **SM** SAME, contains quartz fragments, medium dense			14.6
4	440	100/7	13		4 4.6 4.7						4.0 / 440.0 Brown, gray, highly weathered GNEISS, moist **HWR**			
6	438	32 27 17 17 100/3	59 57		6.7 7						SAME, dry Auger refusal at 7.0' on 10-4-11			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 636,625.7
E: 3,279,237.2

PAGE 1 OF 1
11BH-070

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-071
PAGE 1 OF 1

STATION:
LATITUDE: 38.081416° N
SURFACE ELEVATION: 465.2 ft

OFFSET:
LONGITUDE: 78.504966° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	465	2 3 5 8	42								0.0 / 465.2 3" TOPSOIL **TOPS**			5.5
2		12 15 20 25	100		2						0.3 / 464.9 Brown, medium to coarse poorly-graded SAND with gravel, trace of silt, loose, moist **SP**			7.1
4		36 64	100		4 5						2.0 / 463.2 Brown, gray, fine to medium silty SAND with gravel, dense, moist **SM**			3.4
	460										4.0 / 461.2 Gray, highly weathered GNEISS, dry **HWR**			
6		100/5	100		6 6.4						SAME, brown, gray			
8		100/3	100		8 8.3									
10	455													
12														
14		100/6	0		13 13.5						SAME, contains highly weathered gneiss rock fragments			
16	450													
18		50/1	100		18 18.1									
20	445													
22		50/1	100		23 23.1									
24	440													
26														
28		100/3	27		28 28.3						Auger refusal at 28.3' on 10-4-11			
30														

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 636,502.9
E: 3,279,469.4

PAGE 1 OF 1
11BH-071

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-073
PAGE 1 OF 1

STATION:
LATITUDE: 38.081172° N
SURFACE ELEVATION: 527.3 ft

OFFSET:
LONGITUDE: 78.503288° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/4/11 - 10/4/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 2 2 4	50								0.0 / 527.3 2" TOPSOIL **TOPS**			14.6
2	525	2 5 6 12	100		2						0.2 / 527.1 FILL, consisting of tan, medium poorly-graded SAND, trace of silt, very loose, moist **SP**			11.1
4		12 35 40 18	100		4						1.0 / 526.3 Red-brown, fine to medium silty SAND, medium dense, moist **SM**			4.4
6		21 41 46 36	100		6						4.0 / 523.3 White and gray, highly weathered GNEISS, contains quartz fragments, dry **HWR**			10.9
8	520	13 87	100		8 9						SAME, white, gray, and red, moist **QZT**			13.6
10														
12	515	100/2	0		13 13.2						Split-spoon refusal at 13.2' on 10-4-11			
14														

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 636,413.9
E: 3,279,952.5

PAGE 1 OF 1
11BH-073

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-077
PAGE 1 OF 2

STATION: OFFSET:
LATITUDE: 38.081686° N LONGITUDE: 78.500383° W
SURFACE ELEVATION: 551.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
FIRST ENCOUNTERED AT 2.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND / SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	550	4 5 3	100	0.4						0.0 / 551.0 5" ASPHALT CONCRETE **ASPH**				
2		3 5 5 7	92	1.9 2						0.42 / 550.58 2" AGGREGATE BASE **GP**			23.9	
4		3 4 4 3	100	4						0.58 / 550.42 Red-brown, lean CLAY, trace of sand, firm, moist **CL** SAME, sandy, stiff			26.9	
6	545	3 5 7 7	100	6						4.5 / 546.5 Tan, fine to medium silty SAND, loose, moist **SM**			18.6	
8		2 3 4 4	100	8						5.2 / 545.8 Red-brown, sandy lean CLAY, firm, moist **CL** SAME, trace sand, stiff			23.2	
10				10						8.0 / 543.0 Tan, fine silty SAND, contains trace mica, loose, moist **SM**		NP	16.3	36.0
	540													
12														
14		8 11 11 14	100	13 15						SAME, gray, medium dense			13.3	
16	535													
18		8 14 13 17	100	18 20									19.5	
	530													
22		50/6	100	23 23.5						22.0 / 529.0 Gray, highly weathered GNEISS, moist **HWR**				
24														
26	525													
28		50/5	100	28 28.4										
30														

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 636,601.2
E: 3,280,788.6

PAGE 1 OF 2
11BH-077

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-077
PAGE 2 OF 2

STATION:
OFFSET:
LATITUDE: 38.081686° N
LONGITUDE: 78.500383° W
SURFACE ELEVATION: 551.0 ft
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
FIRST ENCOUNTERED AT 2.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	520														
32															
		100/1	100		33 33.1										
34															
36	515														
38		100/0			38						Split-spoon refusal at 38.0' on 9-29-11 38.0 / 513.0 Slightly weathered to unweathered, hard, highly fractured, gray GNEISS **GNS**				
40						100	76								
	510														
42															
					43						Coring terminated at 43.0' on 9-29-11				

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 636,601.2
E: 3,280,788.6

PAGE 2 OF 2
11BH-077

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-080
PAGE 1 OF 1

STATION:
LATITUDE: 38.082181° N
SURFACE ELEVATION: 504.6 ft

OFFSET:
LONGITUDE: 78.497161° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
FIRST ENCOUNTERED AT 4.5 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											0.0 / 504.6 3" TOPSOIL **TOPS**				
2		2 2 1 9	59		2						0.3 / 504.3 Brown, medium to coarse clayey SAND, very loose, moist **SC**			21.5	
4	500	6 2 1 1	13		4						SAME, contains trace mica, wet			28.2	
6		2 2 2 3	67		6						5.0 / 499.6 Red-brown, SILT, trace of sand, contains trace mica, soft, wet **ML**			66.4	
8		2 2 2 3	100		8						SAME, orange, red-brown, and yellow		NP	81.2	91.7
10	495	2 2 2 3	100		10									70.5	
12															
14	490	2 3 4 6	100		13 15						SAME, black, red-brown, and yellow, firm			74.2	
											Boring terminated at 15.0' on 10-3-11				

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion
N: 636,781.4
E: 3,281,716.0

PAGE 1 OF 1
11BH-080

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-083
PAGE 1 OF 2

STATION:
LATITUDE: 38.083673° N
SURFACE ELEVATION: 610.2 ft

OFFSET:
LONGITUDE: 78.492274° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
FIRST ENCOUNTERED AT 48.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	610	1 0 1 3	75								0.0 / 610.2 4" TOPSOIL **TOPS**			12.7
2		4 5 5 7	100		2						0.3 / 609.9 Tan, sandy lean CLAY, very soft, moist **CL**			
4		5 7 9 11	100		4						SAME, red-brown, trace of gravel, contains trace mica, stiff			20.2
6	605	5 16 11 10	100		6						SAME, very stiff			21.4
8		3 4 5 6	100		8						6.5 / 603.7 Orange, sandy SILT, trace of gravel, contains trace mica, very stiff, moist **ML**			9.3
10	600				10						SAME, with gravel, stiff			16.1
12														
14		6 12 19 21	100		13 15						SAME, hard			14.5
16	595													
18		8 11 13 12	100		18						17.0 / 593.2 Gray, sandy SILT, contains trace mica, very stiff, moist **ML**			17.0
20	590				20									
22														
24		9 18 21 24	100		23 25						SAME, hard			11.0
26	585													
28		8 12 14 15	100		28						SAME, very stiff			17.7
30														

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 637,324.9
E: 3,283,122.7

PAGE 1 OF 2
11BH-083

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-083
PAGE 2 OF 2

STATION:
LATITUDE: 38.083673° N
SURFACE ELEVATION: 610.2 ft

OFFSET:
LONGITUDE: 78.492274° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: S. Crouch

GROUND WATER
FIRST ENCOUNTERED AT 48.0 ft DEPTH
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	580				30									
32														
		13 16 23 31	100		33 35						SAME, hard			13.2
34														
	575													
36														
38		17 40 50/4	100		38 39.3						38.3 / 571.9 Gray, highly weathered GNEISS, contains trace mica, dry **HWR**			
40	570													
42														
44		23 18 50/6	100		43 44.5									
	565													
46														
48		100/5	100		48 48.4									
50	560													
52														
		100/1	100		53 53.1						Boring terminated at 53.1' on 9-29-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 637,324.9
E: 3,283,122.7

PAGE 2 OF 2
11BH-083

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-088
PAGE 1 OF 1

STATION:
LATITUDE: 38.088148° N
SURFACE ELEVATION: 544.3 ft

OFFSET:
LONGITUDE: 78.483586° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 3 4 6	63								0.0 / 544.3 6" TOPSOIL **TOPS**			33.2	
2		4 4 6 8	84		2						0.5 / 543.8 Red, lean CLAY, trace of sand, firm, moist **CL**				
4	540	4 9 11 18	75		4						SAME, stiff			33.0	
6		11 23 18 18	100		6						SAME, very stiff			20.4	
8		8 8 10 10	100		8						5.5 / 538.8 Red-brown and yellow, elastic SILT, trace of sand, hard, moist **MH**	59	22	33.4	85.2
10	535				10						SAME, with sand, contains trace mica, very stiff			34.2	
12															
14	530	7 9 12 14	100		13 15									29.2	
											Boring terminated at 15.0' on 10-3-11				

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 638,979.9
E: 3,285,623.5

PAGE 1 OF 1
11BH-088

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-089
PAGE 1 OF 1

STATION:
LATITUDE: 38.088464° N
SURFACE ELEVATION: 493.2 ft

OFFSET:
LONGITUDE: 78.482711° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/3/11 - 10/3/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	493	1									0.0 / 493.2 12" TOPSOIL **TOPS**			
	492	1 100/6	100								1.0 / 492.2 Yellow, brown, highly weathered GNEISS, contains quartz fragments, moist **HWR**			
2	491	100/3	100		1.5 2 2.3						Auger refusal at 3.1' on 10-3-11			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 639,070.2
E: 3,285,875.2

PAGE 1 OF 1
11BH-089

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-094
PAGE 1 OF 1

STATION:
LATITUDE: 38.091550° N
SURFACE ELEVATION: 547.4 ft

OFFSET:
LONGITUDE: 78.480305° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		4 4 4 2	59								0.0 / 547.4 3" TOPSOIL **TOPS**			12.2
2	545	3 2 4 6	75		2						0.3 / 547.1 Red-brown, fine to medium silty SAND, contains quartz fragments, loose, moist **SM**			17.4
4		2 5 13 16	59		4									18.8
6		11 16 21 26	100		6						5.0 / 542.4 Pink, brown, SILT, trace of sand, contains trace mica and highly weathered granite rock fragments, very stiff, moist **ML**			11.7
8	540	3 7 9 11	100		8						SAME, hard			21.6
10					10						8.5 / 538.9 Gray, fine to medium silty SAND, contains trace mica and highly weathered granite rock fragments, medium dense, moist **SM**			
12	535	50/0			13						Split-spoon refusal at 13.0' on 9-29-11			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 640,194.0
E: 3,286,567.5

PAGE 1 OF 1
11BH-094

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-099
PAGE 1 OF 1

STATION:
LATITUDE: 38.095005° N
SURFACE ELEVATION: 551.2 ft

OFFSET:
LONGITUDE: 78.471679° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/11 - 9/29/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
											0.0 / 551.2 3" TOPSOIL **TOPS**			
	550	2 2 2 5	25								0.3 / 550.9 Red, SILT, trace of sand, contains trace mica, soft, moist **ML**			41.7
2		3 3 6 12	100		2						SAME, stiff			19.2
4	548	7 14 16 18	100		4						SAME, yellow, and red, contains highly weathered granite rock fragments, very stiff			21.7
6	546	12 14 22 50/5	100		6						SAME, hard			9.9
8	544	15 17 22 27	100		7.9 8						SAME, gray			8.2
10	542				10						Boring terminated at 10.0' on 9-29-01			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 641,452.9
E: 3,289,049.9

PAGE 1 OF 1
11BH-099

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-101
PAGE 1 OF 1

STATION: OFFSET:
LATITUDE: 38.096439° N LONGITUDE: 78.469231° W
SURFACE ELEVATION: 510.4 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	510	3 3 4 4	67								0.0 / 510.4 3" TOPSOIL **TOPS**			25.7
2		4 5 8 11	100		2						0.3 / 510.1 Red-brown, SILT, trace of sand, firm, moist **ML**			
4		4 5 8 20	100		4						SAME, stiff			19.1
6	505	11 12 10 11	100		6						SAME, trace of gravel, contains trace mica			14.7
8		6 8 10 14	100		8						SAME, no gravel, very stiff			16.5
10	500				10						SAME, yellow, brown, red, with sand			11.7
12														
14		9 13 24 24	75		13 15						SAME, contains quartz fragments, hard			3.3
16	495													
18		11 12 14 15	100		18 20						SAME, very stiff			11.2
20											Boring terminated at 20.0' on 9-30-11			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 641,975.4
E: 3,289,754.2

PAGE 1 OF 1
11BH-101

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-103

STATION:
LATITUDE: 38.097074° N
SURFACE ELEVATION: 503.5 ft

OFFSET:
LONGITUDE: 78.468822° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		2 3 3 5	100								0.0 / 503.5 3" TOPSOIL **TOPS**	68	32	29.5	77.9
2		4 6 13 30	100		2						0.3 / 503.2 Red, elastic SILT with sand, contains trace mica, firm, moist **MH**			10.8	
4	500	9 35 30 25	100		4						2.0 / 501.5 Yellow, brown, red, SILT with sand, contains trace mica, very stiff, moist **ML**			7.5	
6		7 8 11 12	100		6						SAME, very hard			7.3	
8	495	4 7 8 9	100		8						SAME, very stiff			10.7	
10					10						SAME, stiff				
12															
14	490	12 14 20 30	100		13 15						SAME, contains highly weathered gneiss rock fragments, hard			11.9	
16															
18	485	12 14 24 30	100		18									6.9	
20					20										
22															
24	480	17 34 50 50/5	100		23 24.9						23.0 / 480.5 Gray, yellow, brown, highly weathered GNEISS, contains trace mica, moist **HWR**				
											Boring terminated at 24.9' on 9-30-11				

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 642,206.7
E: 3,289,872.0

SPT_LOGB:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-104
PAGE 1 OF 1

STATION: | OFFSET:
LATITUDE: 38.097725° N | LONGITUDE: 78.468246° W
SURFACE ELEVATION: 489.1 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 2 2 2	75								0.0 / 489.1 3" TOPSOIL **TOPS**			17.2
2		4 5 5 6	100		2						0.3 / 488.8 Brown, lean CLAY, trace of sand, contains trace rootlets, soft, moist **CL**			22.9
4	485	5 5 7 8	100		4						2.0 / 487.1 Red, SILT, trace of sand, contains trace mica, stiff, moist **ML**			14.8
6		6 10 9 13	67		6						SAME, with sand			15.1
8	480	4 7 9 11	100		8						SAME, very stiff			19.3
10					10						SAME, contains quartz fragments			
12														
14	475	6 7 6 7	100		13 15						SAME, no quartz fragments, stiff			14.9
16														
18	470	6 8 9 10	100		18 20						SAME, gray, contains highly weathered gneiss rock fragments, very stiff			17.4
20														
22														
24	465	5 6 8 10	100		23 25						SAME, stiff			35.4
											Boring terminated at 25.0' on 9-30-11			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 642,443.8
E: 3,290,037.6

PAGE 1 OF 1
11BH-104

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-106
PAGE 1 OF 1

STATION:
LATITUDE: 38.099441° N
SURFACE ELEVATION: 496.8 ft

OFFSET:
LONGITUDE: 78.467812° W
COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/11 - 9/30/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	496	2 6 8 4	59								0.0 / 496.8 4" TOPSOIL **TOPS**			16.4
2					2						0.3 / 496.5 Red-brown, lean CLAY, trace of sand, contains trace rootlets, stiff, moist **CL**			
	494	4 3 8 10	42								SAME, contains quartz fragments			16.9
4					4						4.0 / 492.8 Red-brown, SILT with sand, contains trace mica, stiff, moist **ML**			
	492	4 6 8 10	75											15.6
6					6									
	490	5 8 11 17	100								SAME, very stiff			27.5
8					8									
	488	4 11 14 18	100								SAME, gray, trace of sand			11.0
10					10						Boring terminated at 10.0' on 9-30-11			

REMARKS: Rig Type: CME 45C. Boring backfilled upon completion.
N: 643,068.9
E: 3,290,162.3

PAGE 1 OF 1
11BH-106

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-119

STATION:
LATITUDE: 38.113693° N
SURFACE ELEVATION: 473.2 ft

OFFSET:
LONGITUDE: 78.452600° W
COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 10/5/11 - 10/5/11
Drilling Method(s): 3.25" HSA
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	472	20 10 5	79		1						0.0 / 473.2 12.6" ASPHALT CONCRETE **ASPH**			
2											1.05 / 472.15 9.9" AGGREGATE BASE **GP**			23.5
	470	100/7 5	42		3 3.6						1.88 / 471.32 Red, lean CLAY, trace of sand, contains trace mica, stiff, moist **CL**			
4											3.2 / 470.0 Yellow, gray, and brown, highly weathered METASANDSTONE, contains quartz fragments, moist **HWR** Auger refusal at 3.6' on 10-5-11			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 648,261.0
E: 3,294,537.6

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-124
PAGE 1 OF 2

STATION: | OFFSET:
LATITUDE: 38.106964° N | LONGITUDE: 78.457290° W
SURFACE ELEVATION: 442.5 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/11 - 10/5/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 4 4 9	88								0.0 / 442.5 3" TOPSOIL **TOPS**			23.6
2	440	6 19 23 25	100		2						0.3 / 442.2 Brown, red, lean CLAY, trace of sand, contains trace rootlets, firm, moist **CL** SAME, hard			20.4
4		12 20 33 44	100		4						4.0 / 438.5 Red-brown, green, and gray, SILT, trace of sand, very hard, moist **ML**			18.3
6		17 22 27 31	100		6						SAME, hard			17.8
8	435	17 43 57	100		8 9.5						7.5 / 435.0 Green, gray, and red-brown, highly weathered METASANDSTONE, moist **HWR**			18.2
10														
12	430	16 40 60/5	100		13 14.4						SAME, contains highly weathered metasandstone rock fragments			
16														
18	425	20 37 63/5	100		18 19.4						SAME, contains trace mica			
20														
22	420	27 73/5	100		23 23.9									
24														
26														
28	415	18 82/5	100		28 28.9									
30														

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 645,809.7
E: 3,293,189.0

PAGE 1 OF 2
11BH-124

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0029-002-844, PE101
LOCATION: Rt. 29 Bypass - Charlottesville, VA
STRUCTURE:

11BH-124
PAGE 2 OF 2

STATION:
LATITUDE: 38.106964° N
SURFACE ELEVATION: 442.5 ft

OFFSET:
LONGITUDE: 78.457290° W
COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/11 - 10/5/11
Drilling Method(s): 3.25" HSA / NQ Wireline
SPT Method: Automatic Hammer
Other Test(s):
Driller: CONNELLY & ASSOCIATES
Logger: B. Jasion

GROUND WATER
NOT ENCOUNTERED DURING DRILLING
NO LONG TERM MEASUREMENTS TAKEN

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LAB DATA: LIQUID LIMIT (LL)	LAB DATA: PLASTICITY INDEX (PI)	LAB DATA: MOISTURE CONTENT (%)
32	410	100/5	63		33 33.4						SAME, gray			
34														
36														
38	405	100/3	83		38 38.3						SAME, dry			
40					40						Auger refusal at 40.0' on 10.5-11			
42	400					97	82				40.0 / 402.5 Moderately weathered, moderately hard, high jointing, dark gray to gray, METASANDSTONE, intensly fractured from 42.9' to 43.5' **MSST**			
44					45						Coring Terminated at 45.0' on 10-5-1			

REMARKS: Rig Type: Diedrich D-50. Boring backfilled upon completion.
N: 645,809.7
E: 3,293,189.0

PAGE 2 OF 2
11BH-124

SPT_LOG:36-1061 RT 29 BYPASS - CHARLOTTESVILLE.GPJ:8.30.002:021011:11/7/11

Copyright 2011, Commonwealth of Virginia

Asphalt Core Sample Photos
VDOT Project 0029-002-844 (UPC 102419)
Route 29 Western Bypass
Charlottesville, Virginia ECS# 36:1061

Asphalt: 6”

Cement –Treated Aggregate: 9.6”

11BH-002 (US 29 Bypass – NB Mainline)

Asphalt Core Sample Photos
VDOT Project 0029-002-844 (UPC 102419)
Route 29 Western Bypass
Charlottesville, Virginia ECS# 36:1061

Asphalt: 12”

Cement - Treated Aggregate: 16”

11BH-004 (US 29 Bypass – NB Mainline)

Asphalt: 2”

Aggregate Base: 12”

11BH-007 (US 29 Bypass – SB Shoulder)

Asphalt Core Sample Photos
VDOT Project 0029-002-844 (UPC 102419)
Route 29 Western Bypass
Charlottesville, Virginia

ECS# 36:1061

Asphalt: 5.5”

Aggregate Base: 2”

11BH-017 (US 29 Bypass – NB Shoulder)

Asphalt: 10.5”

Aggregate Base: 4”
Cement – Treated Aggregate: 8”

11BH-021 (US 29 Bypass – NB Mainline)

Asphalt Core Sample Photos
VDOT Project 0029-002-844 (UPC 102419)
Route 29 Western Bypass
Charlottesville, Virginia

ECS# 36:1061

Asphalt: 5”

Aggregate Base: 2”

11BH-077 (Co Rd 657 Lambs Road - NB Mainline)

Asphalt: 12.6”

Aggregate Base 9.9”

11BH-119 (US 29 – SB Mainline)

VDOT Project 0029-002-844
11BH-002 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

Box 1 of 1

VDOT Project 0029-002-844
11BH-009 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

Box 1 of 1

VDOT Project 0029-002-844
11BH-030 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

Run	From	To	Length	Recovery %	RQD%
1	9.0	14.0	5.0	100	66
2	14.0	19.0	5.0	100	70

Box 1 of 2

VDOT Project 0029-002-844
11BH-030 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

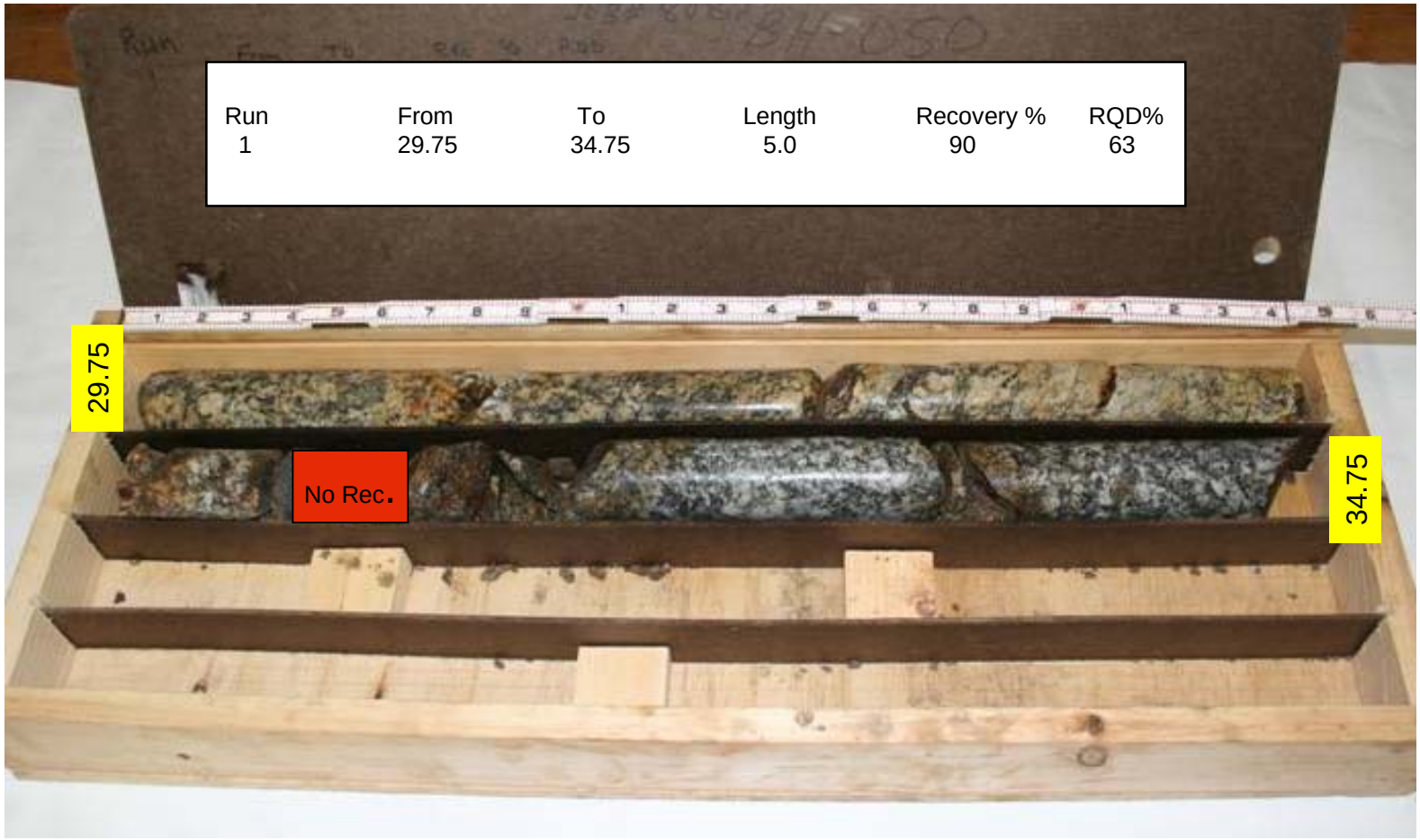
(UPC 102419)
ECS# 36:1061

Box 2 of 2

VDOT Project 0029-002-844
11BH-050 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061



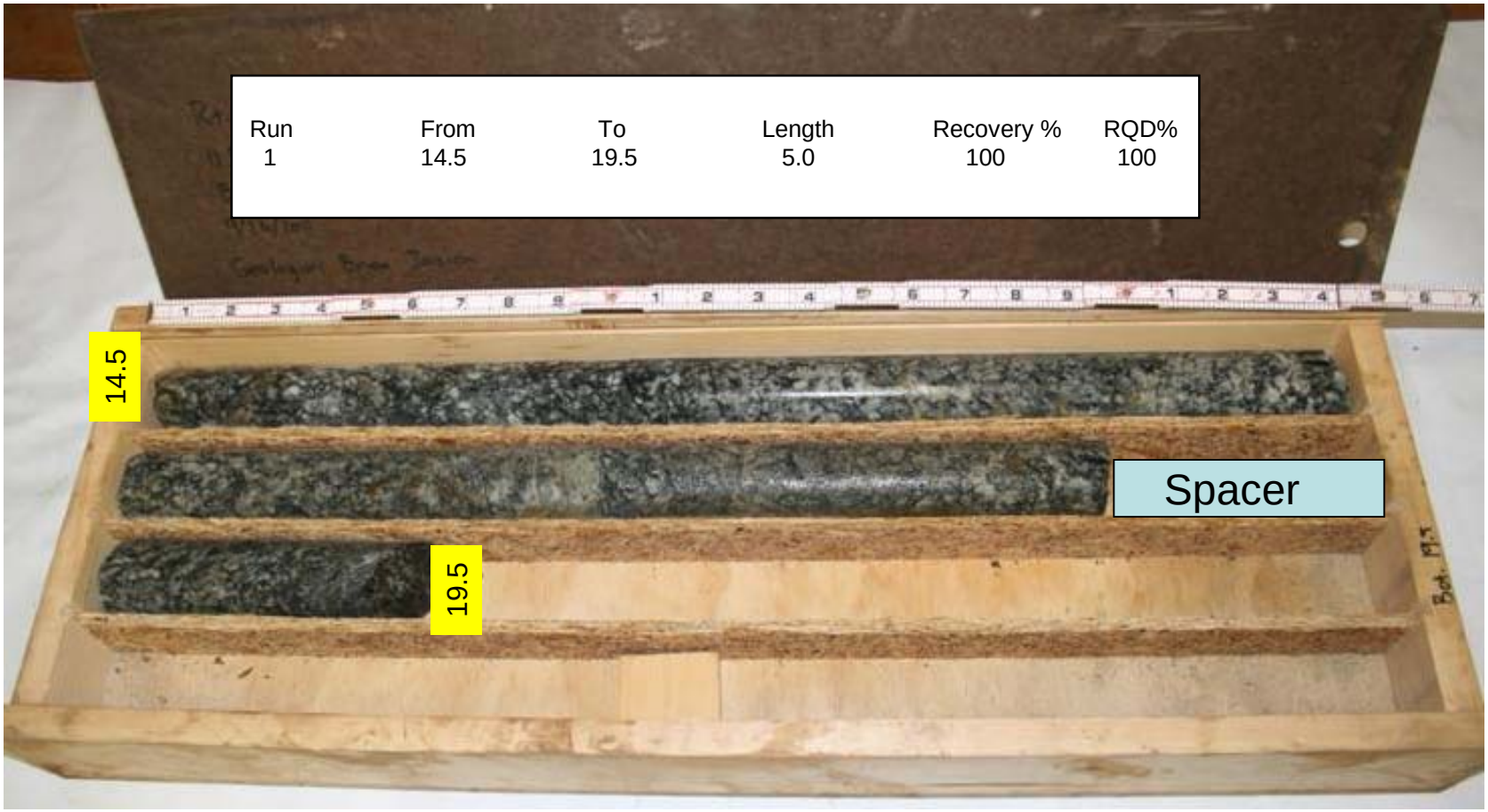
Run	From	To	Length	Recovery %	RQD%
1	29.75	34.75	5.0	90	63

Box 1 of 1

VDOT Project 0029-002-844
11BH-051 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061



Box 1 of 1

VDOT Project 0029-002-844
11BH-054 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

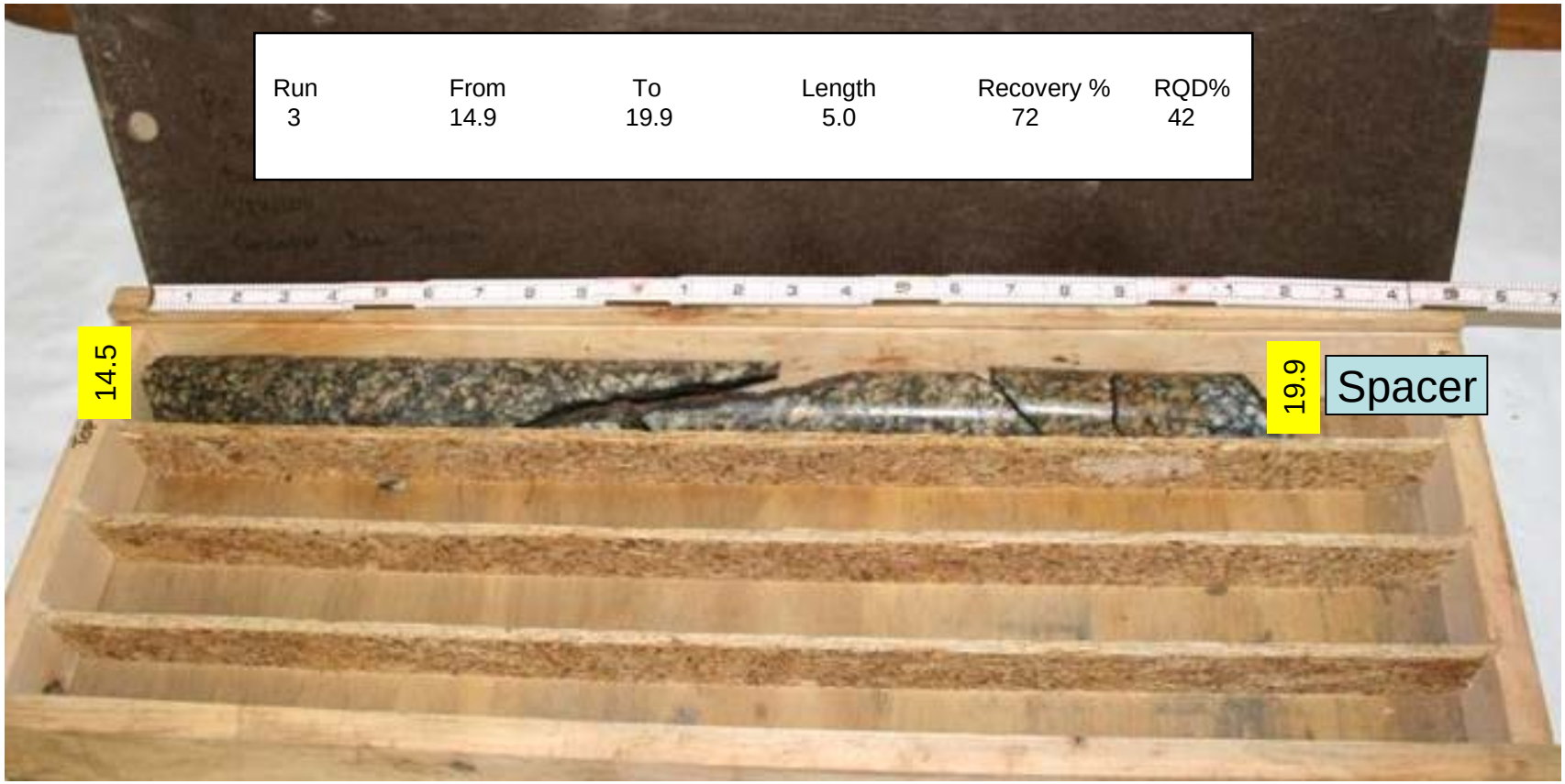
Run	From	To	Length	Recovery %	RQD%
1	6.4	9.9	3.5	100	79
2	9.9	14.9	5.0	62	25
3	14.9	19.9	5.0	72	42

Box 1 of 2

VDOT Project 0029-002-844
11BH-054 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

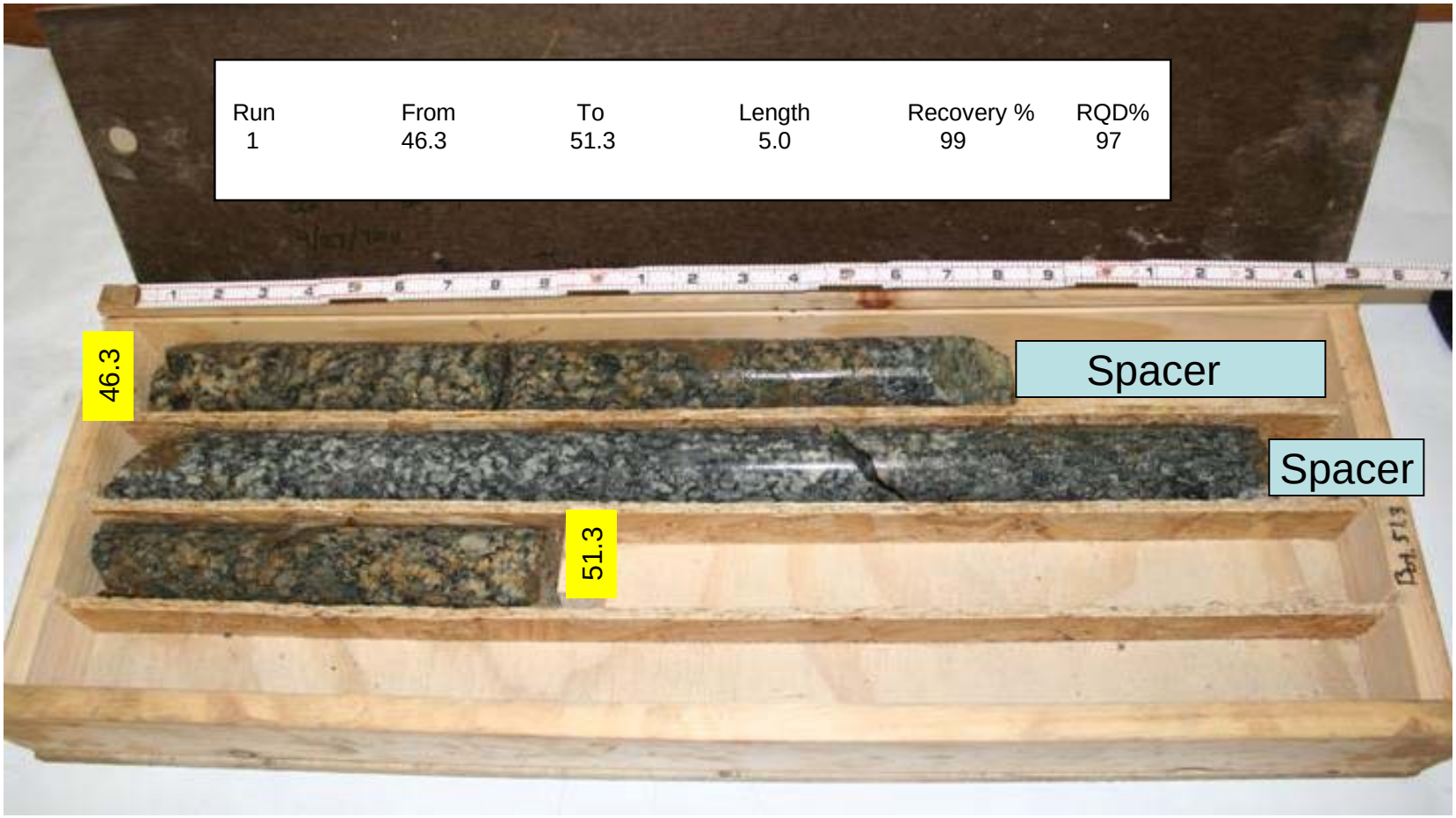


Box 2 of 2

VDOT Project 0029-002-844
11BH-055 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061



Box 1 of 1

VDOT Project 0029-002-844
11BH-059 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

Box 1 of 1

VDOT Project 0029-002-844
11BH-077 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061

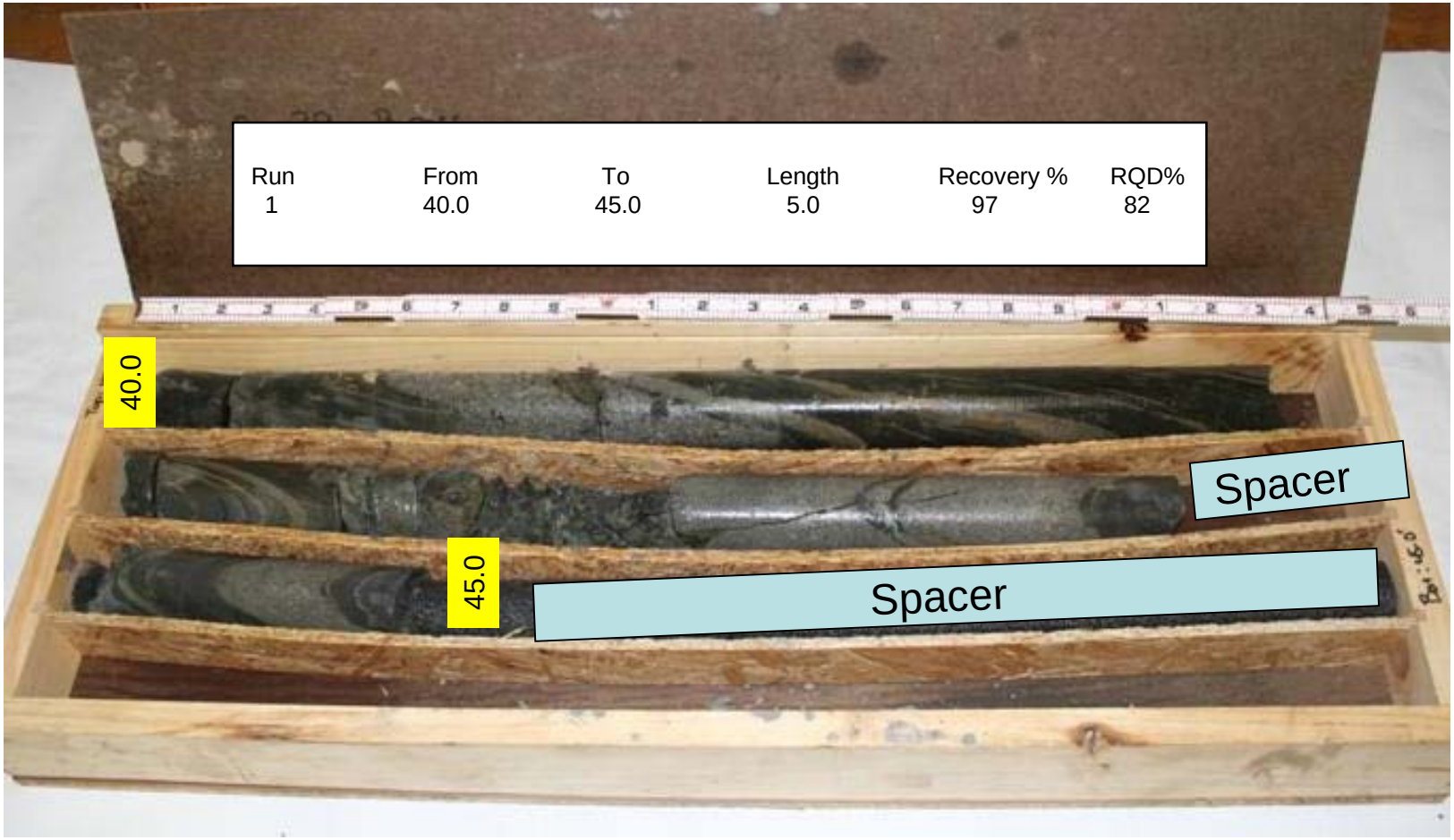
Run	From	To	Length	Recovery %	RQD%
1	38.0	43.0	5.0	100	76

Box 1 of 1

VDOT Project 0029-002-844
11BH-124 Rock Core

Route 29 Western Bypass
Charlottesville, Virginia

(UPC 102419)
ECS# 36:1061



Box 1 of 1

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: H-1 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B630

BORING LOCATION: Station 11+78, 7m lt., Hydraulic Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 177.47 Meters

STREAM / ROAD CROSSING Hydraulic Road over proposed Bypass

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 11-12-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: BK-51, hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STATA DEPTHS (Meters)	STATA ELEVA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	177.47	TOPSOIL	0.00						
0.15	177.32	Yellow-brown SILT, some gravel and sand, trace of clay		0.46	177.01	2-2-3	0.18		
0.80	176.67	Reddish-tan Clayey SILT, trace of sand	0.76	1.22	176.71 176.25	6-7-9	0.24		
1.50	175.97	Yellow-brown Silty fine SAND	1.52	1.98	175.95 175.49	9-8-10	0.30		
2.29	175.18	Reddish-tan SILT with gray veins, some graveland sand	2.29	2.74	175.18 174.73	6-8-9	0.37		
3.05	174.42	Brown SILT with gray veins, some coarse to fine sand	3.05	3.51	174.42 173.96	5-5-6	0.37		
4.57	172.90	Mixed gray and tan Silty fine to medium SAND, trace of gravel and coarse sand	4.57	5.03	172.90 172.44	11-12-15	0.40		
			6.10	6.55	171.37 170.92	16-13-17	0.37		
7.62	169.85	Mixed gray and yellow-brown Silty fine to coarse SAND	7.62	7.92	169.85 169.55	30-50/.15	0.27		
		(decomposed to highly weathered quartz monzanite)	9.14	9.23	168.33 168.24	50/.06	0.06		
10.67	166.80	AUGER REFUSAL	10.67	10.67	166.80	50/0	0.00		

UNABLE TO PENETRATE @ 10.67 METERS

GROUNDWATER DEPTH: 6.03 Meters CAVE-IN DEPTH: 8.29 Meters GROUNDWATER ELEVATION: 171.44 @ 11-13-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: H-2 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B630

BORING LOCATION: Station 11+92, 7m rt., Hydraulic Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 174.81 Meters

STREAM / ROAD CROSSING Hydraulic Road over proposed Bypass

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 11-11-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: BK-51, hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	174.81	Miscellaneous FILL? (dark grayish-brown Silty fine SAND)	0.00	0.46	174.35	2-3-3	0.24		
			0.76		174.05				
1.07	173.74	Mixed gray and brown Silty SAND, some clay (fill?)				3-3-3	0.30		
1.22	173.59	Grayish-yellow Sandy SILT		1.22	173.59				
			1.52	1.98	173.29 / 172.83	2-2-2	0.46		
2.29	172.52	Mixed gray and yellow fine to coarse Silty SAND, some weathered rock fragments	2.29	2.74	172.52 / 172.07	6-7-9	0.37		
			3.05	3.51	171.76 / 171.30	11-9-12	0.46		
4.57	170.24	Gray fine to coarse SAND, some silt (decomposed quartz monzanite)	4.57	4.72	170.24 / 170.09	50/.15	0.15		
			6.10	6.55	168.71 / 168.26	29-34-50	0.30		
			7.62	7.92	167.19 / 166.89	48-50/.15	0.30		
			9.14	9.42	165.67 / 165.39	45-50/.122	0.15		
9.42	165.39	Bottom of boring @ 9.42 meters							

GROUNDWATER DEPTH: 4.33 Meters CAVE-IN DEPTH: 7.77 Meters GROUNDWATER ELEVATION: 170.48 @ 11-12-97

GROUNDWATER DEPTH: 4.42 Meters CAVE-IN DEPTH: 7.89 Meters GROUNDWATER ELEVATION: 170.39 @ 11-13-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B630

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Hydraulic Road over proposed Bypass

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: BK-51,hollow-stem augers, manual hammer

BORING NO: H-3 PAGE 1

BORING LOCATION: Station 12+17, 14.5m lt., Hydraulic Rd. Const. B/L

BORING ELEVATION: 176.94 Meters

SUBSTRUCTURE UNIT: Pier

DATE DRILLED: 11-12-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NX

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	176.94	TOPSOIL	0.00	0.00						
0.09	176.85	Graybrown SILT, some sand, trace rock fragments and mica			0.46	176.48	2-4-3	0.18		
0.61	176.33	Mixed yellow and brown Clayey SILT		0.76		176.18	3-7-8	0.30		
			1.50		1.22	175.72				
				1.52		175.42	7-12-15	0.34		
					1.98	174.96				
2.13	174.81	Mixed reddish-brown, gray and tan SILT, some sand, trace of mica and clay		2.29		174.65	17-11-17	0.40		
			3.00		2.74	174.20				
3.00	173.94	Yellow-brown Silty fine to medium SAND		3.05		173.89	6-11-12	0.30		
					3.51	173.43				
4.57	172.37		4.50	4.57		172.37	28-40-50/.09	0.37		
					4.97	171.97				
		Mixed gray and yellowbrown Silty fine to medium SAND								
			6.00	6.10		170.84	50/.122	0.12		
		(decomposed quartz monzanite)			6.22	170.72				
			7.50	7.62	7.62	169.32	50/0	0.00		
			9.00	9.14	9.14	167.80	50/0	0.00		
			10.50	10.67		166.27	50/..03	0.03		
					10.70	166.24				
12.04	164.90		12.00	12.04	12.04	164.90	50/0	0.00		
		QUARTZ MONZANITE 45 to 80 degree weathered joints					core run #1	0.87	96	0
				12.95	12.95	163.99				
		35 to 75 degree joints	13.50				core run #2	1.53	100	86
					14.48	162.46				
14.48	162.46	Bottom of boring @ 14.48 meters	15.00							

GROUNDWATER DEPTH: 6.16 Meters CAVE-IN DEPTH: 8.99 Meters GROUNDWATER ELEVATION: 170.78 @ 11-13-97

GROUNDWATER DEPTH: 6.13 Meters CAVE-IN DEPTH: 8.29 Meters GROUNDWATER ELEVATION: 170.81 @ 11-17-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: H-4 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B630

BORING LOCATION: Station 12+35, 7m rt., Hydraulic Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 173.32 Meters

STREAM / ROAD CROSSING Hydraulic Road over proposed Bypass

SUBSTRUCTURE UNIT: Pier

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 11-11-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: BK-51, hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	173.32	TOPSOIL (yellow-brown Sandy SILT)	0.00						
0.15	173.17					2-2-3	0.15		
		Reddish-tan Silty CLAY, trace of fine sand and mica		0.46	172.86				
			0.76		172.56	4-5-7	0.40		
1.22	172.10			1.22	172.10				
			1.52		171.80	4-4-5	0.46		
		Orange-brown Clayey SILT with gray veins		1.98	171.34				
			2.29		171.03	2-3-3	0.46		
2.74	170.58			2.74	170.58				
			3.05		170.27	2-3-4	0.46		
		Mixed yellow-brown and gray Silty CLAY		3.51	169.81				
4.27	169.05								
			4.57		168.75	2-2-3	0.46		
		Grayish-brown Clayey SILT		5.03	168.29				
			6.10		167.22	2-2-4	0.46		
				6.55	166.77				
7.62	165.70		7.62		165.70	9-10-12	0.46		
				8.08	165.24				
		Grayish-brown SILT, some fine sand, trace of clay							
			9.14		164.18				
9.45	163.87					20-19-50/.12	0.30		
				9.57	163.75				
		Mixed gray and brown SILT, some fine sand, trace of coarse sand							
10.67	162.65		10.67		162.65	12-26-50/.12	0.43		
				11.09	162.23				
		Gray Clayey SILT							
		grades into mixed gray and brown							
			12.19		161.13	24-50/.12	0.27		
12.47	160.85			12.47	160.85				
		Bottom of boring @ 12.17 meters							

GROUNDWATER DEPTH: 2.80 Meters CAVE-IN DEPTH: 9.17 Meters GROUNDWATER ELEVATION: 170.52 @ 11-12-97

GROUNDWATER DEPTH: 2.93 Meters CAVE-IN DEPTH: 9.05 Meters GROUNDWATER ELEVATION: 170.39 @ 11-13-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B630

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Hydraulic Road over proposed Bypass

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: BK-51, hollow-stem augers, manual hammer

BORING NO: H-5 PAGE 1

BORING LOCATION: Station 12+68, 10m lt., Hydraulic Rd. Const. B/L

BORING ELEVATION: 175.58 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 11-12-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	175.58	Brown Sandy CLAY, some silt	0.00			4-5-5	0.27		
0.12	175.46	Reddish-tan Clayey SILT, trace of sand		0.46	175.12				
			0.76		174.82	2-3-4	0.30		
				1.22	174.36				
1.37	174.21	Orange-tan Silty fine to coarse SAND	1.52		174.06	3-4-5	0.43		
				1.98	173.60				
			2.29		173.29	2-3-4	0.37		
				2.74	172.84				
			3.05		172.53	5-5-5	0.37		
				3.51	172.07				
3.66	171.92	Dark brownish-gray highly micaceous SILT	4.57		171.01	5-7-9	0.46		
				5.03	170.55				
5.79	169.79	Mixed orange-brown and gray fine to coarse Silty SAND, some weathered rock fragments AUGER REFUSAL	6.10		169.48	31-33-18	0.37		
				6.55	169.03				
6.71	168.87		6.71	6.71	168.87	50/0	0.00		

UNABLE TO PENETRATE @ 6.71 METERS

GROUNDWATER DEPTH: 3.44 Meters CAVE-IN DEPTH: 5.73 Meters GROUNDWATER ELEVATION: 172.14 @ 11-13-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS: hole backfilled due to position in roadway

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: H-6 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B630

BORING LOCATION: Station 12+76, 7m rt., Hydraulic Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 174.51 Meters

STREAM / ROAD CROSSING Hydraulic Road over proposed Bypass

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 11-11-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: BK-51,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STRATA (Meters)	DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	174.51		TOPSOIL	0.00						
0.15	174.36		Grayish-tan Silty SAND, trace of mica and roots		0.46	174.05	1-2-2	0.30		
0.61	173.90		Orange-brown SILT, some sand, some clay, trace of mica	0.76	1.22	173.75 / 173.29	3-4-6	0.30		
				1.52	1.98	172.99 / 172.53	3-4-5	0.46		
2.29	172.22		Orange-tan Silty SAND	2.29	2.74	172.22 / 171.77	5-5-6	0.46		
			water in sampler	3.05	3.51	171.46 / 171.00	4-4-6	0.40		
3.96	170.55		Mixed gray and light brown Silty fine to coarse SAND, trace of mica	4.57	5.03	169.94 / 169.48	4-4-7	0.43		
				6.10	6.55	168.41 / 167.96	6-10-15	0.30		
6.71	167.80		Gray and brown fine to coarse SAND, some silt and decomposed rock fragments, trace of gravel and mica AUGER REFUSAL	7.62	7.71	166.89 / 166.80	50/.09	0.00		
7.71	166.80		**UNABLE TO PENETRATE @ 7.71 METERS**							

GROUNDWATER DEPTH: 2.29 Meters CAVE-IN DEPTH: 4.40 Meters GROUNDWATER ELEVATION: 172.22 @ 11-12-97

GROUNDWATER DEPTH: 2.38 Meters CAVE-IN DEPTH: 4.48 Meters GROUNDWATER ELEVATION: 172.13 @ 11-13-97

REMARKS:

DATE: 1-13-97, 1-14-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
160+80	TOPSOIL	0.00 - 0.15								boulder outcrop nearby
Route 29	Light brown micaceous SILT, trace of	0.15 - 7.60	25	0.76	0.15 - 0.76	266	16.2	11.5	1930.2	A-2-4(0), LL=25, PI=N.P., CBR=33.8
Const.	sand and fine to med rock frags			1.50	0.76 - 1.50	429	5.5	11.5	1930.2	
B/L				3.00	1.50 - 3.50	402	6.3	11.5	1930.2	
				4.60	3.50 - 5.00	254	6.7	11.5	1930.2	
	SEE REMARK			6.10	5.00 - 6.50	280	6.9	11.5	1930.2	first attempt UTP @ 6.3m, second
				6.80	6.50 - 7.60	525	7.8	11.5	1930.2	attempt offset 3m
	Light brown micaceous SILT, trace of	7.60 - 18.2	26	8.30	7.60 - 8.30	329	8.2	10.1	2007.1	A-4(0), LL=25, PI=N.P., CBR=25.5
	fine to medium rock fragments			9.10	8.30 - 11.5	448	7.5	10.1	2007.1	
				13.7	11.5 - 14.4	355	8.1	10.1	2007.1	
				15.2	14.4 - 15.8	265	9.1	10.1	2007.1	
				16.8	15.8 - 17.5	95	9.5	10.1	2007.1	
				18.2	17.5 - 18.2	231	10.5	10.1	2007.1	
167+20	TOPSOIL	0.00 - 0.18								
Rt 29 Byp	Brown micaceous SILT, trace of sand	0.18 - 1.20		0.76	0.18 - 0.76	262	17.8	11.5	1930.2	
Const.	and weathered rock fragments			1.20	0.76 - 1.20	446	17.7	11.5	1930.2	
B/L	Light gray SILT, weathered rock frags	1.20 - 1.90	24	1.90	1.20 - 1.90	106	6.9	11.2	1999.1	A-4(0), LL=25, PI=N.P., CBR=46
										rock or boulder @ 1.9m
	UNABLE TO PENETRATE @ 1.9m									
187+20	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Brown micaceous SILT, trace of fine	0.15 - 3.40	19	0.76	0.15 - 0.91	526	13.4	10.8	2026.4	A-4(0), LL=24, PI=N.P., CBR=26.3
NBL	gravel			1.50	0.91 - 2.80	225	13.6	10.8	2026.4	trace of weathered rock fragments
Const.				3.40	2.80 - 3.40	97	9.0	10.8	2026.4	below 1.0m
B/L										

DATE: 1-13-97, 1-18-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres.	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
191+00	TOPSOIL	0.00 - 0.12								
Rt 29 Byp	Reddish-brown Clayey SILT, trace mica	0.12 - 5.10	20	0.76	0.12 - 0.91	467	23.0	24.4	1584.2	A-5(4), LL=53, PI=N.P., CBR=9.1
NBL				1.60	0.91 - 2.50	250	18.4	24.4	1584.2	
Const.				3.40	2.50 - 5.10	124	19.0	24.4	1584.2	
B/L	Light brown micaceous SILT	5.10 - 13.0	21	6.10	5.10 - 6.40	369	19.5	20.0	1656.3	A-5(2), LL=46, PI=N.P., CBR=2.1
				7.50	6.40 - 8.20	50	19.3	20.0	1656.3	
				9.60	8.20 - 10.1	316	18.2	20.0	1656.3	firm below 9.6m
				10.7	10.1 - 12.5	198	19.3	20.0	1656.3	
				13.0	12.5 - 13.0	69	21.2	20.0	1656.3	
196+00	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-tan SILT w/veins of gray,	0.15 - 4.30	35	1.00	0.15 - 1.50	437	14.2	12.2	1971.9	A-4(0), LL=23, PI=N.P., CBR=16.3
NBL	trace of weathered rock fragments			2.40	1.50 - 2.20	283	7.8	12.2	1971.9	
Const.	and mica			3.70	2.20 - 3.40	53	10.8	12.2	1971.9	
B/L										
	UNABLE TO PENETRATE @ 4.3m									
199+20	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-tan SILT, tr clay and mica	0.15 - 1.50	36	1.00	0.15 - 1.50	430	24.2	17.5	1776.5	A-5(6), LL=41, PI=10, CBR=25.1
NBL	Gray SILT, some weathered rock & mica	1.50 - 3.00	37	2.40	1.50 - 2.10	245	11.5	11.2	1989.5	A-4(0), LL=27, PI=N.P.
Const.										
B/L	UNABLE TO PENETRATE @ 3.0m									

DATE: 1-13-97, 1-14-97, 1-15-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
206+09	ASPHALT CONCRETE (surface treatment)	0.00 - 0.06								
Rt 29 Byp	CRUSHED AGGREGATE, some silt	0.06 - 0.20								
SBL	Reddish-brown Clayey SILT, trace mica	0.20 - 2.10	28	1.00	0.20 - 1.50	369	23.6	14.4	1821.3	A-4(1), LL=36, PI=4, CBR=6.9
Const.				2.00	1.50 - 2.10	225	19.8	14.4	1821.3	
B/L	Gray highly micaceous SILT	2.10 - 8.30	29	2.70	2.10 - 4.20	504	22.5	13.9	1834.1	A-4(0), LL=32, PI=N.P., CBR=10.6
				7.30	4.20 - 7.60	191	20.7	13.9	1834.1	
				8.30	7.60 - 8.30	97	18.1	13.9	1834.1	rock or boulder @ 7.6m
213+00	TOPSOIL	0.00 - 0.03								
Rt 29 Byp	Reddish-brown SILT, trace of mica and fine to medium quartz gravel	0.03 - 6.10	17	0.76	0.03 - 1.91	471	21.0	13.2	1871.0	A-2-6(0), LL=37, PI=12, CBR=19.2
CL				2.30	1.97 - 2.80	466	14.6	13.2	1871.0	
Const.				3.50	2.80 - 4.30	416	13.1	13.2	1871.0	
B/L				6.10	4.30 - 6.10	293	15.8	13.2	1871.0	rock encountered @ 6.1m
	Brown Clayey SILT, some fine to medium quartz gravel, trace mica	6.10 - 9.60	18	9.10	6.10 - 9.40	504	10.5	10.1	1979.9	A-6(1), LL=33, PI=12, CBR=20.6
				9.60	9.40 - 9.60	285	12.5	10.1	1979.9	
216+40	TOPSOIL	0.00 - 0.14								
5m rt.	Reddish-brown Clayey SILT, trace mica	0.14 - 1.60	22	0.76	0.14 - 1.60	234	33.7	22.2	1609.9	A-7-5(12), LL=54, PI=15
Rt 29 Byp	Tan micaceous SILT, trace of sand	1.60 - 7.00	23	1.90	1.60 - 2.20	403	27.7	16.0	1704.4	A-5(4), LL=41, PI=7, CBR=4.0
SBL				3.00	2.20 - 3.50	65	33.8	16.0	1704.4	water @ 3.1m, very soft
Const.				4.60	3.50 - 4.80	426	37.2	16.0	1704.4	caved @ 4m
B/L				6.00	4.80 - 7.00	176	43.9	16.0	1704.4	

DATE: 1-8-97, 1-18-97, 1-21-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (if borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
221+00	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-brown Silty CLAY	0.15 - 1.70	38	1.00	0.15 - 1.70	147	45.0	26.6	1525.0	A-7-5(21), LL=58, PI=25, CBR=8.6
NBL	Brown Clayey SILT, trace of mica	1.70 - 2.30		2.30	1.70 - 3.00	275	18.9	26.6	1525.0	moist
Const.	Gray SILT, trace of rock fragments	2.30 - 3.00	39					15.9	1842.1	A-7-6(18), LL=47, PI=24
B/L										very tight
228+20	Mixed TOPSOIL & FILL	0.00 - 1.30		0.76	0.00 - 1.30	266	24.4			
Rt 29 Byp	Tan Silty CLAY, trace of fine sand	1.30 - 6.80	16	2.30	1.30 - 2.70	425	17.3	13.5	1834.1	A-6(4), LL=37, PI=13, CBR=19.2
NBL				3.80	2.70 - 3.90	297	19.5	13.5	1834.1	
Const.				4.00	3.90 - 5.00	70	16.7	13.5	1834.1	
B/L				5.50	5.00 - 6.00	446	16.5	13.5	1834.1	
				6.50	6.00 - 6.80	402	15.4	13.5	1834.1	
	UNABLE TO PENETRATE @ 6.8m									
233+40	CRUSHED AGGREGATE	0.00 - 0.30								
Rt 29 Byp	Reddish-tan Clayey SILT, trace mica	0.30 - 2.50	43	0.76	0.30 - 0.76	474	13.2	17.5	1770.1	A-7-6(14), LL=48, PI=23
Const.				1.80	0.76 - 2.50	512	19.1	17.5	1770.1	
B/L										

DATE: 1-6-97, 1-8-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
238+00	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-brown Clayey SILT, trace of	0.15 - 3.00	13	0.76	0.15 - 0.90	526	20.3	18.1	1709.2	A-5(6), LL=44, PI=10, CBR=7.0
Const.	quartz fragments and mica			1.50	0.90 - 2.00	104	20.7	18.1	1709.2	
B/L				3.00	2.00 - 3.00	448	17.1	18.1	1709.2	
243+00	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-brown Clayey SILT, trace mica	0.15 - 2.30	14	0.76	0.15 - 0.90	415	28.8	24.4	1563.4	A-7-5(16), LL=54, PI=17, CBR=10.7
Const.				2.00	0.90 - 2.50	50	25.8	24.4	1563.4	
B/L	Brown micaceous SILT	2.30 - 13.6	15	3.30	2.50 - 3.70	456	20.3	17.5	1693.2	A-4(2), LL=38, PI=N.P., CBR=1.1
				5.30	3.70 - 5.70	276	21.7	17.5	1693.2	
				6.70	5.70 - 7.00	313	16.3	17.5	1693.2	
				8.40	7.00 - 9.00	262	16.2	17.5	1693.2	
				9.50	9.00 - 11.0	541	12.8	17.5	1693.2	
				12.0	11.0 - 12.5	65	15.2	17.5	1693.2	
				13.6	12.5 - 13.6	225	13.9	17.5	1693.2	
251+20	TOPSOIL	0.00 - 0.15								
50m lt.	Reddish-brown micaceous SILT,	0.15 - 1.60	1	0.76	0.15 - 0.76	450	15.3	22.2	1613.1	A-5(7), LL=46, PI=8, CBR=7.7
Rt 29 Byp	trace of clay			1.50	0.76 - 1.50	467	16.3	22.2	1613.1	
SBL				1.60	1.50 - 1.60	416	11.5	22.2	1613.1	
Const.	Brown micaceous SILT, trace of fine	1.60 - 11.1	2	3.00	1.60 - 3.00	175	7.4	12.9	1895.0	A-4(0), LL=29, PI=N.P., CBR=8.5
B/L	weathered rock fragments			4.50	3.00 - 4.50	33	8.1	12.9	1895.0	
				6.00	4.50 - 6.00	369	10.5	12.9	1895.0	
				7.60	6.00 - 7.60	337	7.4	12.9	1895.0	
				9.10	7.60 - 9.10	106	7.5	12.9	1895.0	
				10.7	9.10 - 10.7	466	8.1	12.9	1895.0	
				11.1	10.7 - 11.1	30	8.1	12.9	1895.0	
	Dark brown micaceous SILT, trace of	11.1 - 14.0	3	14.0	11.1 - 14.0	403	9.3	13.5	1887.0	A-4(0), LL=28, PI=N.P., CBR=12.0
	fine weathered rock fragments									very tight below 11.5m

DATE: 1-6-97, 1-7-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
252+00	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-brown micaceous SILT, tr clay	0.15 - 2.10		0.91	0.15 - 0.91	223	20.6	22.2	1613.1	
NBL				2.10	0.91 - 2.10	97	14.6	22.2	1613.1	
Const.	Brown micaceous SILT	2.10 - 16.0		3.70	2.10 - 3.70	293	14.0	12.9	1895.0	
B/L				5.80	3.70 - 5.80	176	9.5	12.9	1895.0	
				7.30	5.80 - 7.30	437	9.8	12.9	1895.0	
				8.80	7.30 - 8.80	254	9.2	12.9	1895.0	
				10.7	8.80 - 10.7	430	8.9	12.9	1895.0	
				14.0	10.7 - 16.0	493	12.9	12.9	1895.0	
256+20	TOPSOIL	0.00 - 0.12								
Rt 29 Byp	Light reddish-brown Clayey SILT,	0.12 - 2.50	7	0.76	0.12 - 0.76	149	19.8	19.5	1670.7	A-5(2), LL=43, PI=N.P., CBR=13.5
SBL	trace of mica			1.50	0.76 - 1.50	156	19.0	19.5	1670.7	
Const.				2.50	1.50 - 2.50	512	15.7	19.5	1670.7	
B/L	Light brown micaceous SILT	2.50 - 12.5	8	4.60	2.50 - 4.60	462	12.2	15.6	1760.4	A-4(0), LL=33, PI=N.P., CBR=0.4
				6.10	4.60 - 6.10	182	9.6	15.6	1760.4	
				7.60	6.10 - 7.60	135	13.1	15.6	1760.4	
				9.10	7.60 - 9.10	105	14.0	15.6	1760.4	
				12.5	9.10 - 12.5	474	14.3	15.6	1760.4	
257+40	TOPSOIL	0.00 - 0.09								
Rt 29 Byp	Reddish-brown Clayey SILT, trace mica	0.09 - 2.50	5	0.91	0.09 - 0.91	123	23.7	22.8	1605.1	A-7-5(12), LL=46, PI=14, CBR=9.1
NBL				1.80	0.91 - 1.80	302	22.5	22.8	1605.1	
Const.				2.50	1.80 - 2.50	460	19.5	22.8	1605.1	
B/L	Brown SILT, trace of mica	2.50 - 5.00	6	5.00	2.50 - 5.00	53	17.5	20.2	1662.7	A-7-5(20), LL=67, PI=20, CBR=0.8

DATE: 1-6-97, 1-7-97, 1-8-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Route 29 Bypass									
258+80	TOPSOIL	0.00 - 0.15								
Rt 29 Byp	Reddish-brown Clayey SILT, trace mica	0.15 - 3.00	11	0.76	0.15 - 0.90	426	30.3	22.1	1621.1	A-7-5(12), LL=51, PI=14, CBR=9.6
SBL				1.50	0.90 - 2.00	252	29.2	22.1	1621.1	
Const.				3.00	2.00 - 4.20	196	20.2	22.1	1621.1	
B/L	Brown micaceous SILT	3.00 - 12.5	12	6.10	4.20 - 6.50	238	17.7	16.2	1741.2	A-4(0), LL=35, PI=N.P., CBR=1.2
				7.60	6.50 - 8.20	442	14.2	16.2	1741.2	
				9.10	8.20 - 9.60	234	12.9	16.2	1741.2	
				10.7	9.60 - 11.0	250	12.1	16.2	1741.2	
				12.5	11.0 - 12.5	429	14.8	16.2	1741.2	
261+00	TOPSOIL	0.00 - 0.12								
Rt 29 Byp	Reddish-brown SILT, trace mica	0.12 - 1.50	9	0.76	0.12 - 0.76	540	20.8	18.3	1728.4	A-7-5(12), LL=48, PI=18, CBR=10.2
NBL				1.50	0.76 - 1.50	459	15.3	18.3	1728.4	
Const.	Tan micaceous SILT	1.50 - 6.00	10	3.90	1.50 - 3.90	478	13.2	14.5	1856.6	A-4(0), LL=36, PI=N.P., CBR=6.7
B/L				6.00	3.90 - 6.00	95	12.3	14.5	1856.6	
	North Grounds Conn.									
155+20	TOPSOIL	0.00 - 0.15								
N. Gnds	Brown SILT, trace of fine to medium gravel and mica	0.15 - 1.50	32	0.76	0.15 - 1.50	238	11.2	10.8	1976.7	A-4(0), LL=24, PI=N.P., CBR=13.8
Conn.										
Const.	Reddish-brown SILT, trace of mica	1.50 - 3.40	33	1.80	1.50 - 3.40	482	15.9	14.4	1851.8	A-4(3), LL=35, PI=8
B/L	Grayish-brown micaceous SILT, tr sand	3.40 - 8.50	34	3.60	3.40 - 3.80	104	13.0	13.1	1858.2	A-4(0), LL=28, PI=N.P., CBR=2.7
				6.30	3.80 - 5.50	541	17.5	13.1	1858.2	
				8.10	5.50 - 8.50	425	13.1	13.1	1858.2	

DATE: 1-6-97, 1-15-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres.	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	North Grounds Conn.									
158+80 N. Gnds Conn. Const. B/L	TOPSOIL	0.00 - 0.15								
	Reddish-brown Clayey SILT, trace silt	0.15 - 1.80	30	0.76	0.15 - 1.30	449	24.0	19.2	1709.2	A-7-5(7), LL=48, PI=14
				1.80	1.30 - 1.80	190	10.6	19.2	1709.2	
	Grayish-brown micaceous SILT, some fine to medium weathered rock fragments, trace of fine sand	1.80 - 5.40	31	3.00	1.80 - 3.60	198	9.5	11.7	1925.4	A-4(0), LL=24, PI=N.P., CBR=39.5
				4.60	3.60 - 4.90	285	8.7	11.7	1925.4	
				5.40	4.90 - 5.40	471	7.3	11.7	1925.4	
	UNABLE TO PENETRATE @ 5.4m first attempt									
	UNABLE TO PENETRATE @ 3.7m second attempt									
	Reloc. Massie Road									
151+20 Reloc. Massie Rd Const. B/L	TOPSOIL	0.00 - 0.15								
	Reddish-brown SILT w/gray veins, some fine sand, trace of mica	0.15 - 2.70	27	0.76	0.15 - 1.00	441	17.9	12.7	1891.8	A-4(0), LL=30, PI=N.P., CBR=31.4
				1.50	1.00 - 1.80	423	15.4	12.7	1891.8	
				2.40	1.80 - 2.70	76	15.2	12.7	1891.8	grinding
	UNABLE TO PENETRATE @ 2.7m									
	Ramp H									
13+60 Ramp H Const. B/L	TOPSOIL	0.00 - 0.15								
	Reddish-brown micaceous SILT, tr clay	0.15 - 2.10		0.76	0.15 - 0.76	329	21.5	22.2	1613.1	
				1.50	0.76 - 2.10	66	22.8	22.2	1613.1	
	Brown micaceous SILT	2.10 - 16.0	4	3.00	2.10 - 3.00	525	12.9	18.5	1696.4	A-4(0), LL=33, PI=N.P., CBR=1.1
				4.60	3.00 - 4.60	147	10.9	18.5	1696.4	
				6.10	4.60 - 6.10	320	9.1	18.5	1696.4	
				7.60	6.10 - 7.60	245	8.7	18.5	1696.4	
				10.8	7.60 - 10.8	283	12.5	18.5	1696.4	
				13.9	10.8 - 13.9	470	9.5	18.5	1696.4	
				16.0	13.9 - 16.0	275	9.2	18.5	1696.4	

DATE: 1-8-97, 1-21-97

ROUTE: US Route 29, Charlottesville Bypass PROJECT NO: 6029-002-F22, PE101, C501 COUNTY: Albemarle
BY: H. N. Jenkins PURPOSE: Soil Survey (If borrow) LANDOWNER:

Station or Hole # (Meters)	SOIL DESCRIPTION	Depth (Meters)	Soil Sample Number	FIELD MOISTURE DETERMINATION Depth Taken (Meters)	Depth Repres. (Meters)	Dish #	Field Moist	Lab Results of Soil O.M.	M.D. (kg/cu m)	REMARKS
	Ramp J									
61+00	TOPSOIL	0.00 - 0.15								
Ramp J	Reddish-brown SILT, trace of mica	0.15 - 1.70		0.91	0.15 - 0.95	471	34.9	22.1	1613.1	
Const.				1.50	0.95 - 1.70	76	24.5	22.1	1613.1	
B/L	Brown micaceous SILT	1.70 - 11.5		3.00	1.70 - 4.00	198	17.7	18.5	1696.4	
				4.50	4.00 - 5.70	27	24.9	18.5	1696.4	
				6.10	5.70 - 7.50	404	18.4	18.5	1696.4	
				9.10	7.50 - 9.80	73	16.4	18.5	1696.4	
				11.5	9.80 - 11.5	292	19.8	18.5	1696.4	
	Reloc. Route 250									
4226+60	TOPSOIL	0.00 - 0.15								
Reloc.	Brown Clayey SILT, trace of fine	0.15 - 8.50	40	0.91	0.15 - 1.50	460	21.0	10.6	1970.3	A-4(0), LL=24, PI=N.P., CBR=27.2
Route 250	sand and rock fragments			3.00	1.50 - 3.50	303	14.8	10.6	1970.3	
Const.	(POSSIBLE FILL)			4.50	3.50 - 5.80	543	16.1	10.6	1970.3	
B/L				7.60	5.80 - 8.00	160	14.4	10.6	1970.3	
				8.50	8.00 - 8.50	463	12.5	10.6	1970.3	
	Brown micaceous SILT, trace of fine	8.50 - 14.3	41	12.2	8.50 - 12.0	105	13.5	11.8	1946.3	A-4(0), LL=24, PI=N.P., CBR=11.3
	sand (original ground?)			14.3	12.0 - 14.3	478	10.2	11.8	1946.3	
	Brown micaceous SILT, trace of fine	14.3 - 16.0	42	16.0	14.3 - 16.0	418	11.2	9.1	1986.3	A-4(0), LL=23, PI=N.P.
	sand and fine rock fragments									

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-7 PAGE 1

BORING LOCATION: Station 245+41, 5.8m lt., SBL Const. B/L

BORING ELEVATION: 131.50 Meters

SUBSTRUCTURE UNIT: Abutment A

DATE DRILLED: 9-30-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORE REC (%)
0.00	131.50	TOPSOIL						
0.15	131.35	BOULDERS, some tan silt						
0.91	130.59	Gray Mica SCHIST	0.91		130.59			
		60 degree fractures completely weathered (soil) from 1.54 to 1.64 meters	1.83	1.83	129.67	core run #1	0.92	100
		weathered joints, 55 to 70 degrees	3.35	3.35	128.15	core run #2	1.52	100
		55 to 70 degree joints	4.72	4.72	126.78	core run #3	0.52	38
		weathered, stained 55 to 70 degree joints from 5.14 to 5.53 meters	5.33	5.33	126.17	core run #4	0.61	100
		55 to 70 degree joints	6.25	6.25	125.25	core run #5	0.92	100
		quartz vein @ 6.4 meters 55 degree joints		7.16	124.34	core run #6	0.79	87
7.16	124.34	BOTTOM OF BORING @ 7.16 METERS						

GROUNDWATER DEPTH: 5.94 Meters CAVE-IN DEPTH: 6.79 Meters GROUNDWATER ELEVATION: 125.56 @ 10-7-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 6.64 Meters GROUNDWATER ELEVATION: N/A @ 10-15-97

REMARKS: boulder outcrop nearby

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-8 PAGE 1

BORING LOCATION: Station 245+79, 15m lt., SBL Const. B/L

BORING ELEVATION: 119.01 Meters

SUBSTRUCTURE UNIT: Pier 1

DATE DRILLED: 10-2-97, 10-3-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE RESULTS REC (%)
0.00	119.01	TOPSOIL, rootmat and boulders						
0.15	118.86	Tan micaceous SILT, some boulder fragments						
			0.91		118.10	6-8-11	0.18	
				1.37	117.64			
1.67	117.34	Gray SILT, some weathered rock fragments	1.52		117.49	40-50/.06	0.12	
				1.74	117.27			
			2.29		116.72	37-50/.09	0.18	
		grinding @ 2.74 meters		2.53	116.48			
			3.05		115.96	50/.03	0.00	
3.17	115.84	30 to 80 degree weathered joints	3.17	3.08	115.93 115.84	core run #1	0.79	100
		Gray slightly weathered Mica SCHIST	3.96	3.96	115.05			
		35 to 85 degree joints				core run #2	1.37	100
			5.33	5.33	113.68			
		40 to 70 degree joints				core run #3	0.94	100
6.28	112.73	BOTTOM OF BORING @ 6.28 METERS		6.28	112.73			

GROUNDWATER DEPTH: 4.11 Meters CAVE-IN DEPTH: 5.21 Meters GROUNDWATER ELEVATION: 114.90 @ 10-7-97

GROUNDWATER DEPTH: 4.02 Meters CAVE-IN DEPTH: 5.00 Meters GROUNDWATER ELEVATION: 114.99 @ 10-14-97

REMARKS: boulders, outcrops nearby

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-9 PAGE 1

BORING LOCATION: Station 246+28, 9.5m lt., SBL Const. B/L

BORING ELEVATION: 106.25 Meters

SUBSTRUCTURE UNIT: Pier 2

DATE DRILLED: 10-3-97, 10-4-97, 10-5-97, 10-6-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORE RES REC (%)
0.00	106.25	TOPSOIL, rootmat and boulders						
0.15	106.10							
		Tan SILT, some quartz fragments, trace of mica	0.76		105.49			
		quartz boulder/stringer		1.22	105.03	4-4-9	0.24	
			1.52		104.73			
				1.98	104.27	7-9-12	0.21	
			2.23		104.02			
				2.74	103.51	24-14-17	0.09	
		dense (decomposed rock) below 2.29 meters	3.05		103.20	47-23-49	0.30	
				3.20	103.05			
			3.81		102.44	50/.122	0.09	
				3.93	102.32			
4.27	101.98							
		Gray SILT, some rock fragments and mica grinding from 4.27 to 5.18m	4.57		101.68	24-28-17	0.21	
		decomposed rock		5.03	101.22			
5.18	101.07		5.33		100.92			
		Interlayered gray highly weathered SCHIST and gray micaceous SILT		5.79	100.46	17-24-25	0.27	
			6.09		100.16	50/.122	0.09	
				6.22	100.03			
		ground through soil and rock to a depth of 6.49 meters	6.37		99.88	50/.122	0.09	
			6.49	6.49	99.76			
		alternately cored and drilled to a depth of 8.07 meters				core run #1	0.00	0
				7.25	99.00			
			7.62		98.63	50/.030**	0.00	
				7.65	98.60			
8.08	98.17		8.07		98.18			
		no fractures, core intact				core run #2	0.62	100
		Dark gray Mica SCHIST	8.69	8.69	97.56			
		no fractures, core intact				core run #3	0.91	100
			9.60	9.60	96.65			
		no fractures, core intact				core run #4	1.53	100
11.13	95.12			11.13	95.12			
		Bottom of boring @ 11.13 meters						

GROUNDWATER DEPTH: 5.30 Meters CAVE-IN DEPTH: 6.16 Meters GROUNDWATER ELEVATION: 100.95 @ 10-7-97

GROUNDWATER DEPTH: 5.09 Meters CAVE-IN DEPTH: 5.43 Meters GROUNDWATER ELEVATION: 101.16 @ 10-14-97

REMARKS: **used 1-13/16 O.D., 1-3/16 I.D. split spoon, multiply recorded blows X 1.3 for corrected value

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-10 PAGE 1

BORING LOCATION: Station 246+92, 10.5m lt., SBL Const. B/L

BORING ELEVATION: 105.00 Meters

SUBSTRUCTURE UNIT: Pier 3

DATE DRILLED: 10-9-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	105.00	TOPSOIL, rootmat, some gravel, sand and mica						
0.15	104.85	Tan SILT, some gravel, sand and mica	0.76		104.24			
				1.22	103.78	5-6-5	0.21	
			1.52		103.48			
1.98	103.02	Brown SILT, some fine sand and mica		1.98	103.02	5-7-9	0.24	
			2.23		102.77			
				2.74	102.26	4-5-5	0.21	
			3.05		101.95			
				3.32	101.68	16-50/.122	0.15	
			3.81		101.19			
4.11	100.89	Tan SILT, some cobbles, gravel, sand and mica		4.24	100.76	10-14-50/.122	0.18	
4.57	100.43	Light gray Mica SCHIST; 25 to 65 degree fractures	4.57	4.57	100.43	50/0	0.00	
			5.18	5.18	99.82	core run #1	0.42	69
		45 to 70 degree fractures; increase in foliation, schistocity, and mica content, interlayered schistose and gneissic structures, weathered joints	6.71	6.71	98.29	core run #2	1.52	100
		45 to 70 degree fractures	8.23	8.23	96.77	core run #3	1.29	85
		60 to 65 degree fractures; localized solutioning				core run #4	1.46	96
9.75	95.25	Bottom of boring @ 9.75 meters		9.75	95.25			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.19 Meters GROUNDWATER ELEVATION: N/A @ 10-11-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.19 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-11 PAGE 1

BORING LOCATION: Station 247+52, 10.5m lt., SBL Const. B/L

BORING ELEVATION: 106.05 Meters

SUBSTRUCTURE UNIT: Pier 4

DATE DRILLED: 10-11-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

DEPTH (Meters)	STATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORE REC (%)
0.00	106.05	TOPSOIL, rootmat						
0.15	105.90							
		Tan SILT with gray veins, some mica	0.76		105.29			
				1.22	104.83	3-3-5	0.37	
			1.52		104.53			
				1.98	104.07	7-8-6	0.40	
1.98	104.07							
		Brown micaceous Clayey SILT, trace of fine sand	2.29		103.76			
				2.74	103.31	4-6-6	0.43	
		trace of gravel between 2.44 and 2.56 meters	3.05		103.00			
3.51	102.54			3.51	102.54	2-37-13	0.30	
		Brown Sandy SILT, some cobbles						
		cobbles between 3.51 and 3.75 meters	4.57		101.48			
				5.03	101.02	35-44-25	0.12	
5.33	100.72		5.33		100.72			
		Gray highly weathered to very slightly weathered SCHIST				core run #1	0.91	99
		70 to 85 degree weathered joints solutioning between 6.1 and 6.55 meters	6.25	6.25	99.80			
		Dark gray Mica SCHIST/GNEISS				core run #2	1.44	95
		veined appearance between 6.98 and 7.92 meters						
			7.77	7.77	98.28			
		60 to 65 degree joints				core run #3	1.43	93
9.30	96.75			9.30	96.75			
		Bottom of boring @ 9.30 meters						

GROUNDWATER DEPTH: 0.82 Meters CAVE-IN DEPTH: 1.37 Meters GROUNDWATER ELEVATION: 105.23 @ 10-13-97

GROUNDWATER DEPTH: 0.85 Meters CAVE-IN DEPTH: 1.37 Meters GROUNDWATER ELEVATION: 105.20 @ 10-15-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-12 PAGE 1

BORING LOCATION: Station 248+12, 10.5m lt. SBL Const. B/L

BORING ELEVATION: 115.91 Meters

SUBSTRUCTURE UNIT: Pier 5

DATE DRILLED: 10-12-97

LOGGED BY: B. Mills

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	115.91	TOPSOIL, rootmat	0.00						
0.3	115.61	Dark gray to black GNEISS		0.30		115.61			
		breaks @ 0 to 25	0.75				Core run #1	1.48	97
			1.50	1.82	1.82	114.09			
		no joints, core intact	2.25				Core run #2	1.52	100
			3.00	3.34	3.34	112.57			
		breaks @ 0 to 25 degrees	3.75				Core run #3	1.50	100
			4.50	4.85	4.85	111.06			
		breaks @ 0 to 25 degrees	5.25				Core run #4	1.41	93
		weathered joint @ 6.33m	6.00	6.36	6.36	109.55			
6.64	109.27	contact of GNEISS w/ SCHIST @70 degree angle							
		Gray to dark gray Mica SCHIST 25 to 75 degree joints	6.75				Core run #5	1.52	99
7.88	108.03	Bottom of boring @ 7.88 meters	7.50		7.88	108.03			

GROUNDWATER DEPTH: 3.17 Meters CAVE-IN DEPTH: 8.05 Meters GROUNDWATER ELEVATION: 112.74 @ 10-14-97

GROUNDWATER DEPTH: 3.17 Meters CAVE-IN DEPTH: 8.05 Meters GROUNDWATER ELEVATION: 112.74 @ 10-20-97

REMARKS: boulder and bedrock outcrops nearby

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-13 PAGE 1

BORING LOCATION: Station 248+56, 10.5 meters lt. SBL Const. C/L

BORING ELEVATION: 126.86 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 10-13-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: N/A

STATA (Meters)	DEPTHS	STATA ELEVA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE RECOVERY REC (%)
0.00		126.86	TOPSOIL, rootmat, boulders						
0.15		126.71	Reddish-tan micaceous SILT, trace of fine sand	0.76		126.10	17-19-24	0.09	
1.22		125.64	Tan micaceous SILT		1.22	125.64			
1.52		125.34	Decomposed to highly weathered SCHIST	1.52		125.34	16-50/.09	0.18	
1.77		125.09	UNABLE TO PENETRATE (auger refusal) @ 1.77 METERS		1.77	125.09			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 1.19 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 1.19 Meters GROUNDWATER ELEVATION: N/A @ 10-20-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-14 PAGE 1

BORING LOCATION: Station 245+41, 6.5m lt., NBL Const. B/L

BORING ELEVATION: 134.65 Meters

SUBSTRUCTURE UNIT: Abutment A

DATE DRILLED: 10-1-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	134.65	TOPSOIL, rootmat						
0.15	134.50	Tan SILT, some weathered rock fragments and mica (decomposed schist)	0.76	0.95	133.89 133.70	46-50/.03	0.15	
			1.52	1.65	133.13 133.00	50/.12	0.09	
		grinding @ 2.74 meters	2.29	2.38	132.36 132.27	50/.09	0.09	
		UNABLE TO PENETRATE W/AUGERS @ 2.89 METERS						
2.89	131.76	Light gray fine-grained Mica SCHIST	2.90	2.90	131.75	50/0	0.00	
		50 degree fractures				core run #1	0.58	100
		55 to 80 degree weathered joints	3.44	3.44	131.21	core run #2	0.98	100
		40 to 70 degree fractures	4.42	4.42	130.23	core run #3	0.67	100
		70 degree fractures, foliated	5.09	5.09	129.56	core run #4	0.95	97
		fine-grained granitic appearance from 5.33 to 5.54 m foliated appearance, solutioning below 5.54m						
		gray to light gray highly weathered Mica SCHIST	6.07	6.07	128.58	core run #5	0.61	100
		35 to 80 degree fractures weathered joints						
6.68	127.97	BOTTOM OF BORING @ 6.68 METERS		6.68	127.97			

GROUNDWATER DEPTH: 1.76 Meters CAVE-IN DEPTH: 2.47 Meters GROUNDWATER ELEVATION: 132.89 @ 24 Hours

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.44 Meters GROUNDWATER ELEVATION: N/A @ 10-7-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-15 PAGE 1

BORING LOCATION: Station 245+79, 3.5m lt., NBL Const. B/L

BORING ELEVATION: 127.37 Meters

SUBSTRUCTURE UNIT: Pier 1

DATE DRILLED: 10-2-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC REC (%)
0.00	127.37	TOPSOIL, rootmat and boulders						
0.15	127.22							
		Reddish-tan highly micaceous SILT, some boulder fragments	0.76	1.22	126.61 / 126.15	8-6-6	0.30	
			1.52	1.98	125.85 / 125.39	7-9-10	0.21	
2.13	125.24							
		Tan and gray highly micaceous SILT	2.29	2.74	125.08 / 124.63	12-16-20	0.34	
			3.05	3.50	124.32 / 123.87	9-14-17	0.30	
			3.81	4.26	123.56 / 123.11	13-17-20	0.34	
			4.57	5.03	122.80 / 122.34	7-11-13	0.43	
			6.10	6.55	121.27 / 120.82	9-11-14	0.46	
			7.62	8.08	119.75 / 119.29	7-16-22	0.46	
			9.14	9.60	118.23 / 117.77	13-19-26	0.46	
			10.67	11.12	116.70 / 116.25	13-22-29	0.46	
			12.19	12.65	115.18 / 114.72	16-24-26	0.46	
		(decomposed Mica SCHIST)	13.71	14.14	113.66 / 113.23	24-48-50/.12	0.37	
15.51	111.86		15.24	15.51	112.13 / 111.86	36-50/.12	0.21	
		BOTTOM OF BORING @ 15.51 METERS						

GROUNDWATER DEPTH: 10.36 Meters CAVE-IN DEPTH: 14.54 Meters GROUNDWATER ELEVATION: 117.01 @ 10-7-97

GROUNDWATER DEPTH: 10.33 Meters CAVE-IN DEPTH: 13.38 Meters GROUNDWATER ELEVATION: 117.04 @ 10-14-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-16 PAGE 1

BORING LOCATION: Station 246+30, 11.5m lt., NBL Const. B/L

BORING ELEVATION: 107.04 Meters

SUBSTRUCTURE UNIT: Pier 2

DATE DRILLED: 10-3-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	107.04	TOPSOIL, rootmat and boulders						
0.15	106.89							
		Tan SILT, some quartz fragments, trace of mica	0.76		106.28			
		quartz boulder/stringer between 1.37 and 1.83 meters		1.22	105.82	4-4-8	0.21	
			1.52		105.52			
				1.98	105.06	37-24-9	0.18	
2.59	104.45		2.23		104.81			
		Reddish-tan micaceous SILT, trace of rock fragments		2.74	104.30	6-5-7	0.24	
2.90	104.14							
		Gray decomposed SCHIST	3.05		103.99	45-50/.122	0.24	
				3.32	103.72			
3.96	103.08		3.81		103.23		0.34	
		Reddish-tan micaceous SILT		4.27	102.77	32-21-20		
			4.57		102.47			
						6-10-14	0.37	
5.27	101.77			5.03	102.01			
		Decomposed to highly weathered SCHIST						
6.10	100.94		6.09		100.95			
		Gray to dark gray Mica SCHIST						
		some staining at joints 40 to 65 degree joints				core run #1	0.70	57
			7.31	7.31	99.73			
		40 to 65 degree joints				core run #2	0.77	100
			8.08	8.08	98.96			
		40 to 65 degree joints				core run #3	1.40	92
			9.60	9.60	97.44			
		highly micaceous 75 degree healed fracture				core run #4	1.16	95
10.82	96.22			10.82	96.22			
		Bottom of boring @ 10.82 meters						

GROUNDWATER DEPTH: 5.30 Meters CAVE-IN DEPTH:5.43 Meters GROUNDWATER ELEVATION: 101.74 @ 10-4-97

GROUNDWATER DEPTH: 5.55 Meters CAVE-IN DEPTH:5.36 Meters GROUNDWATER ELEVATION: 101.49 @ 10-14-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-17 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B627 & B628

BORING LOCATION: Station 246+92, 6.5m lt., NBL Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 105.19 Meters

STREAM / ROAD CROSSING South Fork Rivanna River

SUBSTRUCTURE UNIT: Pier 3

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 10-7-97, 10-8-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE RECOVERY REC (%)
0.00	105.19	TOPSOIL, rootmat, some gravel and sand						
0.15	105.04	Tan micaceous Sandy SILT						
			0.76		104.43			
0.91	104.28	Tan to white decomposed to highly weathered SCHIST/GNEISS		1.22	103.97	8-35-29	0.24	
			1.28		103.91			
		weathered 30 to 80 degree joints				core run #1	0.18	30
1.89	103.30	Tan Clayey SILT, some weathered schist fragments	1.89	1.89	103.30			
2.13	103.06	Tan to white decomposed to highly weathered SCHIST/GNEISS				11-8-20**	0.15	
			2.35	2.35	102.84			
2.83	102.36	weathered 30 to 80 degree joints				core run #2	0.35	44
		Tan SILT, some gravel and mica	3.14	3.14	102.05			
3.60	101.59	Tan to white decomposed to highly weathered SCHIST/GNEISS	3.60	3.60	101.59	5-3-5**	0.18	
			3.90	3.90	101.29	core run #3	0.14	47
		weathered 30 to 80 degree joints				core run #4	0.09	13
4.57	100.62	Brown micaceous fine Sandy SILT	4.57	4.57	100.62	14-25-50/.076**	0.24	
5.18	100.01	Brown to gray decomposed to highly weathered Mica SCHIST	4.95	4.95	100.24			
						core run #5	0.21	18
			6.10	6.10	99.09			
			6.19	6.19	99.00	50/.09**	0.09	
		70 degree fractures				core run #6	0.71	50
				7.62	97.57			
			7.71		97.48	50/.061**	0.06	
7.77	97.42	Bottom of boring @ 7.77 meters		7.77	97.42			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.04 Meters GROUNDWATER ELEVATION: N/A @ 10-11-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.04 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

REMARKS: **used 1-13/16 O.D., 1-3/16 I.D. split spoon, multiply recorded blows X 1.3 for corrected value

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-18 PAGE 1

BORING LOCATION: Station 247+52, 6.5m lt., NBL Const. B/L

BORING ELEVATION: 105.90 Meters

SUBSTRUCTURE UNIT: Pier 4

DATE DRILLED: 10-10-97, 10-11-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	105.90	TOPSOIL, rootmat						
0.15	105.75	Tan micaceous SILT with gray veins	0.76		105.14	4-8-11	0.34	
1.22	104.68	Tan micaceous Silty CLAY with brown veins	1.52	1.22	104.68 / 104.38	5-5-6	0.45	
2.29	103.61	Gray Clayey SILT, some fine sand and mica; trace of gravel or cobbles from 2.90 to 4.42m	2.29	1.98	103.92 / 103.61	3-4-3	0.43	
4.42	101.48	COBBLES, GRAVEL, SAND, SILT	3.05	2.74	103.16 / 102.85	3-3-3	0.40	
6.10	99.80	Brown to light gray highly weathered to slightly weathered Mica SCHIST; 50 to 80 degree fractures highly weathered joints from 6.16 to 6.83 meters	4.57	3.51	102.39 / 101.33	9-14-16	0.21	
			5.33	5.03	100.87 / 100.57			
			6.10		99.80	50/.061	0.06	
			6.16	6.16	99.74	Core run #1	1.10	95
		35 to 80 degree weathered joints	7.32	7.32	98.58	Core run #2	0.67	49
		core intact, no joints	8.69	8.69	97.21	Core run #3	1.50	99
		35 to 40 degree fractures	10.20	10.20	95.70	Core run #4	1.51	99
11.73	94.17	Bottom of boring @ 11.73 meters		11.73	94.17			

GROUNDWATER DEPTH: 1.07 Meters CAVE-IN DEPTH: 3.29 Meters GROUNDWATER ELEVATION: 104.83 @ 10-13-97

GROUNDWATER DEPTH: 1.13 Meters CAVE-IN DEPTH: 3.29 Meters GROUNDWATER ELEVATION: 104.77 @ 10-15-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-19 PAGE 1

BORING LOCATION: Station 248+12, 6.5 meters lt. NBL Const. C/L

BORING ELEVATION: 114.37 Meters

SUBSTRUCTURE UNIT: Pier 5

DATE DRILLED: 10-12-97, 10-13-97

LOGGED BY: B. Mills

DIAMOND CORE SIZE: NQ, wire line

STRATA (Meters)	DEPTHS	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00		114.37	TOPSOIL, rootmat						
0.15		114.22							
			Brown micaceous SILT, some very fine sand	0.76		113.61	9-13-13	0.21	
					1.22	113.15			
				1.52		112.85	11-20-19	0.21	
					1.98	112.39			
				2.29		112.08	7-9-8	0.15	
					2.74	111.63			
3.05		111.32	Gray micaceous SILT, some fine sand	3.05		111.32	5-21-50/.030	0.24	
3.38		110.99	Light gray to dark gray coarse-grained Mica SCHIST/GNEISS	3.38	3.38	110.99			
			60 to 70 degree fractures				Core run #1	1.50	95
			Dark gray coarse-grained GNEISS	4.96	4.96	109.41			
			50 to 75 degree weathered joints				Core run #2	1.32	87
6.48		107.89	Bottom of boring @ 6.48 meters		6.48	107.89			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 7.5 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 7.5 Meters GROUNDWATER ELEVATION: N/A @ 10-20-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-20 PAGE 1

BORING LOCATION: Station 248+56, 6.5 meters lt. NBL Const. C/L

BORING ELEVATION: 124.84 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 10-14-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	124.84	TOPSOIL, rootmat,						
0.15	124.69	Brown SILT, some sand and mica	0.76	0.88	124.08 123.96	50/.12	0.09	
1.07	123.77	Tan Sandy SILT with gray veins, some mica	1.52	1.62	123.32 123.22	50/.09	0.09	
			2.29	2.59	122.55 122.25	21-50/.15	0.27	
2.90	121.94	Tan SILT with gray veins, some sand and mica	3.05	3.51	121.79 121.33	32-38-33	0.27	
3.81	121.03	Gray Sandy SILT, some mica and weathered rock fragments	4.57	4.82	120.27 120.02	42-50/.24	0.24	
6.22	118.62	Bottom of boring @ 6.22 meters	6.09	6.22	118.75 118.62	50/.122	0.12	

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.08 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.05 Meters GROUNDWATER ELEVATION: N/A @ 10-20-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-21 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B627 & B628

BORING LOCATION: Station 245+41, 10.5m rt., NBL Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 136.58 Meters

STREAM / ROAD CROSSING South Fork Rivanna River

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 10-1-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	136.58	TOPSOIL, rootmat						
0.15	136.43							
		Reddish-tan SILT, trace of clay and mica	0.76		135.82	8-13-15	0.30	
1.22	135.36			1.22	135.36			
		Reddish-tan SILT with gray veins, trace of mica	1.52		135.06	5-8-10	0.24	
				1.98	134.60			
2.44	134.14		2.29		134.29	5-11-12	0.30	
		Tan SILT, some mica		2.74	133.84			
3.35	133.23		3.05		133.53	6-8-8	0.30	
		Tan SILT, some weathered rock fragments and mica		3.50	133.08			
4.42	132.16							
		Gray SILT, some weathered rock fragments	4.57		132.01	26-12-11		
4.72	131.86			5.03	131.55			
		Tan micaceous SILT grinding @ 5.09m						
5.18	131.40		5.18		131.40			
		0 to 60 degree weathered joints				core run #1	0.61	66
		completely weathered (soil) from 6.37 to 7.01m, and from 7.17 to 7.27m	6.10	6.10	130.48			
		25 degree weathered joints				core run #2	0.55	60
		Brown to light gray very highly weathered Mica SCHIST	7.01	7.01	129.57			
		0 to 60 degree weathered joints				core run #3	0.15	16
			7.92	7.92	128.66	50/.12**	0.12	
			8.04	8.04	128.54			
		0 to 60 degree weathered joints				core run #4	0.52	66
		highly weathered below 8.84 meters	8.83	8.83	127.75			
		25 degree weathered joints				core run #5	0.76	83
			9.75	9.75	126.83			
		25 degree weathered joints				core run #6	0.81	88
10.67	125.91			10.67	125.91			
		BOTTOM OF BORING @ 10.67 METERS						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.24 Meters GROUNDWATER ELEVATION: N/A @ 10-2-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.11 Meters GROUNDWATER ELEVATION: N/A @ 10-3-97

REMARKS: **used 1-13/16 O.D., 1-3/16 I.D. split spoon, multiply recorded blows X 1.3 for corrected value

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-22 PAGE 1

BORING LOCATION: Station 245+79, 10.5m rt., NBL Const. B/L

BORING ELEVATION: 129.66 Meters

SUBSTRUCTURE UNIT: Pier 1

DATE DRILLED: 10-2-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE RES REC (%)
0.00	129.66	TOPSOIL, rootmat and boulders						
0.15	129.51	Tan SILT, some mica	0.76	1.22	128.90 128.44	7-7-14	0.21	
1.67	127.99	grinding from 1.67 to 2.68m Tan decomposed SCHIST	1.52	1.74	128.14 127.92	25-50/.06	0.15	
			2.29	2.44	127.37 127.22	50/0.15	0.12	
		grinding from 2.89 to 3.35m	3.05	3.17	126.61 126.49	50/.12	0.12	
		grinding from 4.33 to 4.54m	3.81	4.27	125.85 125.39	17-23-35	0.18	
		grinding from 5.33 to 5.79m	4.57	5.03	125.09 124.63	11-9-8	0.21	
			6.10	6.34	123.56 123.32	40-50/.09	0.21	
6.55	123.11	Brown highly weathered SCHIST						
			7.62	7.92	122.04 121.74	32-50/.15	0.15	
		grinding from 8.23 to 8.38m grinding from 8.84 to 9.60m	9.14	9.17	120.52 120.49	50/.03	0.03	
10.76	118.90	grinding from 10.05 to 10.76m UNABLE TO PENETRATE @ 10.76 METERS	10.67	10.70	118.99 118.96	50/.03	0.00	

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 9.51 Meters GROUNDWATER ELEVATION: N/A @ 10-3-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 9.39 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 45C,hollow-stem augers, automatic hammer

BORING NO: TB-23 PAGE 1

BORING LOCATION: Station 246+32, 10.5m rt., NBL Const. B/L

BORING ELEVATION: 108.12 Meters

SUBSTRUCTURE UNIT: Pier 2

DATE DRILLED: 11-4-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: NWD-4

STRATA DEPTHS (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	108.12	TOPSOIL, rootmat	0.00						
0.15	107.97	Brown micaceous Sandy SILT, some weathered schist fragments		0.76		107.36	2-4-3	0.46	
			1.10		1.22	106.90			
				1.52		106.60	5-13-50/.14	0.35	
		UNABLE TO PENETRATE @ 2.07 METERS			1.97	106.15			
2.07	106.05		2.20	2.07		106.05			
		30 to 70 degree weathered joints					core run #1	1.43	94
		Light gray to dark gray medium to coarse-grained Mica SCHIST	3.30	3.59	3.59	104.53			
		50 to 65 degree weathered joints					core run #2	93.00	92
		weathered zones @ 2.67m, 4.10m, and 4.31	4.40	4.60	4.60	103.52			
		core intact, no fractures					core run #3	0.58	100
		completely weathered (soil) zone from 5. to 5.75 meters	5.50	5.18	5.18	102.94			
		60 degree joints					core run #4	1.46	96
			6.60	6.70	6.70	101.42			
		core intact, no fractures	7.70				core run #5	1.52	100
		grades into more coarse-grained @ 8.28 meters 50 to 80 degree weathered fractures		8.22	8.22	99.90	core run #6	0.57	100
		minor solutioning @ 8.7 meters	8.80	8.80	8.80	99.32			
		70 degree weathered joint					core run #7	0.91	97
			9.90	9.75	9.75	98.37			
		70 degree joint					core run #8	1.52	100
11.27	96.85		11.00		11.27	96.85			
		Bottom of boring @ 11.27 meters							

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-24 PAGE 1

BORING LOCATION: Station 246+92, 10.5m rt., NBL Const. B/L

BORING ELEVATION: 105.33 Meters

SUBSTRUCTURE UNIT: Pier 3

DATE DRILLED: 10-8-97, 10-9-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	105.33	TOPSOIL, rootmat						
0.15	105.18	Tan SILT, some gravel, sand and mica						
			0.76		104.57	8-9-9	0.21	
				1.22	104.11			
			1.52		103.81	3-3-4	0.24	
				1.98	103.35			
			2.29		103.04	3-3-4	0.24	
				2.74	102.59			
			3.05		102.28	4-2-3	0.21	
3.66	101.67	layer of cobbles from3.96 to 4.27 meters		3.51	101.82			
		Brown SILT, some boulder fragments and mica	3.81		101.52	18-18-11	0.15	
				4.27	101.06			
4.88	100.45	Decomposed to highly weathered SCHIST	4.57		100.76	6-14-50/.152	0.24	
				5.03	100.30			
5.58	99.75	Dark gray highly micaceous SCHIST	5.58	5.58	99.75	50/0.00	0.00	
		stained 70 degree joints				core run #1	0.82	100
			6.40	6.40	98.93			
		stained 70 degree joints				core run #2	1.19	91
			7.71	7.71	97.62			
		Brown to light gray highly weathered Mica SCHIST						
		30 to 55 degree joints				core run #3	0.73	48
			9.23	9.23	96.10			
		weathered joints				core run #4	0.30	67
9.69	95.64			9.69	95.64			
		Bottom of boring @ 9.69 meters						

GROUNDWATER DEPTH: 3.51 Meters CAVE-IN DEPTH: 3.81 Meters GROUNDWATER ELEVATION: 101.82 @ 10-11-97

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 3.63 Meters GROUNDWATER ELEVATION: N/A @ 10-14-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-25 PAGE 1

BORING LOCATION: Station 247+52, 10.5m rt., NBL Const. B/L

BORING ELEVATION: 106.05 Meters

SUBSTRUCTURE UNIT: Pier 4

DATE DRILLED: 10-9-97, 10-10-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	106.05	TOPSOIL, rootmat						
0.15	105.90							
		Tan micaceous SILT with gray veins, some fine sand	0.76		105.29	1-2-3	0.37	
				1.22	104.83			
			1.52		104.53			
2.13	103.92							
				1.98	104.07	3-4-5	0.46	
		Gray fine Sandy SILT, some mica	2.29		103.76	1-5-10	0.46	
				2.74	103.31			
		trace of gravel and cobbles from 3.35 to 5.49m	3.05		103.00			
						3-3-2	0.46	
				3.51	102.54			
			3.81		102.24	2-5-5	0.15	
				4.27	101.78			
4.57	101.48		4.57		101.48			
		Tan Sandy SILT, some boulder and cobble fragments				13-15-13	0.15	
				5.03	101.02			
6.10	99.95		6.10		99.95	50/.15	0.15	
		Decomposed SCHIST		6.25	99.80			
7.28	98.77		7.28		98.77			
		Brown to light gray highly weathered to completely weathered SCHIST				Core run #1	0.00	0
			8.08	8.08	97.97			
		65 degree fractures				Core run #2	0.04	7
			8.69	8.69	97.36	26-50/.061**		
			8.90	8.90	97.15			
		60 to 70 degree fractures				Core run #3	0.61	87
			9.60	9.60	96.45			
		solutioning below 9.75m				Core run #4	0.42	95
		60 to 70 degree fractures	10.05	10.05	96.00			
						Core run #5	0.61	56
			11.13	11.13	94.92	Core run #6	0.21	71
		highly micaceous below 11.13 meters	11.43	11.43	94.62			
		75 degree fractures				Core run #7	1.01	66
			12.65	12.65	93.40			
		55 to 85 degree weathered joints				Core run #8	1.46	96
14.17	91.88			14.17	91.88			
		Bottom of boring @ 14.17 meters						

GROUNDWATER DEPTH: 0.64 Meters CAVE-IN DEPTH: 3.20 Meters GROUNDWATER ELEVATION: 105.41 @ 10-11-97

GROUNDWATER DEPTH: 0.67 Meters CAVE-IN DEPTH: 2.93 Meters GROUNDWATER ELEVATION: 105.38 @ 10-15-97

REMARKS: **used 1-13/16 O.D., 1-3/16 I.D. split spoon, multiply recorded blows X 1.3 for corrected value

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-26 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B627 & B628

BORING LOCATION: Station 248+17, 4.35 meters rt. NBL Const. C/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 115.96 Meters

STREAM / ROAD CROSSING South Fork Rivanna River

SUBSTRUCTURE UNIT: Pier 5

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 10-13-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: NQ, wire line

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	115.96	TOPSOIL, rootmat, boulders						
0.15	115.81							
		Brown micaceous Silty SAND	0.76		115.20			
						13-21-27	0.24	
				1.22	114.74			
			1.52		114.44			
						19-24-30	0.37	
				1.98	113.98			
2.29	113.67		2.29		113.67			
		Tan micaceous SILT, some sand				11-14-50/.122	0.21	
				2.74	113.22			
2.90	113.06		2.90	2.90	113.06	50/0.00	0.00	
		25 to 40 degree weathered joints				Core run #1	0.61	100
			3.51	3.51	112.45			
		Light gray to dark gray very highly weathered to slightly weathered Mica SCHIST						
		50 to 70 degree fractures				Core run #2	1.30	86
			5.03	5.03	110.93			
		30 degree fractures darker (almost black) coarse-grained				Core run #3	1.31	86
			6.55	6.55	109.41			
		50 to 60 degree weathered joints brown completely weathered zone from 7.13 to 7.50 meters, fresh rock above and below				Core run #4	1.37	90
8.08	107.88			8.08	107.88			
		Bottom of boring @ 8.08 meters						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 3.72 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 3.72 Meters GROUNDWATER ELEVATION: N/A @ 10-20-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B627 & B628

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING South Fork Rivanna River

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 550,hollow-stem augers, manual hammer

BORING NO: TB-27 PAGE 1

BORING LOCATION: Station 248+56, 10.5 meters rt. NBL Const. C/L

BORING ELEVATION: 126.14 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 10-13-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE REC (%)
0.00	126.14	TOPSOIL, rootmat.						
0.15	125.99	Tan micaceous SILT, some weathered rock fragments						
			0.76		125.38	10-17-17	0.30	
				1.22	124.92			
1.52	124.62	Tan highly micaceous SILT (decomposed SCHIST)	1.52		124.62	33-50/.122	0.24	
				1.80	124.34			
			2.29		123.85	26-34-40	0.30	
				2.74	123.40			
3.20	122.94	Decomposed SCHIST, slightly micaceous	3.05		123.09	29-41-50/.122	0.37	
				3.47	122.67			
3.81	122.33	Decomposed to highly weathered SCHIST	3.81		122.33	50/.061	0.06	
				3.87	122.27			
			4.57		121.57	50/.030	0.00	
				4.60	121.54			
6.16	119.98	Bottom of boring @ 6.16 meters	6.10		120.04	50/.061	0.06	
				6.16	119.98			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 16.6 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 16.5 Meters GROUNDWATER ELEVATION: N/A @ 10-20-97

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501, B635

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

BORING NO: TB-28 PAGE 1

BORING LOCATION: Station 16+50, 10m lt. Ramp A Const. B/L

BORING ELEVATION: 187.45 Meters

SUBSTRUCTURE UNIT: Abutment A

DATE DRILLED: 7-8-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	187.45	TOPSOIL	0.00						
0.24	187.21	Reddish-brown to tan SILT, trace of sand and mica							
0.91	186.54	Tan and gray decomposed Mica SCHIST, with some layers of brown silty clay	1.50	1.52	185.93	10-43-28	0.46		
				1.98	185.47				
			3.00	3.05	184.40	16-50/.076	0.21		
				3.28	184.17				
4.57	182.88	Tan and gray highly weathered Mica SCHIST	4.50	4.57	182.88	50/.09	0.09		
				4.66	182.79				
			6.00	6.10	181.35	50/.03	0.03		
				6.13	181.32				
			7.50	7.62	7.62	179.83	50/0	0.00	
			9.00	9.14	9.14	178.31	50/0	0.00	
10.67	176.78	Bottom of boring @ 10.67 meters	10.50	10.67	10.67	176.78	50/0	0.00	
			12.00						
			13.50						
			15.00						

GROUNDWATER DEPTH: 7.01 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 180.44 @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-30 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 17+46, 10m lt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 185.07 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 2

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 7-2-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	185.07	TOPSOIL 0.00							
0.3	184.77	Reddish-brown Clayey SILT, some mica, trace of sand							
0.61	184.46	Tan and gray decomposed Mica SCHIST, with some layers of brown silty clay 1.50							
		3.00							
4.42	180.65	Gray highly weathered Mica SCHIST 4.50	4.42		180.65				
		25 to 85 degree fractures weathering in joints				Core run #1	1.43	98	61
		6.00	5.88	5.88	179.19				
		45 to 50 degree fractures weathering in joints				Core run #2	1.51	99	99
		7.50	7.40	7.40	177.67				
		65 to 75 degree fractures weathering in joints				Core run #3	1.49	98	98
8.92	176.15	9.00		8.92	176.15				
		Bottom of boring @ 8.92 meters							
		10.50							
		12.00							
		13.50							
		15.00							

GROUNDWATER DEPTH: 6.19 Meters CAVE-IN DEPTH: 7.28 Meters GROUNDWATER ELEVATION: 178.88 @ 24 Hours

REMARKS: dense material between 0.91 and 1.83 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-31 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 17+93, 10m lt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 189.68 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 3

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-25-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: NX

STA DEPTH (Meters)	STA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	189.68	TOPSOIL 0.00							
0.30	189.38	Reddish-tan micaceous SILT							
1.22	188.46	Tan micaceous SILT, some weathered rock fragment 1.50							
2.23	187.45	Gray and tan decomposed to highly weathered Mica SCHIST 3.00							
		4.50							
		6.00							
		7.50	7.62	7.62	182.06	50/0	0.00		
		9.00	9.14	9.14	180.54	50/0	0.00		
9.17	180.51	Gray and tan Mica SCHIST	9.17		180.51				
		very highly weathered to decomposed 37 to 55 degree joints weathered joints 10.50				Core run #1	1.41	75	82
			10.69	10.69	178.99				
		very highly weathered very highly micaceous 40 to 55 degree fractures 12.00				Core run #2	1.51	99	90
			12.21	12.21	177.47				
		highly weathered 30 to 40 degree fractures 13.50				Core run #3	1.52	100	95
13.73	175.95			13.73	175.95				
		Bottom of boring @ 13.73 meters 15.00							

GROUNDWATER DEPTH: 7.00 Meters CAVE-IN DEPTH: 8.6 Meters GROUNDWATER ELEVATION: 182.68 @ 24 Hours

REMARKS: dense material between 2.23 and 9.17 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-33 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 18+82.6, 10m lt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 187.32 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 5

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-27-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-55, hollow-stem augers, manual hammer

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	187.32	TOPSOIL	0.00							
0.15	187.17	Reddish-tan micaceous SILT								
1.06	186.26	Tan micaceous SILT, some quartz fragments								
1.37	185.95		1.50	1.52	1.63	185.80 185.69	50/.11	0.10		
		Gray and tan highly weathered Mica SCHIST	3.00	3.05	3.08	184.27 184.24	50/.03	0.03		
4.63	182.69		4.50	4.57	4.63	182.75 182.69	50/.06	0.06		
		UNABLE TO PENETRATE @ 4.63 METERS								
			6.00							
			7.50							
			9.00							
			10.50							
			12.00							
			13.50							
			15.00							

GROUNDWATER DEPTH: 1.70 Meters CAVE-IN DEPTH: 3.2 Meters GROUNDWATER ELEVATION: 185.62 @ 24 Hours

REMARKS: tight below 1.5 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-34 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 19+48, 10m lt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 199.87 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 6

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-7-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	199.87	TOPSOIL	0.00						
0.08	199.79	Reddish-tan micaceous Clayey SILT, trace of sand							
			1.50						
1.83	198.04	Tan micaceous Clayey SILT, trace of sand							
2.59	197.28	Gray and tan decomposed Mica SCHIST	3.00						
4.57	195.30	Gray and tan highly weathered Mica SCHIST	4.50						
			6.00						
			7.50						
			9.00						
				10.67	189.20	50/0	0.00		
			10.50						
				12.19	187.68	50/.02	0.06		
				12.21	187.66				
			12.00						
13.72	186.15	Gray decomposed highly micaceous SCHIST		13.71	186.16	50/.137	0.24		
				13.86	186.01				
			13.50						
				15.24	184.63	42-50/.061	0.29		
15.45	184.42			15.45	184.42				
		Bottom of boring @ 15.45 meters	15.00						

GROUNDWATER DEPTH: 6.40 Meters CAVE-IN DEPTH: 11.65 Meters GROUNDWATER ELEVATION: 193.47 @ 24 Hours

REMARKS: density decreasing below 13.7 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-35 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 20+11, 10m lt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 205.47 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 7

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-14-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: J. R. Finks

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: NX

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	205.47	TOPSOIL							
0.12	205.35	Reddish-brown Clayey SILT, trace of sand and mica							
0.70	204.77	Tan decomposed SCHIST							
1.77	203.70	30 - 50 degree fractures	1.77		203.70	Core run #1	1.17	96	81
		Gray highly weathered to very highly weathered Mica SCHIST							
		45 - 90 degree fractures	2.99	2.99	202.48	Core run #2	1.40	96	90
		20 - 40 degree fractures	4.45	4.45	201.02	Core run #3	0.84	55	44
		30 degree fractures	5.97	5.97	199.50	Core run #4	1.47	97	95
		40 - 90 degree fractures	7.49	7.49	197.98	Core run #5	1.43	94	94
		50 - 60 degree fractures	9.01	9.01	196.46	Core run #6	1.48	97	93
		40 - 50 degree fractures	10.53	10.53	194.94	Core run #7	1.47	97	97
		40 - 60 degree fractures	12.05	12.05	193.42	Core run #8	1.50	99	90
		fine-grained grading into more weathered, coarser grained rock 40 - 55 degree fractures	13.57	13.57	191.90	Core run #9	1.42	93	82
		weathering in joints 50 - 70 degree fractures	15.09	15.09	190.38	Core run #10	1.51	99	95
		40 degree fractures	16.61	16.61	188.86	Core run #11	0.24	16	10
		40 degree fractures	18.13	18.13	187.34	Core run #12	1.34	89	62
		25 - 65 degree fractures	19.65	19.65	185.82	Core run #13	1.33	87	64
21.17	184.30			21.17	184.30				
		Bottom of boring @ 21.17 meters							

GROUNDWATER DEPTH: 14.05 Meters CAVE-IN DEPTH: 15.5 Meters GROUNDWATER ELEVATION: 191.42 @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501, B635

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

BORING NO: TB-36 PAGE 1

BORING LOCATION: Station 20+50, 10m lt. Ramp A Const. B/L

BORING ELEVATION: 201.23 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 5-13-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	201.23	TOPSOIL	0.00							
0.30	200.93	Reddish-brown Clayey SILT, trace of sand and mica								
1.52	199.71	Gray and tan decomposed Mica SCHIST	1.50	1.52	1.98	199.71 199.25	5-11-18	0.46		
			3.00	3.05	3.35	198.18 197.88	25-50/.152	0.22		
			4.50	4.57	4.71	196.66 196.52	50/.137	0.14		
			6.00	6.10	6.22	195.13 195.01	50/.122	0.09		
			7.50	7.62	7.71	193.61 193.52	50/.091	0.08		
			9.00	9.14	9.41	192.09 191.82	50/.115	0.21		
			10.50	10.67	10.94	190.56 190.29	50/.115	0.14		
			12.00	12.19	12.33	189.04 188.90	50/.137	0.11		
			13.50	13.72	13.84	187.51 187.39	40-50/.061	0.13		
13.84	187.39	Bottom of boring @ 13.84 meters								
			15.00							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/ GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-39 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 17+46, 2.5m rt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 184.46 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 2

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-30-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: NX

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	184.46	TOPSOIL 0.00							
0.30	184.16	Reddish-brown Clayey SILT, trace of sand and mica							
1.16	183.30	Tan SILT, some sand and mica 1.50							
1.52	182.94	Gray and tan decomposed Mica SCHIST							
		3.00							
		4.50							
			6.10		178.36	50/.03	0.00		
				6.13	178.33				
6.83	177.63	Gray and tan Mica SCHIST	6.83		177.63				
		50 to 70 degree fractures very coarse weathered zone from 7.4 to 7.51 meters				Core run #1	1.42	97	97
		very highly micaceous from 7.51 to 8.0 meters	8.29	8.29	176.17				
		40 to 90 degree fractures core intact				Core run #2	1.51	99	99
9.81	174.65			9.81	174.65				
		Bottom of boring @ 9.81 meters							
		12.00							
		13.50							
		15.00							

GROUNDWATER DEPTH: 3.30 Meters CAVE-IN DEPTH: 6.1 Meter GROUNDWATER ELEVATION: 181.16 @ 24 Hours

REMARKS: extremely hard between 5.3 and 6.8 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-40 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 17+93, 2.5m lt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 189.26 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 3

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-24-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	189.26	TOPSOIL	0.00						
0.24	189.02	Reddish-brown Clayey SILT, trace of sand and mica							
			1.50						
1.83	187.43	Tan to reddish-tan micaceous SILT, trace of sand							
2.90			3.00						
		Gray and tan decomposed Mica SCHIST							
			4.50						
			6.00	6.19	183.07	50/.091	0.09		
				6.19	183.07				
			7.50	7.62	181.64	50/0	0.00		
			9.00	9.14	180.12	50/0	0.00		
			10.50	10.67	178.59	50/0	0.00		
			12.00						
12.19	177.07			12.19	177.07	50/0	0.00		
		Bottom of boring @ 12.19 meters							
			13.50						
			15.00						

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: 7. GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: hard drilling below 2.9 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-41 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 18+38, 5.5m rt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 193.16 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 4

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-28-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	193.16	TOPSOIL	0.00						
0.04	193.12	Reddish-brown SILT, trace of sand and mica							
0.60	192.56	Reddish-brown Clayey SILT, trace of sand and mica							
1.22	191.94	Tan micaceous SILT, trace of sand							
2.43	190.73		3.00						
		Tan decomposed Mica SCHIST	4.50						
			6.00	6.10	187.06	50/.025	0.00		
				6.13	187.03				
7.62	185.54		7.50	7.62	185.54	50/.122	0.12		
		Gray and tan highly weathered Mica SCHIST		7.74	185.42				
9.14	184.02		9.00	9.14	9.14	184.02	50/0	0.00	
		UNABLE TO PENETRATE @ 9.14 METERS							
			10.50						
			12.00						
			13.50						
			15.00						

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: 7. GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: boring offset and elevation adjusted. less dense between 6.86 and 7.9 meters. moisture in hole @ 9.14

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-42 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 18+82.6, 2.5m rt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 186.58 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 5

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-27-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-55, hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	186.58	TOPSOIL, some crushed aggregate							
0.30	186.28	Reddish-brown Clayey SILT, some mica							
1.06	185.52	Tan micaceous SILT, trace of sand	1.52		185.06				
1.67	184.91	Gray decomposed Mica SCHIST		1.72	184.86	26-50/.05	0.15		
1.98	184.60	Gray highly weathered Mica SCHIST							
3.05	183.53	**UNABLE TO PENETRATE @ 3.05 METERS**	3.05	3.05	183.53	50/0	0.00		

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: backfilled upon completion

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501, B635

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

DRILL / METHOD USED: CME-45, hollow-stem augers, automatic hammer

BORING NO: TB-43 PAGE 1

BORING LOCATION: Station 19+48, 2.5m rt. Ramp A Const. B/L

BORING ELEVATION: 197.53 Meters

SUBSTRUCTURE UNIT: Pier 6

DATE DRILLED: 5-27-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: n/a

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	197.53	TOPSOIL							
0.08	197.45	Reddish-tan SILT, trace of fine sand, mica, and clay							
1.22	196.31	Gray SILT, trace of fine sand and mica							
5.20	192.33	Gray decomposed to highly weathered Mica SCHIST	7.62	7.80	189.91 189.73	29-59/.09	0.15		
8.20	189.33	Gray highly weathered Mica SCHIST	9.14	9.17	188.39 188.36	50/.03	0.03		
10.10	187.43	**UNABLE TO PENETRATE @ 10.1 METERS**							

GROUNDWATER DEPTH: 6.75 Meters CAVE-IN DEPTH: 7.8 GROUNDWATER ELEVATION: 190.78 @ 24 Hours

REMARKS: very tight below 8.2 meters, grinding below 9.3 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-44 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 20+08, 0.37m rt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 203.46 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Pier 7

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-9-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	203.46	TOPSOIL 0.00							
0.30	203.16	Reddish-brown Clayey SILT, trace of sand and mica							
0.91	202.55	Tan micaceous SILT, trace of sand and rock fragments 2.00							
1.98	201.48	Tan micaceous Sandy SILT, some weathered rock fragments							
		6.00							
		8.00							
		10.00							
10.67	192.79	Mixed gray and tan weathered Mica SCHIST							
		12.00	12.19	12.29	191.27 / 191.17	50/.11	0.12		
			13.72	13.76	189.74 / 189.70	50/.04	0.05		
		14.00	15.24	15.58	188.22 / 187.88	18-38-50/.04	0.34		
16.00	187.46	16.00							
		UNABLE TO PENETRATE @ 16 METERS							
		18.00							
		20.00							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: grinding at 1.98 to 2.59 meters, boring offset and elevation adjusted

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-45 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B635

BORING LOCATION: Station 20+50, 2.5m rt. Ramp A Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 198.86 Meters

STREAM / ROAD CROSSING Route 250 Ramp A to NBL Route 29 Bypass

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-12-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	198.86	TOPSOIL							
0.24	198.62	Reddish-brown Clayey SILT, trace of sand and mica							
0.91	197.95	Tan to gray decomposed to highly weathered Mica SCHIST	1.52	1.82	197.34 197.04	32-50/.152	0.24		
			3.05	3.34	195.81 195.52	28-50/.137	0.19		
			4.57	4.81	194.29 194.05	39-50/.092	0.16		
			6.10	6.55	192.76 192.31	21-22-21	0.46		
			7.62	7.71	191.24 191.15	50/.09	0.13		
			9.14	9.20	189.72 189.66	50/.061	0.08		
10.58	188.28	**UNABLE TO PENETRATE @ 10.58 METERS**							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 7.55 GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: hard zone between 8.23 and 10.58 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-55 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B636

BORING LOCATION: Station 158+71.7, 13.1m lt. Route 29 Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 189.69 Meters

STREAM / ROAD CROSSING Route 29 Bypass over Route 250

SUBSTRUCTURE UNIT: Pier

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-4-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: J. R. Finks

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: NX

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	189.69	TOPSOIL							
0.30	189.39	Reddish-brown Clayey SILT, trace of sand and mica							
0.76	188.93	Reddish-brown to tan micaceous SILT, some sand							
1.83	187.86	Reddish-brown micaceous SILT, trace of sand							
2.13	187.56	Gray highly weathered to very highly weathered Mica SCHIST							
9.72	179.97	Dark gray to gray weathered to highly weathered Mica SCHIST — 40 degree fractures	9.72		179.97	Core run #1			
		30 - 90 degree fractures	10.49	10.49	179.20	Core run #2			
		5 - 30 degree fractures	12.01	12.01	177.68	Core run #3	1.16	100	95
		light gray to white — minor solution cavities, 65 degree fractures	13.17	13.17	176.52	Core run #4	0.34	94	85
		40 - 85 degree fractures, weathered joints	13.53	13.53	176.16	Core run #5	1.40	92	87
		40 - 80 degree fractures	15.06	15.06	174.63	Core run #6	1.52	100	90
		55 degree fractures	16.58	16.58	173.11	Core run #7	1.52	100	100
18.11	171.58	Bottom of boring @ 18.11 meters		18.11	171.58				

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: extremely hard from 4.57 to 9.72 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-56 PAGE 1

PROJECT NO: 6029-002-F22, PE101, CS01, B636

BORING LOCATION: Station 159+05.7, 13.1m lt. Route 29 Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 192.28 Meters

STREAM / ROAD CROSSING Route 29 Bypass over Route 250

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-30-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: N/A

STRATA (Meters)	DEPTH (Meters)	STRATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM	DEPTH TO	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00		192.28	TOPSOIL	0.00						
0.24		192.04	Reddish-brown Clayey SILT, trace of sand and mica							
1.22		191.06	Gray and tan highly weathered Mica SCHIST	1.50	1.52	190.76	50/.152	0.14		
1.64		190.64	Reddish-brown Silty CLAY, trace of sand		1.67	190.61				
1.67		190.61	Gray and tan highly weathered Mica SCHIST							
3.05			Reddish-brown Clayey SILT, trace of sand and mica	3.00	3.05	189.23	5-20-47	0.46		
3.20		189.08	Gray and tan highly weathered Mica SCHIST		3.51	188.77				
				4.50	4.57	187.71	50/0	0.00		
				6.00	6.10	186.18	50/.045	0.03		
					6.14	186.14				
				7.50	7.62	184.66	50/.045	0.00		
					7.67	184.61				
				9.00	9.14	183.14	50/.015	0.00		
					9.16	183.12				
				10.50	10.67	181.61	50/.015	0.00		
					10.69	181.59				
				12.00	12.19	180.09	50/.03	0.00		
					12.22	180.06				
				13.50	13.72	178.56	50/.03	0.00		
13.75		178.53			13.75	178.53				
			Bottom of boring @ 13.75 meters							
				15.00						

GROUNDWATER DEPTH: 7.53 Meters CAVE-IN DEPTH: 10.97 Meters GROUNDWATER ELEVATION: 184.75 @ 24 Hours

REMARKS: extremely hard from 1.67 to 2.29 meters, auger return was wet when drilling between 12.19 and 12.95 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-57 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B636

BORING LOCATION: Station 158+47.9, 13.1m rt. Route 29 Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 187.92 Meters

STREAM / ROAD CROSSING Route 29 Bypass over Route 250

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-12-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORING RESULTS REC (%)	R.Q.D. (%)
0.00	187.92	TOPSOIL	0.00							
0.30	187.62	Brown Sandy SILT, trace of mica								
0.76	187.16	Tan SILT, some sand and mica								
1.37	186.55	Gray and tan highly weathered Mica SCHIST	1.50	1.52	1.98	186.40 185.94	20-34-42	0.14		
		some veins of reddish-brown clayey silt to four meters depth	3.00	3.05	3.51	184.87 184.41	13-15-21	0.46		
			4.50	4.57	4.70	183.35 183.22	50/.13	0.13		
			6.00	6.10	6.16	181.82 181.76	50/.061	0.06		
			7.50	7.62	7.64	180.30 180.28	50/.015	0.00		
			9.00	9.14	9.16	178.78 178.76	50/.015	0.00		
9.16	178.76	Bottom of boring @ 9.16 meters	10.50	10.67	10.69	177.25 177.23	50/.015	0.00		
			12.00	12.19	12.22	175.73 175.70	50/.03	0.00		
			13.50	13.72	13.75	174.20 174.17	50/.03	0.00		
			15.00							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 6.90 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: hard drilling from 5.33 to 9.16 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-58 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B636

BORING LOCATION: Station 158+77.7, 13.1m rt. Route 29 Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 190.24 Meters

STREAM / ROAD CROSSING Route 29 Bypass over Route 250

SUBSTRUCTURE UNIT: Pier

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 6-19-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: AX

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	190.24	TOPSOIL							
0.30	189.94	Reddish-tan Clayey SILT, some mica, trace of sand							
0.76	189.48	Gray and tan decomposed Mica SCHIST							
			15.24	15.24	175.00	50/0	0.00		
15.94	174.30	Light gray to medium gray medium to coarse grained Mica SCHIST	15.94	15.94	174.30	Core run #1	0.41	95	0*
			16.37	16.37	173.87	Core run #2	1.45	95	0*
			17.89	17.89	172.35	Core run #3	1.45	95	85
19.41	170.83	Bottom of boring @ 19.41 meters		19.41	170.83				

GROUNDWATER DEPTH: 10.55 Meters CAVE-IN DEPTH: 12.45 Meters GROUNDWATER ELEVATION: 179.69 @ 24 Hours

REMARKS: * used AX core barrel, cores broke into 1.5 to 2-inch segments

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 Charlottesville Bypass

BORING NO: TB-59 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501, B636

BORING LOCATION: Station 159+11.9, 13.1m rt. Route 29 Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 192.40 Meters

STREAM / ROAD CROSSING Route 29 Bypass over Route 250

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: N/A, boring data supplied by Contract Surveyor

DATE DRILLED: 5-29-97

BENCHMARK ELEVATION: N/A, boring data supplied by Contract Surveyor

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION		DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	192.40	TOPSOIL	0.00							
0.30	192.10	Reddish-brown Clayey SILT, trace of sand and mica								
1.52	190.88		1.50	1.52	1.98	190.88 190.42	4-5-8	0.46		
1.83	190.57	Red and tan micaceous SILT, trace of sand								
		Gray and tan decomposed to highly weathered Mica SCHIST	3.00	3.05	3.51	189.35 188.89	11-12-11	0.46		
			4.50	4.57	5.03	187.83 187.37	11-29-46	0.46		
			6.00	6.10	6.55	186.30 185.85	17-17-17	0.46		
			7.50	7.62	7.97	184.78 184.43	27-28-50/.046	0.34		
			9.00	9.14	9.18	183.26 183.22	50/.035	0.00		
			10.50	10.67	10.67	181.73	50/0	0.00		
			12.00	12.19	12.21	180.21 180.19	50/.015	0.00		
12.21	180.19	Bottom of boring @ 12.21 meters								
			13.50							
			15.00							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 8.90 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: hard drilling below 9.14 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville bypass

PROJECT NO: 6029-002-F22, PE101, B638

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Old Ivy Road over Route 29/250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnished by contract surveyors

DRILL / METHOD USED: CME-45B, hollow-stem augers, manual hammer

BORING NO: TB-60 PAGE 1

BORING LOCATION: Station 12+00, 9m lt., Old Ivy Rd. Const. B/L

BORING ELEVATION: 171.50 Meters

SUBSTRUCTURE UNIT: Abutment A

DATE DRILLED: 1-16-98, 1-19-98

LOGGED BY: F. E. Coates

DIAMOND CORE SIZE: NQ

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	STD. PENETRATION TEST RESULTS BLOWS	STD. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS [illegible] (%)
0.00	171.50	TOPSOIL	0.00						
0.15	171.35	Reddish-brown Silty CLAY, some mica and sand	0.76	1.22	170.74 / 170.28	3-4-4	0.37		
1.68	169.82	Tan Sandy SILT, some mica	1.52	1.98	169.98 / 169.52	5-4-5	0.46		
2.29	169.21	Tan / brown micaceous SILT, some fine sand	2.29	2.74	169.21 / 168.76	4-4-5	0.46		
			3.05	3.51	168.45 / 167.99	3-3-5	0.46		
4.57	166.93	Tan to brown highly micaceous SILT, some fine sand	4.57	5.03	166.93 / 166.47	2-3-4	0.46		
			6.10	6.55	165.40 / 164.95	4-4-6	0.37		
7.62	163.88	Brown highly micaceous SILT	7.62	8.08	163.88 / 163.42	5-7-9	0.46		
			9.14	9.60	162.36 / 161.90	9-12-15	0.46		
10.67	160.83	Brown highly micaceous SILT, some fine sand	10.67	11.13	160.83 / 160.37	6-11-16	0.37		
0.00									
13.26	158.24	Decomposed GRANITE	12.19	12.65	159.31 / 158.85	28-23-29	0.43		
13.53	157.97	0 to 30 degree joints	13.53	13.53	157.97	50/.012	0.00		
			14.30	14.30	157.20	core run #1	0.70	2.3	[illegible]
		0 to 50 degree joints				core run #2	0.61	22	[illegible]
		Brownish-gray and white moderately weathered to highly weathered Phaneritic GRANITE							
17.04	154.46	45 to 65 degree joints	17.04	17.04	154.46	core run #3	1.43	88	79
		Gray and white moderately weathered Phaneritic GRANITE	18.56	18.56	152.94	core run #4	1.52	100	89
		30 to 65 degree joints							
20.09	151.41	Bottom of boring @ 20.09 meters		20.09	151.41				

GROUNDWATER DEPTH: 6.29 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 165.21 @ 1-20-98

GROUNDWATER DEPTH: 6.26 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 165.24 @ 1-22-98

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B638

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Old Ivy Road over Route 29/250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnishe Meters

DRILL / METHOD USED: CME-45B, hollow-stem augers, manual hammer

BORING NO: TB-61 PAGE 1

BORING LOCATION: Station 12+26.6, 6m lt., Old Ivy Rd. Const. B/L

BORING ELEVATION: 164.67 Meters

SUBSTRUCTURE UNIT: Pier

DATE DRILLED: 2-21-98

LOGGED BY: J. R. Finks

DIAMOND CORE SIZE: NQ

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORING RESULTS REC (%)
0.00	164.67	ASPHALT CONCRETE	0.00					
0.15	164.52	CEMENT TREATED CRUSHED AGGREGATE						
0.61	164.06	Brown micaceous SILT, tr fine sand, rock fragments	0.76		163.91	5-6-8	0.15	
1.22	163.45	Decomposed rock	1.22		163.45	core run #1	0.27	90
2.13	162.54	Mixed white, tan, and brown highly micaceous Decomposed ROCK	2.13	1.52	163.15 162.54	19-21-21	0.27	
			3.05	2.59	162.08 161.62	19-50/.15	0.30	
				3.35	161.32			
4.36	160.31		4.36	4.36	160.31	50/0		
		30 to 70 degree joints				core run #2	1.37	90
		40 - 70 degree joints	5.88	5.88	158.79	core run #3	1.38	90
		Gray and white highly weathered to fresh Phaneritic GRANITE	7.41	7.41	157.26			
		55 to 65 degree joints man-made				core run #4	1.52	100
			8.93	8.93	155.74			
		5 to 85 degree joints				core run #4	1.45	95
10.45	154.22			10.45	154.22			
		bottom of boring @ 10.45 meters						

GROUNDWATER DEPTH: 0.00 Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: n/a @

GROUNDWATER DEPTH: 0.00 Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: n/a @

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville bypass

PROJECT NO: 6029-002-F22, PE101, B638

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Old Ivy Road over Route 29/250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnished by contract surveyors

DRILL / METHOD USED: CME-45D, hollow-stem augers, manual hammer

BORING NO: TB-62 PAGE 1

BORING LOCATION: Station 12+72.8, 7.5m lt., Old Ivy Rd. Const. B/L

BORING ELEVATION: 168.64 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 1-12-98, 1-13-98

LOGGED BY: F. E. Coates

DIAMOND CORE SIZE: NQ

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS RQD (%)
0.00	168.64	TOPSOIL	0.00						
0.15	168.49	Gray SILT, some gravel, sand and mica	0.76		167.88	9-11-12	0.37		
			1.22	1.22	167.42	16-29-30	0.43		
2.13	166.51	Grayish-brown to tan Sandy SILT, some mica		1.68	166.96				
			2.13		166.51	18-12-8	0.46		
				2.59	166.05				
			2.74		165.90	5-12-22	0.46		
				3.20	165.44				
			4.27		164.37	27-19-27	0.37		
				4.72	163.92				
		free water in sampler	5.79		162.85	15-23-30	0.46		
				6.25	162.39				
		mica content increasing	7.32		161.32	12-15-18	0.46		
				7.77	160.87				
10.76	157.88		8.84		159.80	12-17-25	0.43		
		Decomposed rock/quartz		9.30	159.34				
10.97	157.67		10.36		158.28	28-38-50/.12	0.43		
		Bluish-gray and white fresh Phaneritic GRANITE man-made breaks		10.79	157.85				
			10.97		157.67				
		man-made breaks	11.58	11.58	157.06	core run #1	0.37	61	40
		man-made breaks	12.28	12.28	156.36	core run #2	0.76	100	100
		man-made breaks	12.53	12.53	156.11	core run #3	0.09	36	0
14.97	153.67	man-made breaks		14.97	153.67	core run #4	2.38	97	92
		Bottom of boring @ 14.97 meters							

GROUNDWATER DEPTH: 5.66 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 162.98 @ 1-14-98

GROUNDWATER DEPTH: 5.29 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 163.35 @ 1-22-98

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B636

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Old Ivy Road over Route 29/250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnished by contract surveyors

DRILL / METHOD USED: CME-45B, hollow-stem augers, manual hammer

BORING NO: TB-63 PAGE 1

BORING LOCATION: Station 11+98, 10.7m rt., Old Ivy Rd. Const. B/L

BORING ELEVATION: 172.35 Meters

SUBSTRUCTURE UNIT: Abutment A

DATE DRILLED: 1-20-98, 1-21-98

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORING RESULT REC (%)
0.00	172.35	TOPSOIL	0.00					
0.15	172.20	Reddish-brown Silty CLAY, some mica	0.76		171.59	4-4-5	0.46	
1.22	171.13	Reddish-tan micaceous SILT	1.22	1.22	171.13	7-7-8	0.46	
2.29	170.06	Brown micaceous SILT, some sand	2.29	1.68	170.67 / 170.06	3-5-6	0.46	
			2.74	2.74	169.61	3-4-6	0.46	
				3.20	169.15			
			4.27		168.08	3-5-7	0.46	
				4.72	167.63			
5.79	166.56	Tan highly micaceous SILT, some fine sand	5.79		166.56	2-3-3	0.46	
				6.25	166.10			
			7.32		165.03	5-12-14	0.46	
				7.77	164.58			
9.14	163.21	Decomposed rock	8.84		163.51	4-7-10	0.46	
				9.30	163.05			
10.36	161.99	Gray to white slightly weathered to fresh Phaneritic GRANITE	10.17		162.18	37-50/0.03	0.18	
		50 degree joints	10.36	10.36	161.99			
			10.88	10.88	161.47	core run #1	0.43	83
		35 to 60 degree joints				core run #2	2.80	97
			13.78	13.78	158.57			
		30 degree joints				core run #3	1.52	100
			15.30	15.30	157.05			
		25 degree joints				core run #4	1.52	100
16.83	155.52			16.83	155.52			
		Bottom of boring @ 16.83 meters						

GROUNDWATER DEPTH: 4.93 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 167.42 @ 1-22-98

GROUNDWATER DEPTH: 4.80 Meters CAVE-IN DEPTH: 5.0 Meters GROUNDWATER ELEVATION: 167.55 @ 1-27-98

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

PROJECT No: 6029-002-F22, PE101, B630

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Old Ivy Road over Route 29/250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnished by contract surveyors

DRILL / METHOD USED: CME-45B, hollow-stem augers, manual hammer

BORING NO: TB-64 PAGE 1

BORING LOCATION: Station 12+26.2, 0m rt., Old Ivy Rd. Const. B/L

BORING ELEVATION: 165.02 Meters

SUBSTRUCTURE UNIT: Pier

DATE DRILLED: 2-25-98

LOGGED BY: F. E. Coates

DIAMOND CORE SIZE: NQ

STRATA DEPTH (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS
0.00	165.02	ASPHALT CONCRETE	0.00						
0.15	164.87	CEMENT TREATED CRUSHED AGGREGATE							
0.61	164.41	Brown micaceous SILT, tr fine sand, rock fragments	0.76		164.26	6-6-9	0.30		
				1.07	163.95				
1.22	163.80		1.22		163.80	core run #1	0.46	100	
		0 to 60 degree joints	1.68	1.68	163.34				
		0 to 75 degree joints				core run #2	1.43	95	
		Gray and white slightly weathered to fresh Phaneritic GRANITE	3.20	3.20	161.82				
		0 to 80 degree joints				core run #3	1.14	96	
			4.39	4.39	160.63				
		0 to 25 degree joints				core run #4	1.49	96	
			5.94	5.94	159.08				
		25 to 55 degree joints				core run #5	1.13	74	
		highly micaceous and very highly weathered to decomposed between 7.16 and 7.92 meters	7.47	7.47	157.55				
		0 to 25 degree joints				core run #6	1.13	62	
			9.30	9.30	155.72				
		60 degree joints				core run #7	1.52	100	
10.82	154.20			10.82	154.20				
		Bottom of boring @ 10.82 meters							

GROUNDWATER DEPTH: n/a* Meters CAVE-IN DEPTH: n/a* Meter GROUNDWATER ELEVATION: N/A @

GROUNDWATER DEPTH: n/a* Meters CAVE-IN DEPTH: n/a* Meter GROUNDWATER ELEVATION: N/A @

REMARKS: *boring was backfilled upon completion due to location within traffic lane

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B636

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Old Ivy Road over Route 29/250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnishe Meters

DRILL / METHOD USED: CME-45D, hollow-stem augers, manual hammer

BORING NO: TB-65 PAGE 1

BORING LOCATION: Station 12+53.5, 7.5m rt., Ivy Rd. Const. B/L

BORING ELEVATION: 169.81 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 1-14-98, 1-15-98

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: RQD (%)
0.00	169.81	TOPSOIL	0.00						
0.15	169.66	Reddish-brown Silty CLAY, trace of mica	0.76	1.22	169.05 / 168.59	3-5-6	0.46		
0.91	168.90	Reddish-tan Clayey SILT, some sand & mica	1.52	1.98	168.29 / 167.83	4-7-11	0.46		
1.83	167.98	Brown fine Sandy SILT, trace of mica; intermittent veins of reddish-brown silt/clay	2.29	2.74	167.52 / 167.07	9-14-16	0.37		
3.05	166.76	Brown Sandy SILT; intermittent veins of gray silt or clay	3.05	3.51	166.76 / 166.30	10-14-18	0.46		
			4.57	5.03	165.24 / 164.78	16-16-16	0.46		
			6.10	6.55	163.71 / 163.26	5-5-6	0.46		
7.59	162.22	Gray and white slightly weathered to fresh Phaneritic GRANITE; 35 to 80 degree joints; 40 to 80 degree joints; intact core	7.59	7.59	162.22	50/0.0	0.00		
			8.35	8.35	161.46	core run #1	0.64	64	46
			9.88	9.88	159.93	core run #2	1.50	98	92
						core run #3	1.49	98	98
11.40	158.41	Bluish-gray and white fresh Phaneritic GRANITE; man-made breaks; man-made breaks	11.40	11.40	158.41	core run #4	1.40	92	92
			12.92	12.92	156.89	core run #5	1.25	82	82
14.45	155.36	Bottom of boring @14.45 meters		14.45	155.36				

GROUNDWATER DEPTH: 5.84 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 163.97 @ 1-16-98

GROUNDWATER DEPTH: 5.72 Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: 164.09 @ 1-21-98

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

BORING NO: TB-66 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B638

BORING LOCATION: Station 12+37, 8.2m rt., existing CSX RR track

COUNTY / CITY: Albemarle

BORING ELEVATION: 167.34 Meters

STREAM / ROAD CROSSING CSX Railroad over Route 250 Bypass

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: furnished by contract surveyors

DATE DRILLED: 2-12-98, 2-13-98

BENCHMARK ELEVATION: furnished by contract surveyors

LOGGED BY: P. E. Coates

DRILL / METHOD USED: BK-51HD, hollow-stem augers, automatic hammer

DIAMOND CORE SIZE: NQ

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORE RESU REC (%)
0.00	167.34	TOPSOIL	0.00					
0.15	167.19	Mixed tan and gray highly micaceous SILT, some veins of reddish-tan clayey silt (fill?)	0.76		166.58	2-1-2	0.46	
				1.22	166.12			
			1.52		165.82	2-2-2	0.37	
2.13	165.21	Mixed tan and gray highly micaceous SILT, some veins of reddish-tan clayey silt		1.98	165.36			
			2.29		165.05	3-4-5	0.46	
				2.74	164.60			
			3.05		164.29	3-3-4	0.46	
				3.51	163.83			
4.57	162.77	Mixed tan and brown micaceous Silty SAND	4.57		162.77	2-4-5	0.46	
				5.03	162.31			
			6.10		161.24	12-12-16	0.46	
				6.55	160.79			
8.23	159.11	Decomposed rock	7.62		159.72	22-31-41	0.46	
				8.08	159.26			
9.60	157.74	Bluish-gray and white highly weathered to moderately weathered micaceous Phaneritic GRANITE — 45 degree joints	9.14		158.20	6-3-50/0.09	0.40	
				9.54	157.80			
			9.60		157.74	core run #1	0.28	30
			9.91	9.91	157.43			
		55 to 80 degree joints				core run #2	1.46	96
		all joints weathered	11.43	11.43	155.91			
		50 to 85 degree joints				core run #3	2.25	74
14.48	152.86	20 to 45 degree joints	14.48	14.48	152.86			
						core run #4	1.39	91
		Bluish-gray and white moderately weathered Phaneritic GRANITE						
16.00	151.34			16.00	151.34			
		Bottom of boring @ 160 meters						

GROUNDWATER DEPTH: 3.88 Meters CAVE-IN DEPTH: 4.99 Meters GROUNDWATER ELEVATION: 163.45 @ 2-20-98

GROUNDWATER DEPTH: 4.20 Meters CAVE-IN DEPTH: 6.02 Meters GROUNDWATER ELEVATION: 163.14 @ 2-17-98

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B639

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING: CSX Railroad over Route 250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnished by contract surveyors

DRILL METHOD USED: BK-51HD, hollow-stem augers, automatic hammer

BORING NO: TB-67 PAGE 1

BORING LOCATION: Station 12+60, 4.8m rt., existing CSX RR track

BORING ELEVATION: 162.87 Meters

SUBSTRUCTURE UNIT: Pier

DATE DRILLED: 2-19-98

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ

SCALE	STATA (Meters)	DEPTHS	STRATA (Meters)	ELEV	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORE RESULTS REC (%)
0.00	0.00		162.87		ASPHALT CONCRETE	0.00					
	0.18		162.69		CEMENT TREATED CRUSHED AGGREGATE	0.76		162.11	10-10-15	0.21	
	0.61		162.26		Brown highly micaceous SILT	1.52	1.22	161.65	5-8-10	0.30	
0.75	1.52		161.35		Decomposed GRANITE	2.29	1.98	161.35	12-31-41	0.30	
	3.05		159.82		Light brown decomposed to highly weathered Phaneritic GRANITE with some schistose appearance, mica present where schistocity is apparent	3.05	2.74	160.89	50/.12	0.12	
1.50						4.11	3.17	160.58	50/.09	0.09	
2.25						5.64	4.21	160.13	50/.06	0.06	
						5.73	5.73	159.82	core run #1	0.00	0
	6.86		156.01		Gray and brownish-white very highly weathered Phaneritic GRANITE, micaceous	6.71	6.71	159.70	50/.03	0.03	
3.00						6.83	6.83	158.76	core run #2	0.30	33
					25 to 80 degree joints	6.86	6.86	158.66	core run #3	0.67	44
3.75						7.77	7.77	157.23	core run #4	1.37	90
	9.30		153.57		Gray and brownish-white highly weathered Phaneritic GRANITE	9.30	9.30	157.14	core run #5	1.37	90
4.50					20 to 80 defree joints	9.30	9.30	156.16			
	10.76		152.11		Gray slightly weathered to fresh Phaneritic GRANITE	10.82	10.82	156.04			
	12.34		150.53				12.34	156.01			
5.25					Bottom of boring @ 12.34 meters			155.10			
6.00								153.57			
6.75								152.05			
7.50								150.53			

GROUNDWATER DEPTH: n/a* Meters CAVE-IN DEPTH: n/a* Met GROUNDWATER ELEVATION: N/A @

GROUNDWATER DEPTH: n/a* Meters CAVE-IN DEPTH: n/a* Met GROUNDWATER ELEVATION: N/A @

REMARKS: *backfilled upon completion due to location within traffic lane

Culpeper District

Foundation Investigation Boring Log

ROUTE: Route 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B639

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING CSX Railroad over Route 250 Bypass

BENCHMARK LOCATION: furnished by contract surveyors

BENCHMARK ELEVATION: furnishe Meters

DRILL / METHOD USED: BK-51HD, hollow-stem augers, automatic hammer

BORING NO: TB-68 PAGE 1

BORING LOCATION: Station 12+93, 8.4m rt., existing CSX RR track

BORING ELEVATION: 166.00 Meters

SUBSTRUCTURE UNIT: Abutment B

DATE DRILLED: 2-11-98, 2-12-98

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NQ

STRATA (Meters)	DEPTHS	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORE REC (%)
0.00		166.00	Tan highly micaceous Clayey SILT, trace organics	0.00					
1.22		164.78		0.76	1.22	165.24 164.78	2-4-4	0.41	
2.29		163.71	Mixed tan & gray micaceous Sandy SILT, tr organics	1.52	1.98	164.48 164.02	3-4-5	0.46	
			Tan highly micaceous Sandy SILT	2.29	2.74	163.71 163.26	3-4-5	0.46	
				3.05	3.35	162.95 162.65	3-3-4	0.46	
4.57		161.43	Mixed tan & gray highly micaceous Sandy SILT	4.57	5.03	161.43 160.97	3-3-7	0.46	
5.49		160.51	Decomposed rock	5.76		160.24	50/.03	0.00	
5.79		160.21	25 to 40 degree joints	5.79	5.79	160.21			
			25 to 60 degree joints	6.55	6.55	159.45	core run #1	0.67	88
			Bluish-gray moderately weathered Phaneritic GRANITE	8.08	8.08	157.92	core run #2	1.51	99
			35 to 80 degree joints	11.13	11.13	154.87	core run #3	2.74	90
			50 to 60 degree joints				core run #4	2.25	99
13.41		152.59	Bluish-gray and brownish-gray moderately weathered to very highly weathered Phaneritic GRANITE 25 to 60 degree joints	13.41	13.41	152.59	core run #5	1.46	73
15.39		150.61	very highly weathered zone between 14.1 and 14.7m		15.39	150.61			
			Bottom of boring @ 15.39 meters						

GROUNDWATER DEPTH: 4.41 Meters CAVE-IN DEPTH: 14.54 Meters GROUNDWATER ELEVATION: 161.59 @ 2-13-98

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B629

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Woodburn Road over proposed Bypass

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME 45,hollow-stem augers, manual hammer

BORING NO: TB-78 PAGE 1

BORING LOCATION: Station 11+63, 5m lt., Woodburn Rd. Const. B/L

BORING ELEVATION: 177.89 Meters

SUBSTRUCTURE UNIT: Abutment A

DATE DRILLED: 11-3-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	177.89	TOPSOIL	0.00						
0.15	177.74					2-2-3	0.30		
		Reddish-tan micaceous Silty CLAY		0.46	177.43				
			0.76		177.13				
0.91	176.98					3-3-4	0.39		
		Reddish-tan micaceous SILT		1.22	176.67				
1.37	176.52								
			1.52		176.37				
		Tan highly micaceous SILT				4-4-6	0.27		
				1.98	175.91				
			2.29		175.60				
						6-6-8	0.21		
				2.74	175.15				
			3.05		174.84				
						5-6-8	0.30		
				3.50	174.39				
3.96	173.93								
		Tan micaceous SILT, some fine sand							
		(decomposed Mica SCHIST)	4.57		173.32				
						18-50/.09	0.24		
				4.82	173.07				
			6.10		171.79				
						37-30-50	0.21		
				6.55	171.34				
7.32	170.57								
		Weathered Mica SCHIST	7.62		170.27	50/.03	0.00		
7.65	170.24			7.65	170.24				
		Bottom of boring @ 7.65 meters							

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 6.86 Meters GROUNDWATER ELEVATION: N/A @ 11-5-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-79 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B629

BORING LOCATION: Station 12+24.5, 3m lt., Woodburn Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 176.69 Meters

STREAM / ROAD CROSSING Woodburn Road over proposed Bypass

SUBSTRUCTURE UNIT: Pier

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 11-3-97, 11-4-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME 45,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: NX

STATIONS (Meters)	DEPTHS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM	DEPTH TO	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	REC (M)	CORING RESULTS REC (%)	RQD (%)
0.00	176.69	SURFACE TREATMENT	0.00						
0.06	176.63	CRUSHED AGGREGATE		0.46	176.23	24-9-18	0.24		
0.21	176.48	Reddish-tan micaceous SILT, trace of clay	1.52	1.98	175.17 174.71	5-6-8	0.40		
2.74	173.95	Grayish-brown Silty SAND, some rock fragments	3.05	3.08	173.64 173.61	50/.03	0.03		
4.88	171.81	Grayish-brown highly micaceous SILT (decomposed schist)	4.57 5.33 6.10	4.63 5.79 6.49	172.12 172.06 171.36 170.90 170.59 170.20	50/.06 9-8-9 13-19-50/.09	0.06 0.34 0.43		
6.90	169.79	Yellowish-gray fine SAND, some silt	6.86	7.31	169.83 169.38	43-12-29	0.43		
7.62	169.07	Highly weathered Mica SCHIST	7.62	7.71	169.07 168.98	50/.09	0.09		
8.23	168.46	Gray Mica SCHIST — 50 to 70 degree fractures, weathered zone @ 8.93m	8.23 9.30	9.30	168.46 167.39	core run #1	1.04	97	35
		gneissic from 8.93 to 11.79 meters, 50 to 80 degree fractures	10.82	10.82	165.87	core run #2	1.46	96	94
		50 to 80 degree fractures, some healed				core run #3	1.52	100	96
12.34	164.35	Bottom of boring @ 12.34 meters		12.34	164.35				

GROUNDWATER DEPTH: 6.58 Meters CAVE-IN DEPTH: 6.98 Meters GROUNDWATER ELEVATION: 170.11 @ 11-3-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS: backfilled due to location within roadway

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-80 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B629

BORING LOCATION: Station 12+80, 3m lt., Woodburn Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 177.69 Meters

STREAM / ROAD CROSSING Woodburn Road over proposed Bypass

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 10-30-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: BK-51,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	177.69	TOPSOIL	0.00			2-1-2	0.27		
0.15	177.54			0.46	177.23				
		Reddish-brown Silty CLAY, some sand, trace of mica	0.76		176.93	4-5-9	0.34		
				1.22	176.47				
1.22	176.47								
		Reddish-tan micaceous Silty SAND	1.52		176.17	10-12-14	0.37		
1.83	175.86			1.98	175.71				
		Tan highly micaceous SILT with veins of red silt, trace of fine sand	2.29		175.40	7-8-24	0.34		
2.65	175.04			2.74	174.95				
		Tan to gray highly micaceous SILT, some weathered rock fragments	3.05		174.64	42-50/.06	0.30		
				3.26	174.43				
		(decomposed schist)							
4.40	173.29								
			4.57		173.12	50/.03	0.03		
		Gray decomposed SCHIST grinding between 4.57 and 5.79 meters		4.60	173.09				
5.79	171.90		5.79		171.90	core run #1	0.67	73	37
		Granite GNEISS 50 to 70 degree fracture angles	6.71	6.71	170.98				
						core run #2	1.52	100	84
8.23	169.46			8.23	169.46				
		Bottom of boring @ 8.23 meters							

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 5.30 Meters GROUNDWATER ELEVATION: N/A @ 10-31-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS: backfilled after 24 hours

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-81 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B629

BORING LOCATION: Station 11+74, 5m rt., Woodburn Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 177.32 Meters

STREAM / ROAD CROSSING Woodburn Road over proposed Bypass

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 11-4-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME 45,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	177.32	TOPSOIL (dark brown silt, some sand - fill?)	0.00			W.O.H.	0.39		
0.15	177.17			0.46	176.86				
		Tan to grayish-brown highly micaceous SILT, trace of sand	0.76		176.56	3-3-4	0.30		
				1.22	176.10				
			1.52		175.80	5-5-7	0.48		
				1.98	175.34				
			2.29		175.03	5-6-6	0.37		
2.81	174.51			2.74	174.58				
		Tan to grayish-brown highly micaceous SILT, some fine sand	3.05		174.27	6-7-8	0.40		
				3.50	173.82				
			4.57		172.75	8-9-10	0.30		
				5.02	172.30				
			6.10		171.22	5-6-8	0.39		
				6.55	170.77				
7.32	170.00								
			7.62		169.70	16-16-28	0.36		
				8.07	169.25				
		Gray-brown micaceous SILT, some fine sand							
			9.14		168.18	10-13-17	0.40		
				9.60	167.72				
10.51	166.81		10.60		166.72	23-50/.15	0.30		
				10.97	166.35				
		Brown highly micaceous SAND, some silt (decomposed Mica SCHIST)	11.89		165.43	50/.03	0.03		
11.92	165.40			11.92	165.40				
		UNABLE TO PENETRATE @ 11.92 METERS							

GROUNDWATER DEPTH: 7.40 Meters CAVE-IN DEPTH: 11.12 Meters GROUNDWATER ELEVATION: 169.92 @ 11-6-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, B629

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING Woodburn Road over proposed Bypass

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: BK-51,hollow-stem augers, manual hammer

BORING NO: TB-82 PAGE 1

BORING LOCATION: Station 12+37, 7m rt., Woodburn Rd. Const. B/L

BORING ELEVATION: 177.47 Meters

SUBSTRUCTURE UNIT: Pier

DATE DRILLED: 10-31-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: NX

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	177.47	TOPSOIL	0.00			1-2-1	0.15		
0.15	177.32			0.46	177.01				
		Reddish-tan micaceous Clayey SILT							
			1.52		175.95	7-8-9	0.40		
				1.98	175.49				
2.29	175.18	Tan micaceous SILT							
2.90	174.57		3.05		174.42	50/.03	0.00		
		Mixed brown and gray micaceous Silty SAND		3.08	174.39				
		(decomposed schist)							
			4.57		172.90	50/.15	0.15		
				4.72	172.75				
5.33	172.14		5.33		172.14	50/.03	0.03		
				5.36	172.11				
		Mixed brown and tan micaceous Silty SAND, trace of mica	6.10		171.37	50/.03	0.03		
				6.13	171.34				
			6.86		170.61	50/.12	0.09		
				6.98	170.49				
			7.62		169.85	50/.06	0.06		
				7.68	169.79				
		(decomposed to highly weathered schist)							
9.14	168.33		9.14	9.14	168.33	50/0	0.00		
		Light gray to tan very highly weathered to slightly weathered Pegmatite Granite GNEISS				core run #1	0.91	100	29
		highly weathered	10.06	10.06	167.41				
10.36	167.11					core run #2	1.10	95	0
		Brown Calc-Silicate ROCK (?) slightly weathered 50 to 70 degree fractures							
11.22	166.25			11.22	166.25				
		Bottom of boring @ 11.22 meters							

GROUNDWATER DEPTH: 5.88 Meters CAVE-IN DEPTH: 6.31 Meters GROUNDWATER ELEVATION: 171.59 @ 11-3-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS: boring terminated due to blocked core barrel

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-83 PAGE 1

PROJECT NO: 6029-002-F22, PE101, B629

BORING LOCATION: Station 12+92, 12m rt., Woodburn Rd. Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 178.39 Meters

STREAM / ROAD CROSSING Woodburn Road over proposed Bypass

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: n/a, elevations supplied by contract surveyors

DATE DRILLED: 10-29-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME 45,hollow-stem augers, manual hammer

DIAMOND CORE SIZE: NX

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	178.39	TOPSOIL	0.00			3-4-4	0.24		
0.15	178.24			0.46	177.93				
		Dark reddish-brown Clayey SILT, some sand	0.76		177.63	10-26-50/.09	0.37		
1.07	177.32			1.16	177.23				
		Reddish-tan micaceous Silty SAND, some weathered rock fragments	1.52		176.87	23-26-30	0.43		
				1.98	176.41				
			2.29		176.10	18-50/.09	0.18		
				2.53	175.86				
			3.05		175.34	14-11-11	0.30		
				3.51	174.88				
3.96	174.43								
		Decomposed to highly weathered Mica SCHIST							
4.11	174.28		4.30		174.09	core run #1	0.18	100	0
		Dark gray highly weathered to moderately weathered Granite GNEISS 30 degree joints	4.30	4.30	174.09				
						core run #2	0.73	92	19
		30 to 90 degree joints	5.09	5.09	173.30				
						core run #3	0.61	80	60
5.85	172.54			5.85	172.54				
		Bottom of boring @ 5.85 meters							

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 3.47 Meters GROUNDWATER ELEVATION: N/A @ 10-31-97

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: Meters GROUNDWATER ELEVATION: N/A @

REMARKS:

V.D.O.T.
Culpeper District

Foundation Investigation Boring Log

ROUTE: 29 | BORING NO: TB-93

PROJECT NO: 6029-002-F22, PE101, C501, B631 | BORING LOCATION: Station 12+04.5 Rosiyn Ridge Rd. 7.2 meters left of Const. B/L

COUNTY / CITY: Albemarle | BORING ELEVATION: 180.08 Meters

STREAM / ROAD CROSSING: Rosiyn Ridge Road over Route 29 Bypass | SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: Control Monument No. 02-0348 in concrete island at intersection of Route 743 and 631 | DATE DRILLED: 4-17-97

BENCHMARK ELEVATION: 174.67 Meters | LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B | DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%
0.00	180.08	TOPSOIL							
0.04	180.04	Brown SILT, some fine to medium gravel and sand							
0.70	179.38	Reddish-brown Sandy SILT, some fine to medium gravel							
1.52	178.56		1.52		178.56	39-48-50/.12	0.42		
		Mixed reddish-brown, brown and tan Sandy SILT, trace of weathered rock fragments		1.94	178.14				
			3.05	3.33	177.03 176.75	18-50/.13	0.28		
4.57	175.51		4.57		175.51	8-15-16	0.46		
		Mixed reddish-brown, dark brown, tan, purple, and white Sandy SILT, some clay, some weathered rock fragments		5.03	175.05				
6.10	173.98		6.10		173.98	50/.12	0.12		
		Mixed brown and grayish-brown highly weathered SCHIST		6.22	173.86				
			7.62		172.46	31-49-50/.07	0.37		
7.99	172.09	Mixed reddish-brown, brown, & tan highly weathered SCHIST		7.99	172.09				
8.44	171.64		8.44	8.44	171.64	50/0.0	0.00		
		Unable to Penetrate @ 8.44 meters							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 6.40 meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.
Culpeper District

Foundation Investigation Boring Log

ROUTE: 29

BORING NO: TB-94

PROJECT NO: 6029-002-F22, PE101, C501, B631

BORING LOCATION: Station 12+35.4 Rosiyn Ridge Rd. 7.0 meters left of Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 179.65 Meters

STREAM / ROAD CROSSING: Rosiyn Ridge Road over Route 29 Bypass

SUBSTRUCTURE UNIT: Pier

BENCHMARK LOCATION: Control Monument No. 02-0348 in concrete island at intersection of Route 743 and 631

DATE DRILLED: 4-15-97

BENCHMARK ELEVATION: 174.67 Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: NX

STRATA DEPTHS (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%
0.00	179.65	TOPSOIL							
0.04	179.61								
		Mixed reddish-brown and tan Clayey SILT, trace of sand, mica, and weathered rock fragments	1.52	1.98	178.13 177.67	3-4-8	0.40		
3.35	176.30	Red-brown and tan micaceous SILT, tr sand and rock frags	3.05	3.51	176.60 176.14	8-15-30	0.46		
3.51	176.14								
		Mixed tan and gray micaceous Sandy SILT, some rock frags	4.57	5.03	175.08 174.62	10-15-25	0.46		
			6.10	6.55	173.55 173.10	22-37-41	0.44		
		decomposed SCHIST	7.62	8.08	172.03 171.57	20-25-31	0.46		
		extremely dense between 9.14 and 10.67 meters	9.14	9.60	170.51 170.05	17-28-26	0.46		
10.76	168.89		10.73 10.76	10.76	168.92 168.89	50/.03	0.03		
		Tan to white highly weathered to slightly weathered SCHIST	12.28	12.28	167.37	Core Run #1	1.42	93	4
		void from 12.47 to 13.17 meters				Core Run #2	0.55	45	2
		Bottom of boring @ 13.81 meters	13.50	13.50	166.15	Core Run #3	0.31	100	7
13.81	165.84			13.81	165.84				

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 7.01 meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: roots to 0.30 meters

V.D.O.T.
Culpeper District

Foundation Investigation Boring Log

ROUTE: 29

BORING NO: TB-95

PROJECT NO: 6029-002-F22, PE101, C501,B631

BORING LOCATION: Station 12+65.8 Roslyn Ridge Rd. 6.2 meters left of Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 178.63 Meters

STREAM / ROAD CROSSING: Roslyn Ridge Road over Route 29 Bypass

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: Control Monument No. 02-0348 in concrete island at intersection of Route 743 and 631

DATE DRILLED: 3-27-97

BENCHMARK ELEVATION: 174.67 Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	178.63	TOPSOIL, some roots							
0.04	178.59	Reddish-tan Clayey SILT, some fine to med. sand, tr mica							
0.91	177.72	Reddish-tan SILT, some quartz fragments, tr mica and clay	1.52	1.98	177.11 176.65	2-5-7	0.40		
2.29	176.34	Gray SILT w/tan veins, some fine to medium quartz fragments and mica	3.05	3.51	175.58 175.12	3-4-6	0.42		
			4.57	5.03	174.06 173.60	4-7-12	0.38		
			6.10	6.55	172.53 172.08	6-7-12	0.44		
7.62	171.01	Gray SILT w/tan veins, some fine to coarse quartz fragments and mica	7.62	8.08	171.01 170.55	7-9-12	0.40		
			9.14	9.60	169.49 169.03	7-8-11	0.36		
		tight material @ 11.5m	10.67	11.13	167.96 167.50	9-12-14	0.35		
		very moist from 12.19 to 12.65m	12.19	12.65	166.44 165.98	19-26-26	0.40		
		very tight from 13.71 to 14.51m	13.71	13.80	164.92 164.83	50/0.09	0.00		
		less dense between 14.51 and 14.93m	15.24	15.27	163.39 163.36	50/0.03	0.00		
		very tight drilling from 14.93 to 15.48m							
15.48	163.15	Unable to Penetrate @ 15.48 meters							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: N/A GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: roots to 0.30 meters

V.D.O.T.
Culpeper District

Foundation Investigation Boring Log

ROUTE: 29

BORING NO: TB-96

PROJECT NO: 6029-002-F22, PE101, C501, B631

BORING LOCATION: Station 12+04.2 Rosiyn Ridge Rd. 8.05 meters right of Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 181.48 Meters

STREAM / ROAD CROSSING: Rosiyn Ridge Road over Route 29 Bypass

SUBSTRUCTURE UNIT: Abutment A

BENCHMARK LOCATION: Control Monument No. 02-0348 in concrete island at intersection of Route 743 and 631

DATE DRILLED: 4-16-97

BENCHMARK ELEVATION: 174.67 Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	181.48	TOPSOIL							
0.30	181.18	Reddish-brown Clayey SILT, trace of sand and mica							
1.22	180.26	Mixed reddish-brown, tan and gray micaceous Sandy SILT, some weathered quartz fragments	1.52	1.98	179.96 179.50	11-40-43	0.46		
			3.05	3.51	178.43 177.97	5-19-33	0.46		
4.57	176.91	Mixed reddish-brown, tan and gray micaceous Sandy SILT, some weathered quartz fragments and sand high quartz content from 7.62 to 9.40 meters	4.57	4.98	176.91 176.50	18-34-50/.11	0.42		
			6.10	6.55	175.38 174.93	32-25-33	0.46		
			7.62	8.08	173.86 173.40	27-28-28	0.44		
			9.14	9.60	172.34 171.88	16-35-41	0.44		
9.60	171.88	Bottom of boring @ 9.60 meters							

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 5.49 meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.
Culpeper District

Foundation Investigation Boring Log

ROUTE: 29

BORING NO: TB-97

PROJECT NO: 6029-002-F22, PE101, C501, B631

BORING LOCATION: Station 12+38.6 Roslyn Ridge Rd. 3.6 meters right of Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 179.74 Meters

STREAM / ROAD CROSSING: Roslyn Ridge Road over Route 29 Bypass

SUBSTRUCTURE UNIT: Pier

BENCHMARK LOCATION: Control Monument No. 02-0348 in concrete island at intersection of Route 743 and 631

DATE DRILLED: 4-22-07

BENCHMARK ELEVATION: 174.67 Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	179.74	TOPSOIL							
0.04		Reddish-brown Silty CLAY, trace of sand and mica							
0.46	179.28	Mixed reddish-brown to tan micaceous SILT, some sand and weathered rock fragments	1.52	1.98	178.22 177.76	4-5-7	0.46		
3.05	176.69	Mixed tan, light tan, and reddish-brown SILT, trace of weathered rock fragments and sand	3.05	3.51	176.69 176.23	3-4-5	0.44		
4.57	175.17	Mixed tan, light tan, and gray micaceous SILT, some weathered rock fragments, trace of sand	4.57	4.80	175.17 174.94	38-50/.08	0.23		
			6.10	6.55	173.64 173.19	9-10-10	0.45		
			7.62	7.68	172.12 172.06	50/.06	0.06		
			9.14	9.60	170.60 170.14	21-21-16	0.41		
10.69	169.05	Unable to Penetrate @ 10.69 meters	10.67	10.69	169.07 169.05	50/.015	0.00		

GROUNDWATER DEPTH: Meters CAVE-IN DEPTH: 8.44 meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: extremely dense (hard) between 9.76 and 10.67 meters

V.D.O.T.
Culpeper District

Foundation Investigation Boring Log

ROUTE: 29

BORING NO: TB-98

PROJECT NO: 6029-002-F22, PE101, C501, B631

BORING LOCATION: Station 12+73 Roslyn Ridge Rd. 10.3 meters right of Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 180.38 Meters

STREAM / ROAD CROSSING: Roslyn Ridge Road over Route 29 Bypass

SUBSTRUCTURE UNIT: Abutment B

BENCHMARK LOCATION: Control Monument No. 02-0348 in concrete island at intersection of Route 743 and 631

DATE DRILLED: 4-18-07

BENCHMARK ELEVATION: 174.67 Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: n/a

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	180.38	TOPSOIL							
0.04		Reddish-brown Silty CLAY, trace of sand and mica							
1.52	178.86	Mixed reddish-brown to tan micaceous SILT, trace of sand and weathered rock fragments	1.52	1.98	178.86 178.40	3-4-5	0.46		
3.05	177.33	Mixed tan, light tan, and reddish-brown SILT, some weathered rock fragments, trace of sand	3.05	3.51	177.33 176.87	3-3-4	0.46		
4.57	175.81	Mixed tan, light tan, and gray micaceous SILT, some weathered rock fragments, trace of sand	4.57	5.03	175.81 175.35	10-11-9	0.46		
			6.10	6.55	174.28 173.83	4-6-7	0.46		
			7.62	8.08	172.76 172.30	3-5-14	0.44		
		weathered rock @ 9.14m	9.14	9.22	171.24 171.16	50/.08	0.08		
9.50	170.88	Mixed gray to light gray and tan micaceous SILT, some weathered rock fragments and fine to medium sand	10.67	11.13	169.71 169.25	13-15-13	0.46		
12.19	168.19	Mixed tan to light tan and gray micaceous SILT, some weathered rock fragments and sand	12.19	12.45	168.19 167.93	36-50/.11	0.26		
13.71	166.67	Mixed tan to light tan and gray micaceous Sandy SILT, some weathered rock fragments	13.71	14.17	166.67 166.21	14-19-23	0.46		
15.24	165.14	Mixed brown and tan micaceous SILT, some weathered rock fragments and sand	15.24	15.51	165.14 164.87	12-50/.12	0.27		
17.92	162.46	Unable to Penetrate @ 17.92 meters	16.76	17.92	163.62 162.46	50/.14	0.13		

GROUNDWATER DEPTH: 12.01 Meters CAVE-IN DEPTH: 12.92 meters GROUNDWATER ELEVATION: 168.37 @ 24 Hours

REMARKS: increase in moisture and decrease in drilling resistance from 9.50 to 13.71 meters, material wet @ 13.71 meters

no apparent auger resistance between 17.37 to 17.92 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM01 PAGE 1

BORING LOCATION: Station 152+23, 26m rt Route 29 Bypass North Grounds Connector Const. C/L

BORING ELEVATION: 165.70 Meters

SUBSTRUCTURE UNIT: SWM Pond #3-1

DATE DRILLED: 8-25-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
		BOTTOM OF POND @ 170.5 METERS							
0.00	165.70	TOPSOIL							
0.30	165.40	Brown SILT, trace of sand and mica (ML)							
0.91	164.79	Brown Silty SAND (SM)	1.22	1.68	164.48 / 164.02	0-0-0	0.46		
2.43	163.27	Gray Silty SAND, some fine weathered rock fragments and mica (SM)	2.74	3.20	162.96 / 162.50	2-2-4	0.46		
3.17	162.53	Mixed brown and gray decomposed Mica SCHIST	4.27		161.43	4-21-50/.122	0.33		
4.60	161.10	Bottom of boring @ 4.60 meters		4.60	161.10				

GROUNDWATER DEPTH: 1.19 Meters CAVED @ 1.83 Meters GROUNDWATER ELEVATION: 164.51 @ **Completion**

GROUNDWATER DEPTH: n/a Meters CAVED @ n/a Meters GROUNDWATER ELEVATION: N/A @ **24 hours**

REMARKS: _____ soil was wet @ 0.91 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM03 PAGE 1

BORING LOCATION: Station 17+70.5, 29.5m rt Ramp E Const B/L

BORING ELEVATION: 171.50 Meters

SUBSTRUCTURE UNIT: SWM Pond #5-1

DATE DRILLED: 8-15-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
		BOTTOM OF POND @ 178.5 METERS							
0.00	171.50	TOPSOIL							
0.24	171.26	Brown Sandy SILT, trace of mica (ML)							
0.76	170.74	Brown Sandy SILT, some rock fragments, trace of mica (ML)	1.52	1.54	169.98 169.96	50/.015	0.015		
1.54	169.96	Unable to Penetrate (Auger Refusal) @ 1.54 meters							

GROUNDWATER DEPTH: 0.95 Meters CAVE-IN DEPTH: 1.00 Meter GROUNDWATER ELEVATION: 170.55 @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 0.90 Meter GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM04 PAGE 1

BORING LOCATION: Station 17+82, 28m rt Ramp E Const B/L

BORING ELEVATION: 171.70 Meters

SUBSTRUCTURE UNIT: SWM Pond #5-1

DATE DRILLED: 8-13-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
		BOTTOM OF POND @ 170.5 METERS						
0.00	171.70	TOPSOIL						
0.18	171.52	Tan Silty SAND, trace of mica (SM) A-2-4(0)	0.18		171.52	Classification, lab report No. 57-64957		
0.91	170.79	Mixed gray and tan Silty SAND, some fine to medium rock fragments, trace of mica (SM) A-2-4(0)	0.91	0.91	170.79	Classification, lab report No. 57-64960		
4.00	166.82	Bottom of boring @ 4.00 meters		4.00	166.82			

GROUNDWATER DEPTH: 1.90 Meters CAVE-IN DEPTH: 2.8 Meters GROUNDWATER ELEVATION: 169.80 @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 1.0 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM05 PAGE 1

BORING LOCATION: Station 10+70, 51m rt Ramp F Const B/L

BORING ELEVATION: 165.20 Meters

SUBSTRUCTURE UNIT: SWM Pond #5-2

DATE DRILLED: 8-13-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
		BOTTOM OF POND @ 166.5 METERS						
0.00	165.20	TOPSOIL						
0.12	165.08	Brown Silty SAND, trace of fine to medium subrounded gravel, trace of mica (SM) A-2-4 *SANDY LOAM*	0.18		165.02	Classification lab report No. 9-181-97		
1.98	163.22	Unable to Penetrate (Auger Refusal) @ 1.98 meters		1.98	163.22			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 1.60 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 1.60 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS: _____ rock encountered @ 1.89 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM06 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 11+14, 46.5m rt Ramp F Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 168.50 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #6-1

BENCHMARK LOCATION: provided by contract surveyor

DATE DRILLED: 8-19-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	168.50	TOPSOIL							
0.3	168.20								
		Reddish-brown SILT, some mica, trace of sand (ML)	1.07		167.43	14-29-35	0.46		
1.52	166.98			1.52	166.98				
		Mixed tan, gray and dark brown decomposed mica SCHIST							
		BOTTOM OF POND @ 166.5 METERS							
			2.59		165.91	37-45-50/.122	0.34		
2.77	165.73			2.77	165.73				
		Mixed gray and tan weathered mica SCHIST							
			4.11		164.39	32-28-50/.06	0.37		
				4.48	164.02				
			5.64	5.64	162.86	50/0.00	0.00		
6.88	161.62			6.88	161.62				
		Unable to Penetrate (Auger Refusal) @ 6.88 meters							

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.20 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 4.20 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: ___ material was varicolored between 2.77 and 4.48 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM07 PAGE 1

BORING LOCATION: Station 164+17, 127m rt Route 29 Bypass Const B/L

BORING ELEVATION: 169.10 Meters

SUBSTRUCTURE UNIT: SWM Pond #7-1

DATE DRILLED: 8-11-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA (Meters)	DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
			BOTTOM OF POND @ 170.5 METERS							
0.00	169.10		TOPSOIL							
0.21	168.89		Reddish-brown Silty SAND, trace of mica (SM)	1.52		167.58				
1.68	167.42		Brown Sandy lean CLAY, trace of mica (CL) A-6(5)				4-6-8	0.46		
1.89	167.21		Gray to light gray Sandy SILT, some clay, trace of mica (ML)		1.98	167.12				
3.05	166.05		Greenish-brown to gray highly micaceous SILT, trace of very fine sand (ML)	3.05		166.05	4-6-8	0.00		
			decomposed schist between 4.05 and 5.18 meters	4.57	3.51	165.59 / 164.53	16-39-50/.122	0.122		
5.18	163.92		Brown highly micaceous SILT, trace of very fine sand (ML)	6.1	4.91	164.19 / 163.00	26-28-29	0.46		
6.55	162.55		Bottom of boring @ 6.55 meters		6.55	162.55				

GROUNDWATER DEPTH: 2.60 Meters CAVE-IN DEPTH 3.45 meters GROUNDWATER ELEVATION: 166.50 @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: sample from 6.10 to 6.55m was wet

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM08 PAGE 1

BORING LOCATION: Station 164+21, 98m rt Route 29 Bypass Const B/L

BORING ELEVATION: 170.00 Meters

SUBSTRUCTURE UNIT: SWM Pond #7-1

DATE DRILLED: 8-12-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA (Meters)	DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
			BOTTOM OF POND @ 170.5 METERS						
0.00		170.00	TOPSOIL						
0.24		169.76	Reddish-brown Silty SAND, trace of mica (SM) A-4 *SANDY LOAM*	0.24		169.76	Classification lab report No. 9-178-97		
1.98		168.02	Brown Sandy lean CLAY, trace of mica (CL) A-6(5)	1.98	1.98	168.02	Classification lab report No. 57-64879		
2.59		167.41	Tan Silty SAND, trace of mica (decomposed SCHIST) (SM) A-4(0)	2.59	2.59	167.41	Classification lab report No. 57-64878		
3.20		166.80	Unable to Penetrate (Auger Refusal) @ 3.20 meters		3.20	166.80			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH 1.8 meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM09 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 183+47, 60m lt Route 29 Bypass SBL Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 156.60 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #11-1

BENCHMARK LOCATION: provided by contract surveyors

DATE DRILLED: 7-28-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
		BOTTOM OF POND @ 157.0 METERS							
0.00	156.60	TOPSOIL							
0.18	156.42	Reddish-brown Silty CLAY, trace of sand and mica (ML-CL)							
1.22	155.38	Mixed gray, brown, and tan micaceous SILT, trace of fine sand (ML)	1.52		155.08	3-4-4	0.46		
				1.98	154.62				
			3.05		153.55	3-4-5	0.46		
3.51	153.09	Mixed gray, brown, and tan SILT, trace of fine sand and mica (ML)		3.51	153.09				
			4.57		152.03	5-5-7	0.46		
5.03	151.57	Mixed gray, brown, and tan Sandy micaceous SILT (ML)		5.03	151.57				
			6.10		150.50	9-12-14	0.46		
6.55	150.05	Bottom of boring @ 6.55 meters		6.55	150.05				

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.30 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM10 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 183+00, 90m lt Route 29 Bypass SBL Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 159.70 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #11-1

BENCHMARK LOCATION: provided by contract surveyors

DATE DRILLED: 7-28-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEVATION (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	159.70	TOPSOIL						
0.18	159.52	Reddish-brown Silty CLAY, trace of sand and mica *CLAY* (MH/CH) A-7-6	0.18		159.52	Classification lab report No. 9-179-97		
1.22	158.48	Reddish-brown to brown Sandy SILT, some fine to medium rock fragments, trace of mica (ML) A-4(0)	1.22	1.22	158.48	Classification lab report No. 57-64745		
2.13	157.57	**BOTTOM OF POND @ 157.0 METERS**	2.13	2.13	157.57			
		Brown Sandy SILT, some fine to medium rock fragments, trace of mica (SM) A-4 (decomposed SCHIST) *SANDY LOAM*				Classification lab report No. 9-180-97		
6.40	153.30	Bottom of boring @ 6.40 meters		6.40	153.30			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.24 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM11 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 192+58.5, 76m rt Route 29 Bypass Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 146.87 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #13-1

BENCHMARK LOCATION: provided by contract surveyor

DATE DRILLED: 7-28-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	146.87	TOPSOIL						
0.30	146.57	Gray to brown highly micaceous Silty SAND, some some weathered rock fragments						
		(SM) A-2-4(0)	1.52		145.35	Classification lab report No. 57-64735		
				3.05	143.82			
		A-2-4(0)	6.10		140.77	Classification lab report No. 57-64880		
7.62	139.25			7.62	139.25			
		Unable to Penetrate (Auger Refusal) @ 7.62 meters						
		BOTTOM OF POND @ 132.5 METERS						

GROUNDWATER DEPTH: N/A Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: N/A Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: rock and boulder outcrops, weathered rock @ 1.22 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM11a PAGE 1

BORING LOCATION: Station 192+41, 81m rt Route 29 Bypass Const B/L

BORING ELEVATION: 147.40 Meters

SUBSTRUCTURE UNIT: SWM Pond #13-1

DATE DRILLED: 8-6-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEVATION (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	147.40	TOPSOIL							
0.15	147.25	Gray to brown micaceous Silty SAND, some fine to medium weathered rock fragments (SM)							
		(decomposed SCHIST)	1.52	1.57	145.88 145.83	50/.046	0.00		
			3.05	3.08	144.35 144.32	50/.031	0.00		
4.11	143.29	Unable to Penetrate (Auger Refusal) @ 4.11 meters							
		BOTTOM OF POND @ 132.5 METERS							

GROUNDWATER DEPTH: N/A Meters CAVE-IN DEPTH 2.31 meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: N/A Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM12 PAGE 1

BORING LOCATION: Station 192+64, 126m rt Route 29 Bypass Const B/L

BORING ELEVATION: 137.80 Meters

SUBSTRUCTURE UNIT: SWM Pond #13-1

DATE DRILLED: 7-25-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

DEPTH STRATA (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	137.80	TOPSOIL							
0.30	137.50	Brown Silty SAND, trace of mica (SM)							
1.22	136.58	Brown Sandy micaceous SILT (ML)							
1.52	136.28	Mixed brown, tan, and gray highly weathered Mica SCHIST (decomposed SCHIST)	1.52	1.63	136.28 136.17	50/.107	1.07		
3.05	134.75	Unable to Penetrate (Auger Refusal) @ 3.05 meters	3.05	3.05	134.75	50/.0	0.00		
		BOTTOM OF POND @ 132.5 METERS							

GROUNDWATER DEPTH: 1.28 Meters CAVE-IN DEPTH 2.04 meters GROUNDWATER ELEVATION: 136.52 @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: ___ very tight below 1.52 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM12a PAGE 1

BORING LOCATION: Station 192+40, 80m rt Route 29 Bypass Const B/L

BORING ELEVATION: 147.7 Meters

SUBSTRUCTURE UNIT: SWM Pond #13-1

DATE DRILLED: 7-31-97

LOGGED BY: H. N. Jenkins

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	147.70	TOPSOIL						
0.30	147.40	Mixed gray and brown micaceous Silty SAND, some fine to medium weathered rock fragments (SM) A-2-4(0)	0.30		147.40	Classification lab report No. 57-64877		
4.57	143.13	Unable to Penetrate (Auger Refusal) @ 4.57 meters		4.57	143.13			
		BOTTOM OF POND @ 132.5 METERS						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH 2.13 meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: N/A Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: rock and boulder outcrops, weathered rock @ 1.22 meters

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM15 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 217+17, 64m rt Route 29 Bypass NBL Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 158.90 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #21-1

BENCHMARK LOCATION: provided by contract surveyors

DATE DRILLED: 8-26-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: H. N. Jenkins

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEVATION (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM TO (Meters)	ELEVATION (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	158.90	TOPSOIL						
0.30	158.60	Tan Silty SAND, some fine to medium rock fragments, trace of mica (SM)						
1.10	157.80	Unable to Penetrate (Auger Refusal) @ 1.10 meters						
		BOTTOM OF POND @ 152.0 METERS						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 0.70 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 0.70 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM16 PAGE 1

BORING LOCATION: Station 217+54, 47m rt Route 29 Bypass NBL Const B/L

BORING ELEVATION: 155.7 Meters

SUBSTRUCTURE UNIT: SWM Pond #21-1

DATE DRILLED: 8-26-97

LOGGED BY: J. R. Finks

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM TO (Meters)	ELEVATION (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	155.70						
		TOPSOIL					
0.30	155.40						
		Brown Silty SAND, some fine to medium rock fragments (SM) A-4(0)			Classification lab report No. 57-64895		
1.10	154.60						
		Brown highly weathered SCHIST					
1.16	154.54						
		Unable to Penetrate (Auger Refusal) @ 1.16 meters					
		BOTTOM OF POND @ 152.0 METERS					

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 0.79 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 0.64 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: rock @ 1.10m

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM17 PAGE 1

BORING LOCATION: Station 220+09.5, 27m rt Route 29 Bypass NBL Const B/L

BORING ELEVATION: 155.9 Meters

SUBSTRUCTURE UNIT: SWM Pond #21-2

DATE DRILLED: 9-2-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: N/A

STATA DEPTHS (Meters)	STATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	155.90	TOPSOIL						
0.18	155.72	Tan Silty SAND, some weathered rock fragments (SM)	0.30		155.60			
0.95	154.95	Unable to Penetrate (Auger Refusal) @ 0.95 meters		0.95	154.95			
		BOTTOM OF POND @ 151.0 METERS						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH n/a meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM18 PAGE 1

PROJECT NO 6029-002-F22, PE101, C501

BORING LOCATION: Station 220+36, 47m rt Route 29 Bypass NBL Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 159.20 Meters

STREAM / ROAD CROSSIN N/A

SUBSTRUCTURE UNIT: SWM Pond #21-2

BENCHMARK LOCATION: provided by contract surveyors

DATE DRILLED: 9-2-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

SCALE	STRATA DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: RQD. (%)
0.00	0.00	159.20	TOPSOIL							
	0.18	159.02		0.18		159.02				
0.75			Reddish-tan Sandy SILT, some mica (ML) A-4(1)				Classification lab report No. 57-64940			
1.50				1.52		157.68	11-19-20	0.30		
					1.98	157.22				
2.25	2.29	156.91		2.29	2.29	156.91				
3.00			Brown Sandy lean CLAY, some sand, trace of mica (CL) A-6(3)	3.05		156.15	Classification lab report No. 57-64941 12-50/.09	0.10		
	3.20	156.00			*3.29*	155.91				
3.75	3.44	155.76	Gray highly weathered SCHIST Unable to Penetrate (Auger Refusal) @ 3.44 meters							
4.50										
5.25										
6.00										
6.75										
7.50			**BOTTOM OF POND @ 151.0 METERS**							

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.52 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.52 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS

|::

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM19 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 224+60, 97m lt Route 29 Bypass SBL Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 138.8 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #22

BENCHMARK LOCATION: provided by contract surveyor

DATE DRILLED: 9-5-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEVATION (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	138.80	TOPSOIL						
0.18	138.62	Tan Silty SAND, some quartz fragments and mica	0.30		138.50			
		(SM) A-2-4(0)				Classification lab report No. 57-64956		
1.49	137.31	Unable to Penetrate (Auger Refusal) @ 1.49 meters		1.49	137.31			
		BOTTOM OF POND @ 134.0 METERS						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 0.40 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM20 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 224+87, 125m lt Route 29 Bypass SBL Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 134.5 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #22

BENCHMARK LOCATION: provided by contract surveyor

DATE DRILLED: 9-5-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STATA (Meters)	DEPTHS	STRATA ELEVATIONS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00		134.50	TOPSOIL					
0.18		134.32	Tan Silty SAND, some quartz fragments and mica					
			BOTTOM OF POND @ 134.0 METERS					
			(SM)					
1.46		133.04						
			Unable to Penetrate (Auger Refusal) @ 1.46 meters					

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: n/a Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 0.21 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM21 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 234+20, 27m lt Route 29 Bypass Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 165.90 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #25-1

BENCHMARK LOCATION: provided by contract surveyors

DATE DRILLED: 9-3-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEVA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS RQD (%)
0.00	165.90	TOPSOIL							
0.18	165.72	Tan SILT with red veins, trace of clay (ML)							
		BOTTOM OF POND @ 165.0 METERS							
			1.52		164.38	4-8-8	0.28		
				1.98	163.92				
2.37	163.53	Tan SILT, some mica, trace of quartz gravel fragments (ML)	3.05		162.85	4-4-5	0.31		
				3.50	162.40				
			4.57		161.33	5-11-9	0.28		
5.03	160.87	Bottom of boring @ 5.03 meters		5.03	160.87				

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.29 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.29 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM22 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 234+52, 32m lt Route 29 Bypass Const B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 166.8 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #2S-1

BENCHMARK LOCATION: provided by contract surveyor

DATE DRILLED: 9-3-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: P. E. Coates

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STRATA DEPTHS (Meters)	STRATA ELEVATA (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	166.80	Brown SILT, some crushed aggregate (fill)						
1.28	165.52	Reddish-tan Sandy SILT, trace of quartz fragments and clay (ML)	1.28		165.52			
		BOTTOM OF POND @ 165.8 METERS						
2.37	164.43	Tan-brown Sandy SILT, some quartz fragments and mica (ML) A-4	2.37	2.37	164.43	Classification lab report No. 9-184-97		
		LOAM						
6.10	160.70	Bottom of boring @ 6.10 meters		6.10	160.70			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 1.46 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 1.46 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS: moist from 1.28 to 2.37m, dry from 2.37 to 6.10m

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyors

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM23 PAGE 1

BORING LOCATION: Station 237+26, 21m lt Route 29 Bypass Const B/L

BORING ELEVATION: 161.70 Meters

SUBSTRUCTURE UNIT: SWM Pond #26-1

DATE DRILLED: 9-4-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: N/A

STRATA DEPTH (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS BLOWS	ST'D. PENETRATION TEST RESULTS REC (M)	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	161.70	TOPSOIL							
0.18	161.52	Reddish-tan Sandy lean CLAY, trace of mica (CL) **BOTTOM OF POND @ 161.0 METERS**							
1.12	160.58	Tan micaceous Sandy SILT with gray veins (ML)	1.52		160.18	7-13-20	0.26		
				1.98	159.72				
2.37	159.33	Tan Sandy SILT, some mica, trace of quartz gravel fragments (ML)	3.05		158.65	7-20-29	0.26		
				3.50	158.20				
			4.57		157.13	10-14-14	0.28		
5.03	156.67	Bottom of boring @ 5.03 meters		5.03	156.67				

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.16 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.16 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

PROJECT NO: 6029-002-F22, PE101, C501

COUNTY / CITY: Albemarle

STREAM / ROAD CROSSING N/A

BENCHMARK LOCATION: provided by contract surveyor

BENCHMARK ELEVATION: n/a Meters

DRILL / METHOD USED: CME-45B

BORING NO: TB-SWM24 PAGE 1

BORING LOCATION: Station 237+07, 29m lt Route 29 Bypass Const B/L

BORING ELEVATION: 163.00 Meters

SUBSTRUCTURE UNIT: SWM Pond #26-1

DATE DRILLED: 9-4-97

LOGGED BY: P. E. Coates

DIAMOND CORE SIZE: N/A

STRATA (Meters)	DEPTHS (Meters)	STRATA ELEV (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00		163.00	TOPSOIL						
0.18		162.82		0.18		162.82			
			Reddish-tan Sandy lean CLAY, some mica (CL) A-6 ***SANDY CLAY LOAM***				Classification Lab report No. 9-183-97		
			BOTTOM OF POND @ 161.9 METERS						
2.07		160.93		2.07	2.07	160.93			
			Brown highly micaceous Sandy SILT with gray veins (ML)						
6.10		156.90			6.10	156.90			
			Bottom of boring @ 6.10 meters						

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.36 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 4.36 Meters GROUNDWATER ELEVATION: N/A @ 24 Hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM25 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 244+51, 36m lt. Route 29 Bypass Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 133.00 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #28-1

BENCHMARK LOCATION: provided by contract surveyors

DATE DRILLED: 9-8-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: J. R. Finks

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STATA DEPTHS (Meters)	STATA ELEVS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	ST'D. PENETRATION TEST RESULTS: BLOWS	ST'D. PENETRATION TEST RESULTS: REC (M)	CORING RESULTS: REC (%)	CORING RESULTS: R.Q.D. (%)
0.00	133.00	TOPSOIL							
0.24	132.76	Brown to reddish-brown Sandy SILT, some mica, trace of gravel (ML)							
1.52	131.48	Mixed brown and reddish-brown Sandy SILT, some mica, quartz, and weathered rock fragments (ML)	1.52	1.98	131.48 131.02	16-31-27	0.46		
2.59	130.41	**BOTTOM OF POND @ 130.0 METERS** Grayish-brown micaceous Silty SAND, some (ML) weathered rock fragments (decomposed bedrock)	3.00		130.00				
3.14	129.86	Unable to Penetrate (Auger Refusal) @ 3.14 meters		3.08	129.92	50-.076	0.76		

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.52 Meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: n/a Meters CAVE-IN DEPTH: 2.42 Meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

V.D.O.T.

Culpeper District

Foundation Investigation Boring Log

ROUTE: 29, Charlottesville Bypass

BORING NO: TB-SWM26 PAGE 1

PROJECT NO: 6029-002-F22, PE101, C501

BORING LOCATION: Station 244+19, 50m lt. Route 29 Bypass Const. B/L

COUNTY / CITY: Albemarle

BORING ELEVATION: 140.30 Meters

STREAM / ROAD CROSSING N/A

SUBSTRUCTURE UNIT: SWM Pond #28-1

BENCHMARK LOCATION: provided by contract surveyor

DATE DRILLED: 9-8-97

BENCHMARK ELEVATION: n/a Meters

LOGGED BY: J. R. Finks

DRILL / METHOD USED: CME-45B

DIAMOND CORE SIZE: N/A

STATA (Meters)	DEPTHS (Meters)	STATA ELEVS (Meters)	GEOLOGIC DESCRIPTION	DEPTH FROM (Meters)	DEPTH TO (Meters)	ELEV (Meters)	TYPE OF TEST	CORING RESULTS REC (%)	CORING RESULTS R.Q.D. (%)
0.00	0.18	140.30 140.12	TOPSOIL	0.18		140.12			
			Brown to reddish-brown Sandy SILT, some mica (ML) A-4(2)				Classification Lab report No. 57-64969		
1.22		139.08	Brown micaceous Silty SAND (SM) A-4(0)	1.22	1.22	139.08			
							Classification Lab report no. 57-64967		
3.66		136.64		3.66	3.66	136.64			
			Grayish-brown highly micaceous Silty SAND, some fine weathered rock fragments (SM) A-2-4(0)				Classification Lab report No. 57-64966		
7.28		133.02	**Bottom of Pond @ 130.0 Meters MSL** Unable to Penetrate (Auger Refusal) @ 7.28 meters		7.28	133.02			

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.40 meters GROUNDWATER ELEVATION: N/A @ Completion

GROUNDWATER DEPTH: dry Meters CAVE-IN DEPTH: 2.40 meters GROUNDWATER ELEVATION: N/A @ 24 hours

REMARKS:

BORING LOG

SINCE 1881®

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099

DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-1 (1 of 2) | Total Depth 21.34m | Elev: 216.69m | Location:

Type of Boring: Hollow Stem Auger | Started: 4/22/96 | Completed: 4/22/96 | Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
216.23	0.46	Driller Reported "Surficial Organic Soil"	6/6/10	0.00		
				0.46		No Sample Recovery
		Hard to Very Hard, Reddish Brown Clayey SILT, Some Mica, Trace Fine Sand - Moist (MH)	14/14/30	0.91		Groundwater was Encountered at 15.24m During Drilling
				1.22		
			20/31/50	1.68		
				2.74		Groundwater Observations were not Reported Upon Removal of Auger
			7/10/16	3.20		
				4.27		Cave-in Depth not Reported
			7/9/15	4.72		
				5.79		
			8/20/34	6.25		
				7.32		
209.07	7.62		4/17/40	7.77		
		Very Hard, Dark Grayish Brown SILT, Trace Fine Sand - Moist (Micaceous) (ML)		8.84		
			8/37/*	9.24		*50/0.09m
				10.36		
			14/*	10.64		*50/0.12m
				11.89		
			15/45/50			

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099

DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-1 (2 of 2) | Total Depth 21.34m | Elev: 216.69m | Location:

Type of Boring: Hollow Stem Auger | Started: 4/22/96 | Completed: 4/22/96 | Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Very Hard, Dark Grayish Brown SILT, Trace Fine Sand - Moist (Micaceous) (ML)		12.34		
				13.41		
202.97	13.72		17/*	13.69		*50/0.12m
		Very Hard, Gray and Tan Clayey Fine to Medium Sandy SILT - Moist (MH)				
				14.94		
			45/*	15.21		*50/0.12m
200.23	16.46			16.46		
		Very Dense, Greenish Gray and White Silty Fine to Medium SAND, Trace Clay - Moist (Micaceous) (SC)	*	16.52		*50/0.06m
				17.98		*50/0.03m
198.40	18.29		*	18.01		
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing		18.29		Started Coring Rock at 18.29m with NX Dia. Bit
					100/70	
				19.81		
					98/92	
195.35	21.34			21.34		
		Boring Terminated at 21.33m				

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-2 (1 of 4) Total Depth 39.62m Elev: 236.20m Location:

Type of Boring: Hollow Stem Auger Started: 4/26/96 Completed: 4/26/96 Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
236.01	0.18	Driller Reported "Surficial Organic Soil"	6/17/20	0.00		Groundwater Observations were not Reported
235.28	0.91	Dense, Gray and Brown Silty Fine to Coarse SAND, Trace Fine to Coarse Gravel, Trace Organics, Little Mica - Moist (SM)		0.46		
				1.22		Cave-in Depth not Reported
			*	1.28		
		Very Hard, Tan to Light Gray Fine to Medium Sandy SILT - Dry (ML)				*From 1.22m - 1.28m - 50/0.06m
				2.74		
			*	2.80		*50/0.06m
				4.27		
			*	4.30		*50/0.03m
231.62	4.57	Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Some Gray Gneiss, Very Close and Close Fracturing from 30.0' to 35.0'		4.57		Started Coring at 4.57m with NX Dia. Bit
					98/87	
				6.10		
					72/57	
				7.62		
					67/48	
				9.14		
					100/40	
				10.67		
					100/87	
				12.19		

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-2 (2 of 4) Total Depth 39.62m Elev: 236.20m Location:

Type of Boring: Hollow Stem Auger Started: 4/26/96 Completed: 4/26/96 Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Some Gray Gneiss		13.72	98/98	
				15.24	88/77	
				16.76	97/77	
				18.29	95/95	
				19.81	100/78	
				21.34	95/95	
				22.86	100/85	
				24.38	53/32	

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-2 (3 of 4) | Total Depth 39.62m | Elev: 236.20m | Location:

Type of Boring: Hollow Stem Auger | Started: 4/26/96 | Completed: 4/26/96 | Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Some Gray Gneiss		25.91	37/25	
				27.43	90/63	
				28.96	78/35	
				30.48	95/90	
				32.00	98/92	
				33.53	100/93	
				35.05	100/100	
				36.58	97/85	

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

BORING LOG

SINCE 1881®

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-2 (4 of 4) | Total Depth 39.62m | Elev: 236.20m | Location:

Type of Boring: Hollow Stem Auger | Started: 4/26/96 | Completed: 4/26/96 | Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Some Gray Gneiss		38.10	100/95	
					98/87	
196.57	39.62			39.62		
		Boring Terminated at 39.62m				

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: **X60-099** DATE: **April 30, 1996**

Client: **Virginia Department of Transportation**

Project: **VDOT Proj. #6029-002-F22,PE101**

Boring No.: **B-3** (1 of 2) | Total Depth **22.86m** | Elev: **221.90m** | Location:

Type of Boring: **Hollow Stem Auger** | Started: **4/22/96** | Completed: **4/22/96** | Driller: **Ayers**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
221.60	0.30	Driller Reported "Surficial Organic Soil"	4/4/4	0.00		Groundwater Observations were not Reported
220.99	0.91	Firm, Reddish Brown Fine to Coarse Sandy Clayey SILT, Trace Organics - Moist (MH)		0.46		
			8/17/19	1.22		Cave-in Depth not Reported
220.23	1.68	Hard, Bluish Gray SILT - Dry (Micaceous) (ML)		1.68		
219.16	2.74	Very Dense, Reddish Brown and Gray Silty Clayey Fine to Medium SAND, Trace Fine to Coarse Gravel - Moist to Dry (SM)	37/*	2.74		*50/0.09m
		Very Hard, Bluish Gray and Reddish Brown to Bluish Gray SILT, Trace Fine Sand, Little Mica, Trace Coarse Sand from 4.27m to 4.36m, Little Fine Gravel from 7.31m to 7.41m - Dry (Micaceous from 5.79m to 6.10m) (ML)	*	2.99		
				4.27		
				4.36		*50/0.09m
			30/50	5.79		
				6.10		
				7.32		
			*	7.41		*50/0.09m
			*	8.84		*At 8.84m, 50/0.00m
212.76	9.14			9.14		
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Some Gray Gneiss			95/67	Started Coring Rock at 9.14m with NX Dia. Bit
				10.67		
					100/67	
				12.19		

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

BORING LOG

SINCE 1881®

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-3 (2 of 2) Total Depth 22.86m Elev: 221.90m Location:

Type of Boring: Hollow Stem Auger Started: 4/22/96 Completed: 4/22/96 Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Some Gray Gneiss		13.72	95/77	
				15.24	93/67	
				16.76	85/33	
				18.29	98/87	
				19.81	97/67	
				21.34	100/95	
199.04	22.86			22.86	98/98	
		Boring Terminated at 22.86m				

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-4 (1 of 3) | Total Depth 35.05m | Elev: 230.76m | Location:

Type of Boring: Hollow Stem Auger | Started: 4/23/96 | Completed: 4/23/96 | Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
230.45	0.30	Driller Reported "Surficial Organic Soil"	4/8/9	0.00		
		Very Stiff, Dark Brown Fine to Medium Sandy SILT, Trace Organics, Little Fine to Coarse Gravel - Moist (ML)	4/8/9	0.46		Groundwater Observations were not Reported
				0.91		
229.54	1.22			1.22		
		Very Dense, Bluish Gray and Reddish Brown to Tan and Gray Silty Fine to Coarse SAND, Little Mica - Moist (SM)	18/40/*	1.62		Cave-in Depth not Reported
				2.74		From 0.00m to 0.46m - No Sample Recovery
			18/50	3.05		*From 1.52m to 1.62m - 50/0.09m
				4.27		
			*	4.33		*50/0.06m
226.18	4.57	Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Soft Moderately Weathered from 31.0' to 52.0'		4.57		Started Coring Rock at 4.57m with NX Dia. Bit
					100/60	
				6.10		
					100/57	
				7.62		
					0/0	
				9.14		
					100/30	
				10.67		
					47/10	
				12.19		

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

BORING LOG

SINCE 1881®

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: X60-099 DATE: April 30, 1996

Client: Virginia Department of Transportation

Project: VDOT Proj. #6029-002-F22,PE101

Boring No.: B-4 (2 of 3) | Total Depth 35.05m | Elev: 230.76m | Location:

Type of Boring: Hollow Stem Auger | Started: 4/23/96 | Completed: 4/23/96 | Driller: Ayers

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing, Soft Moderately Weathered from 31.0' to 52.0'		13.72	27/0	
				15.24	0/0	
				16.76	75/42	
				18.29	87/80	
				19.81	100/90	
				21.34	100/50	
				22.86	70/48	
207.90	22.86	Soft to Very Soft, Gray MICA SCHIST		24.38	33/0	

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

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES · ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: **X60-099** DATE: **April 30, 1996**

Client: **Virginia Department of Transportation**

Project: **VDOT Proj. #6029-002-F22,PE101**

Boring No.: **B-4** (3 of 3) | Total Depth **35.05m** | Elev: **230.76m** | Location:

Type of Boring: **Hollow Stem Auger** | Started: **4/23/96** | Completed: **4/23/96** | Driller: **Ayers**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Meters)	% CORE REC/RQD	REMARKS
		Soft to Very Soft, Gray Mica Schist		25.91	48/7	
204.54	26.21	Hard, Slightly Weathered Fine to Medium Grained METAGRAYWACKE with Medium Spaced Fracturing		27.43	100/68	
				28.96	93/67	
				30.48	95/95	
				32.00	100/83	
				33.53	100/72	
195.70	35.05			35.05	97/92	
		Boring Terminated at 35.05m				

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

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-4	S-1	1.00 - 1.75	12.4									
11BH-4	S-2	3.00 - 5.00	25.4									
11BH-4	S-3	5.00 - 7.00	15.4									
11BH-4	S-4	7.00 - 9.00	15.7									
11BH-4	S-5	9.00 - 11.00	7.1									
11BH-5	S-6	0.00 - 2.00	20.5									
11BH-5	S-7	2.00 - 4.00	7.4	SM	NP	NP	NP	16.4				
11BH-5	S-8	4.00 - 6.00	10.9									
11BH-7	S-9	0.17 - 2.00	6.9									
11BH-7	S-10	2.00 - 4.00	6.1									
11BH-7	S-11	4.00 - 6.00	8.6									
11BH-8	S-12	0.00 - 2.00	21.1									
11BH-8	S-13	2.00 - 4.00	19.0									
11BH-8	S-14	4.00 - 6.00	5.1									
11BH-9	S-15	0.00 - 2.00	14.5									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-9	S-16	2.00 - 4.00	7.2									
11BH-9	S-17	4.00 - 6.00	4.3									
11BH-9	S-18	6.00 - 8.00	4.3									
11BH-9	S-19	8.00 - 10.00	3.6									
11BH-9	S-20	13.00 - 15.00	6.8									
11BH-9	S-21	18.00 - 20.00	12.7									
11BH-9	S-22	23.00 - 25.00	16.7									
11BH-9	S-23	28.00 - 30.00	12.4									
11BH-12	S-24	0.00 - 2.00	14.7									
11BH-12	S-25	2.00 - 4.00	0.7									
11BH-12	S-26	4.00 - 6.00	10.9									
11BH-12	S-27	6.00 - 8.00	14.2									
11BH-12	S-28	8.00 - 10.00	7.4									
11BH-12	S-29	13.00 - 15.00	16.5									
11BH-12	S-30	18.00 - 20.00	16.5									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-12	S-31	23.00 - 25.00	19.4									
11BH-16	S-32	0.00 - 2.00	14.5									
11BH-16	S-33	2.00 - 4.00	5.3									
11BH-17	S-34	0.39 - 2.40	20.0									
11BH-17	S-35	2.40 - 4.40	18.0									
11BH-17	S-36	4.40 - 6.40	11.8									
11BH-20	S-37	0.00 - 2.00	18.5									
11BH-20	S-38	2.00 - 4.00	12.0									
11BH-20	S-39	4.00 - 6.00	10.3									
11BH-21	S-40	0.85 - 2.80	13.5									
11BH-21	S-41	2.80 - 4.80	18.1									
11BH-21	S-42	4.80 - 6.80	12.1									
11BH-28	S-43	0.00 - 2.00	5.4									
11BH-28	S-44	2.00 - 2.75	6.7									
11BH-30	S-45	0.00 - 2.00	13.3									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-30	S-46	2.00 - 4.00	6.2									
11BH-32	S-47	0.00 - 2.00	15.4									
11BH-32	S-48	2.00 - 4.00	8.1									
11BH-33	S-49	1.00 - 3.00	11.7									
11BH-33	S-50	3.00 - 5.00	9.9	SM	34	25	9	35.6				
11BH-33	S-51	5.00 - 7.00	8.8									
11BH-33	S-52	7.00 - 9.00	9.2									
11BH-33	S-53	9.00 - 11.00	11.4									
11BH-33	S-54	14.00 - 16.00	7.7									
11BH-35	S-55	0.00 - 2.00	14.8									
11BH-35	S-56	2.00 - 4.00	6.0									
11BH-37	S-57	0.00 - 2.00	35.4									
11BH-37	S-58	2.00 - 4.00	30.9									
11BH-37	S-59	4.00 - 6.00	17.6									
11BH-38	S-60	0.00 - 2.00	26.8									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-38	S-61	2.00 - 4.00	31.8	ML	37	35	2	56.2				
11BH-38	S-62	4.00 - 6.00	32.3									
11BH-38	S-63	6.00 - 8.00	20.5									
11BH-38	S-64	8.00 - 10.00	11.2									
11BH-41	S-65	0.00 - 2.00	20.3									
11BH-41	S-66	2.00 - 4.00	13.1									
11BH-41	S-67	4.00 - 6.00	19.0	SM	26	22	4	42.7				
11BH-41	S-68	6.00 - 8.00	18.4									
11BH-41	S-69	8.00 - 10.00	16.8									
11BH-43	S-70	0.00 - 2.00	29.0									
11BH-43	S-71	2.00 - 4.00	13.4									
11BH-44	S-72	0.00 - 2.00	27.9									
11BH-44	S-73	2.00 - 4.00	13.7									
11BH-44	S-74	4.00 - 6.00	13.7									
11BH-44	S-75	6.00 - 8.00	4.2									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-50	S-76	0.00 - 2.00	27.5									
11BH-50	S-77	2.00 - 4.00	27.7									
11BH-50	S-78	4.00 - 6.00	18.7	SM	NP	NP	NP	45.2				
11BH-50	S-79	6.00 - 8.00	16.5									
11BH-50	S-80	8.00 - 10.00	17.8									
11BH-50	S-81	13.00 - 15.00	18.9									
11BH-50	S-82	18.00 - 20.00	16.1									
11BH-50	S-83	23.00 - 25.00	19.5									
11BH-51	S-84	0.00 - 2.00	32.8									
11BH-51	S-85	2.00 - 4.00	10.6									
11BH-51	S-86	4.00 - 6.00	8.2									
11BH-51	S-87	6.00 - 8.00	6.6									
11BH-51	S-88	8.00 - 10.00	10.1									
11BH-54	S-89	0.00 - 2.00	20.8	ML	32	24	8	60.6				
11BH-55	S-90	0.00 - 2.00	19.9									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-55	S-91	2.00 - 4.00	26.0									
11BH-55	S-92	4.00 - 6.00	18.4									
11BH-55	S-93	6.00 - 8.00	14.1									
11BH-55	S-94	8.00 - 10.00	15.2	ML	NP	NP	NP	65.3				
11BH-55	S-95	13.00 - 15.00	14.0									
11BH-55	S-96	18.00 - 20.00	11.3									
11BH-55	S-97	23.00 - 25.00	14.9									
11BH-55	S-98	28.00 - 30.00	19.4									
11BH-58	S-100	2.00 - 4.00	21.3									
11BH-58	S-101	4.00 - 6.00	19.9									
11BH-58	S-102	6.00 - 8.00	17.3									
11BH-58	S-103	8.00 - 10.00	19.7									
11BH-58	S-104	13.00 - 15.00	21.9	SM	24	22	2	46.5				
11BH-58	S-105	18.00 - 20.00	20.7									
11BH-58	S-106	23.00 - 25.00	13.5									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-58	S-107	28.00 - 30.00	13.1									
11BH-58	S-99	0.00 - 2.00	16.0									
11BH-59	S-108	0.00 - 2.00	36.3	ML	37	29	8	62.0				
11BH-59	S-109	2.00 - 4.00	10.2									
11BH-59	S-110	4.00 - 5.40	11.6									
11BH-59	S-111	6.00 - 6.70	8.9									
11BH-59	S-112	8.00 - 8.50	6.3									
11BH-59	S-113	13.00 - 13.70	7.0									
11BH-59	S-114	18.00 - 20.00	21.7									
11BH-59	S-115	23.00 - 25.00	23.8									
11BH-65	S-116	0.00 - 2.00	21.8									
11BH-65	S-117	2.00 - 4.00	8.0									
11BH-65	S-118	4.00 - 6.00	9.4									
11BH-65	S-119	6.00 - 8.00	7.7									
11BH-65	S-120	8.00 - 10.00	7.8									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-65	S-121	14.00 - 14.50	8.1									
11BH-65	S-122	19.00 - 20.00	13.4									
11BH-69	S-123	0.00 - 2.00	11.6									
11BH-69	S-124	2.00 - 4.00	25.8									
11BH-69	S-125	4.00 - 6.00	4.8									
11BH-70	S-126	0.00 - 2.00	11.2									
11BH-70	S-127	2.00 - 4.00	14.6									
11BH-71	S-128	0.00 - 2.00	5.5									
11BH-71	S-129	2.00 - 4.00	7.1									
11BH-71	S-130	4.00 - 6.00	3.4									
11BH-73	S-131	0.00 - 2.00	14.6									
11BH-73	S-132	2.00 - 4.00	11.1									
11BH-73	S-133	4.00 - 6.00	4.4									
11BH-73	S-134	6.00 - 8.00	10.9									
11BH-73	S-135	8.00 - 10.00	13.6									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-77	S-136	0.42 - 1.90	23.9									
11BH-77	S-137	2.00 - 4.00	26.9									
11BH-77	S-138	4.00 - 6.00	18.6									
11BH-77	S-139	6.00 - 8.00	23.2									
11BH-77	S-140	8.00 - 10.00	16.3	SM	NP	NP	NP	36.0				
11BH-77	S-141	14.00 - 16.00	13.3									
11BH-77	S-142	19.00 - 21.00	19.5									
11BH-80	S-143	0.00 - 2.00	21.5									
11BH-80	S-144	2.00 - 4.00	28.2									
11BH-80	S-145	4.00 - 6.00	66.4									
11BH-80	S-146	6.00 - 8.00	81.2	ML	NP	NP	NP	91.7				
11BH-80	S-147	8.00 - 10.00	70.5									
11BH-80	S-148	13.00 - 15.00	74.2									
11BH-83	S-149	0.00 - 2.00	12.7									
11BH-83	S-150	2.00 - 4.00	20.2									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-83	S-151	4.00 - 6.00	21.4									
11BH-83	S-152	6.00 - 8.00	9.3									
11BH-83	S-153	8.00 - 10.00	16.1									
11BH-83	S-154	13.00 - 15.00	14.5									
11BH-83	S-155	18.00 - 20.00	17.0									
11BH-83	S-156	23.00 - 25.00	11.0									
11BH-83	S-157	28.00 - 30.00	17.7									
11BH-83	S-158	33.00 - 35.00	13.2									
11BH-88	S-159	0.00 - 2.00	33.2									
11BH-88	S-160	2.00 - 4.00	33.0									
11BH-88	S-161	4.00 - 6.00	20.4									
11BH-88	S-162	6.00 - 8.00	33.4	MH	59	37	22	85.2				
11BH-88	S-163	8.00 - 10.00	34.2									
11BH-88	S-164	13.00 - 15.00	29.2									
11BH-94	S-165	0.00 - 2.00	12.2									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-94	S-166	2.00 - 4.00	17.4									
11BH-94	S-167	4.00 - 6.00	18.8									
11BH-94	S-168	6.00 - 8.00	11.7									
11BH-94	S-169	8.00 - 10.00	21.6									
11BH-99	S-170	0.00 - 2.00	41.7									
11BH-99	S-171	2.00 - 4.00	19.2									
11BH-99	S-172	4.00 - 6.00	21.7									
11BH-99	S-173	6.00 - 8.00	9.9									
11BH-99	S-174	8.00 - 10.00	8.2									
11BH-101	S-175	0.00 - 2.00	25.7									
11BH-101	S-176	2.00 - 4.00	19.1									
11BH-101	S-177	4.00 - 6.00	14.7									
11BH-101	S-178	6.50 - 7.50	16.5									
11BH-101	S-179	8.00 - 10.00	11.7									
11BH-101	S-180	13.00 - 15.00	3.3									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-101	S-181	18.00 - 20.00	11.2									
11BH-103	S-182	0.00 - 2.00	29.5	MH	68	36	32	77.9				
11BH-103	S-183	2.00 - 4.00	10.8									
11BH-103	S-184	4.00 - 6.00	7.5									
11BH-103	S-185	6.00 - 8.00	7.3									
11BH-103	S-186	8.00 - 10.00	10.7									
11BH-103	S-187	13.00 - 15.00	11.9									
11BH-103	S-188	18.00 - 20.00	6.9									
11BH-104	S-189	0.00 - 2.00	17.2									
11BH-104	S-190	2.00 - 4.00	22.9									
11BH-104	S-191	4.00 - 6.00	14.8									
11BH-104	S-192	6.00 - 8.00	15.1									
11BH-104	S-193	8.00 - 10.00	19.3									
11BH-104	S-194	13.00 - 15.00	14.9									
11BH-104	S-195	18.00 - 20.00	17.4									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

ECS Mid-Atlantic, LLC
Richmond, VA
Laboratory Testing Summary

Printed on (date): November 04, 2011

Project No. 10318 **Project Name.** 36 - Route 29 Bypass

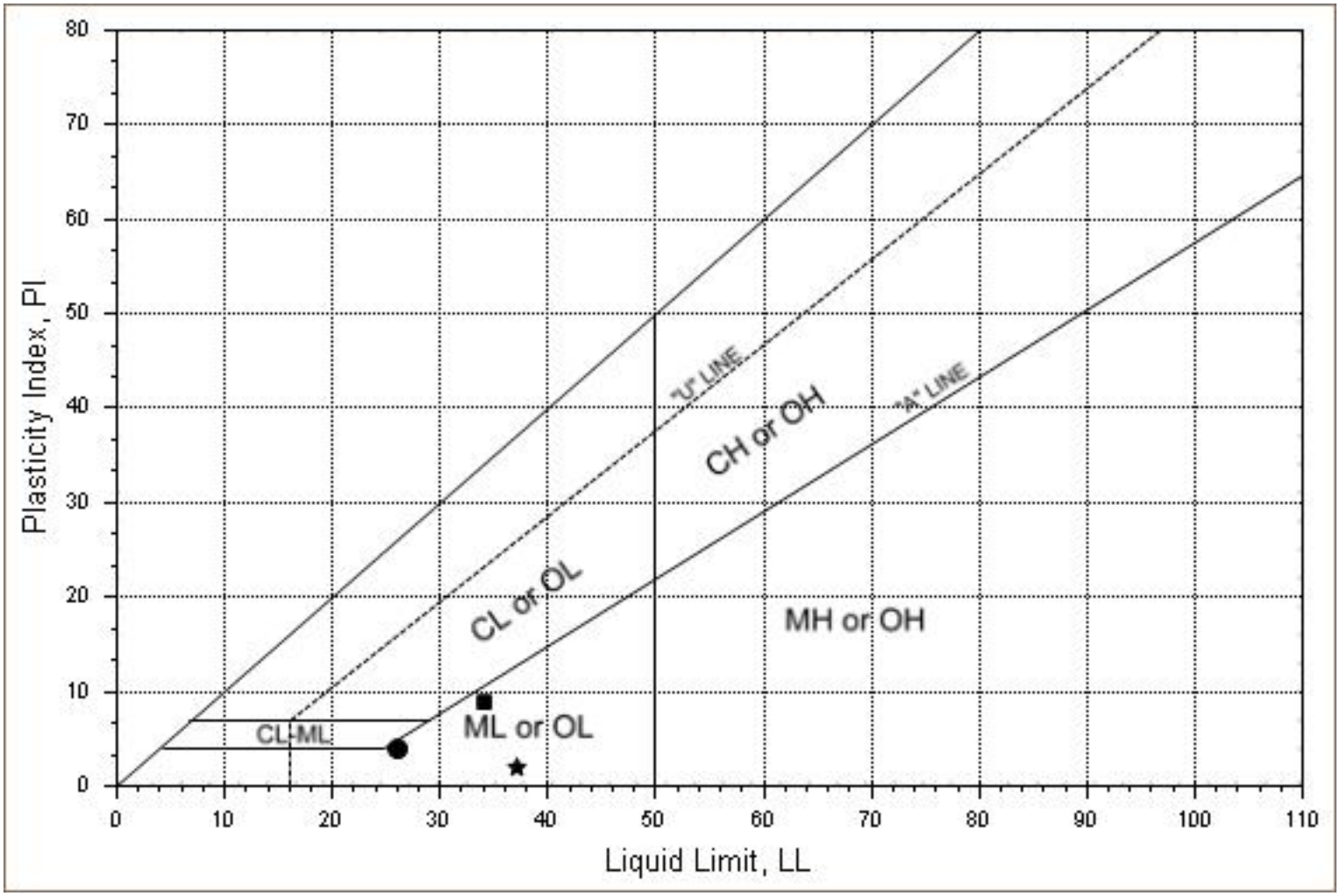
Project Engineer Michael T. Coffey **Principal Engineer** Michael T. Coffey **Summary By** Brian M. Jasion

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
11BH-104	S-196	23.00 - 25.00	35.4									
11BH-106	S-197	0.00 - 2.00	16.4									
11BH-106	S-198	2.00 - 4.00	16.9									
11BH-106	S-199	4.00 - 6.00	15.6									
11BH-106	S-200	6.00 - 8.00	27.5									
11BH-106	S-201	8.00 - 10.00	11.0									
11BH-119	S-202	1.00 - 3.00	23.5									
11BH-124	S-203	0.00 - 2.00	23.6									
11BH-124	S-204	2.00 - 4.00	20.4									
11BH-124	S-205	4.00 - 6.00	18.3									
11BH-124	S-206	6.00 - 8.00	17.8									
11BH-124	S-207	8.00 - 9.50	18.2									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Atterberg Limits (ASTM D 4318) Test Summary (Method A)



All samples are prepared using 'DRY' method unless otherwise noted

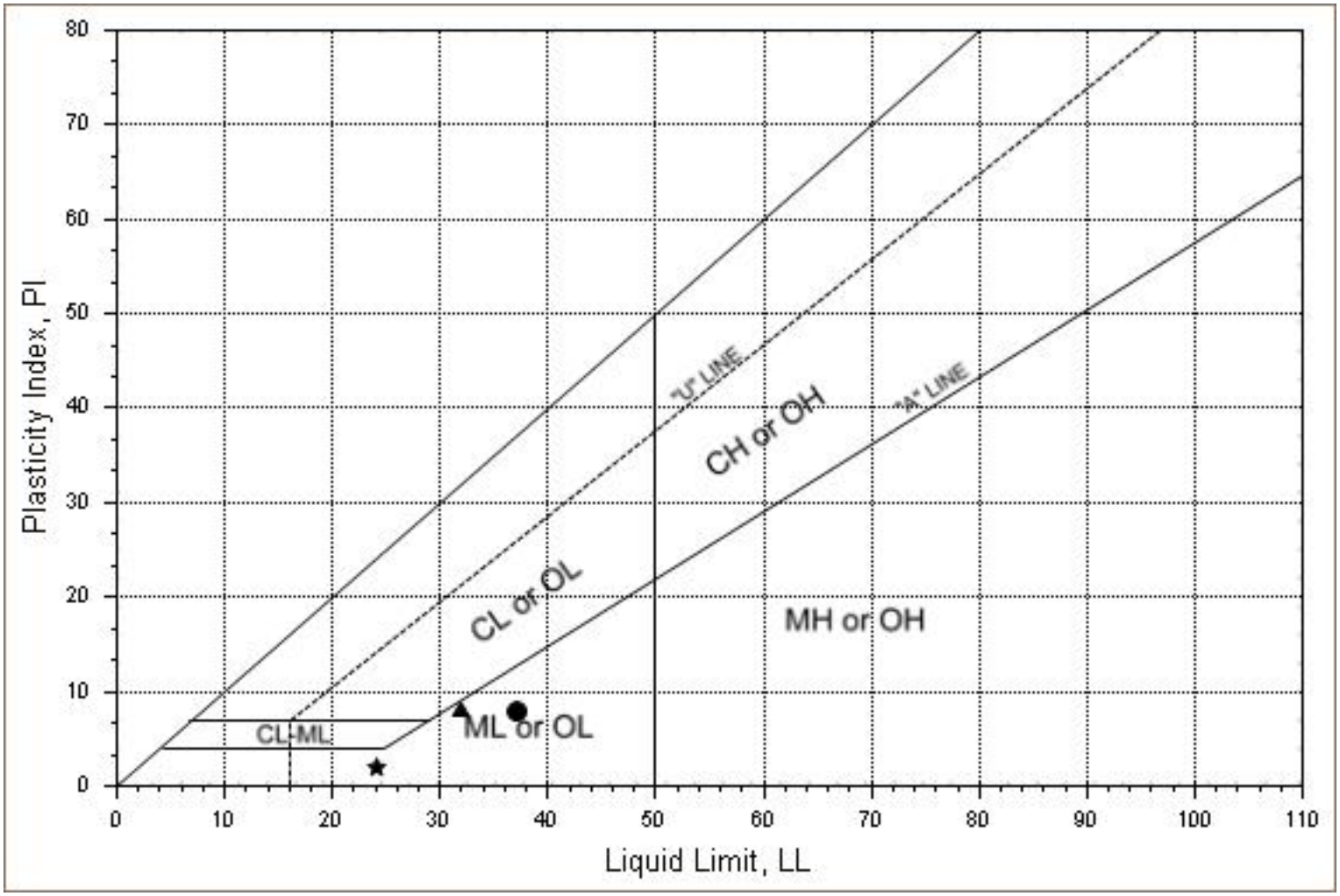
Boring Number Sample Number	Depth (feet)	Test Symbol	Description	MC (%)	LL	PL	PI	% Passing #200 Sieve	% Sample Retained on #40 Sieve	Notes
11BH-5 / S-7	2.00 - 4.00	▲	Gray Silty Sand	7.4	NP	NP	NP	16.4	42.9	
11BH-33 / S-50	3.00 - 5.00	■	Red Silty Sand	9.9	34	25	9	35.6	27.1	
11BH-38 / S-61	2.00 - 4.00	★	Red-Brown Sandy Silt	31.8	37	35	2	56.2	15.3	
11BH-41 / S-67	4.00 - 6.00	●	Brown Silty Sand	19.0	26	22	4	42.7	24.1	
11BH-50 / S-78	4.00 - 6.00	◆	Red-Brown Silty Sand	18.7	NP	NP	NP	45.2	----	

Project No.	10318
Project Name:	36 - Route 29 Bypass
PM:	Michael T. Coffey
PE:	Michael T. Coffey
Approved Date:	November 02, 2011

ECS Mid-Atlantic, LLC

Richmond, VA

Atterberg Limits (ASTM D 4318) Test Summary (Method A)



All samples are prepared using 'DRY' method unless otherwise noted

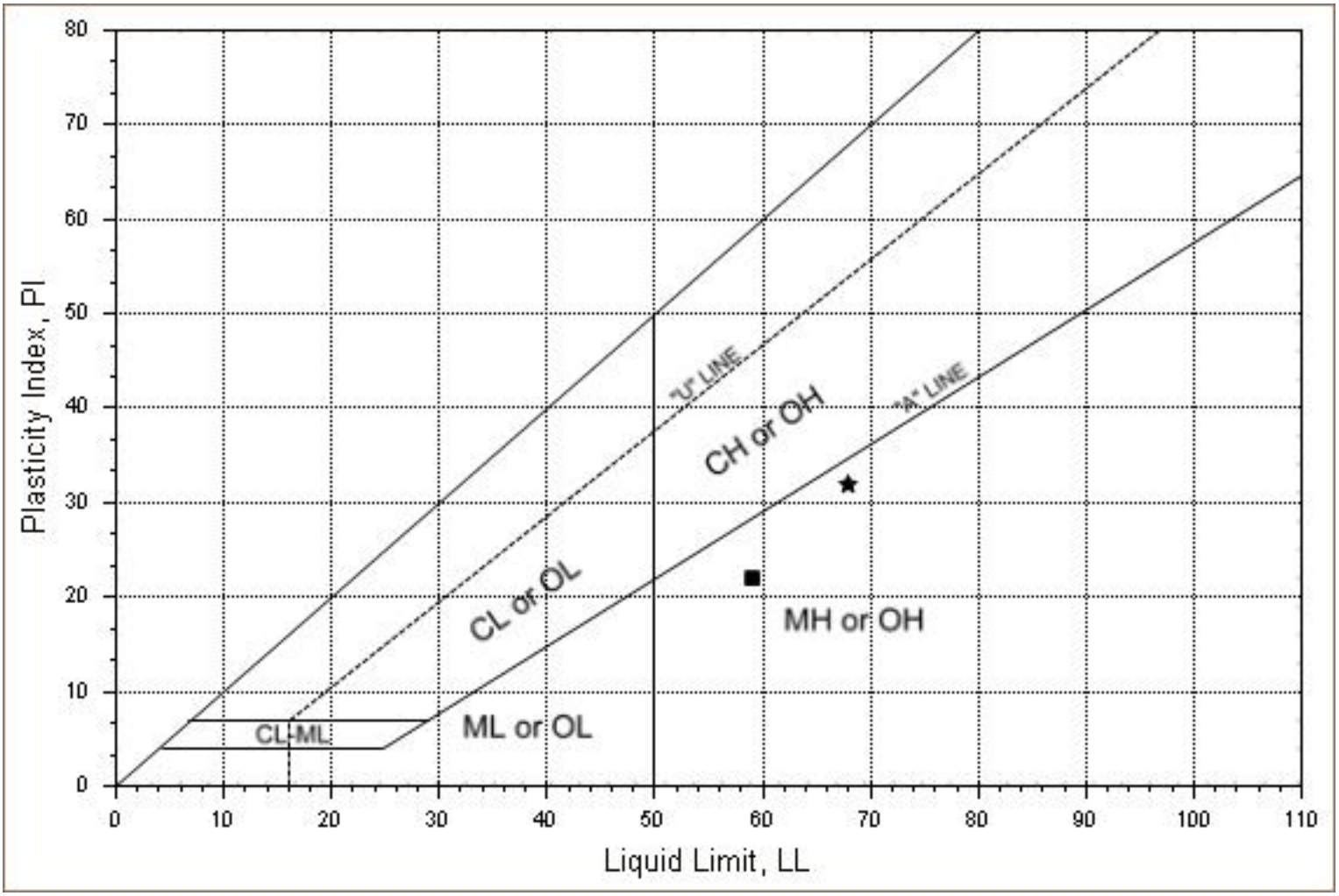
Boring Number Sample Number	Depth (feet)	Test Symbol	Description	MC (%)	LL	PL	PI	% Passing #200 Sieve	% Sample Retained on #40 Sieve	Notes
11BH-54 / S-89	0.00 - 2.00	▲	Brown Sandy Silt	20.8	32	24	8	60.6	14.5	
11BH-55 / S-94	8.00 - 10.00	■	Red Sandy Silt	15.2	NP	NP	NP	65.3	9.1	
11BH-58 / S-104	13.00 - 15.00	★	Brown Silty Sand	21.9	24	22	2	46.5	18.4	
11BH-59 / S-108	0.00 - 2.00	●	Red-Brown Sandy Silt	36.3	37	29	8	62.0	7.3	
11BH-77 / S-140	8.00 - 10.00	◆	Yellow-Brown Silty Sand	16.3	NP	NP	NP	36.0	16.4	

Project No.	10318
Project Name:	36 - Route 29 Bypass
PM:	Michael T. Coffey
PE:	Michael T. Coffey
Approved Date:	November 02, 2011

ECS Mid-Atlantic, LLC

Richmond, VA

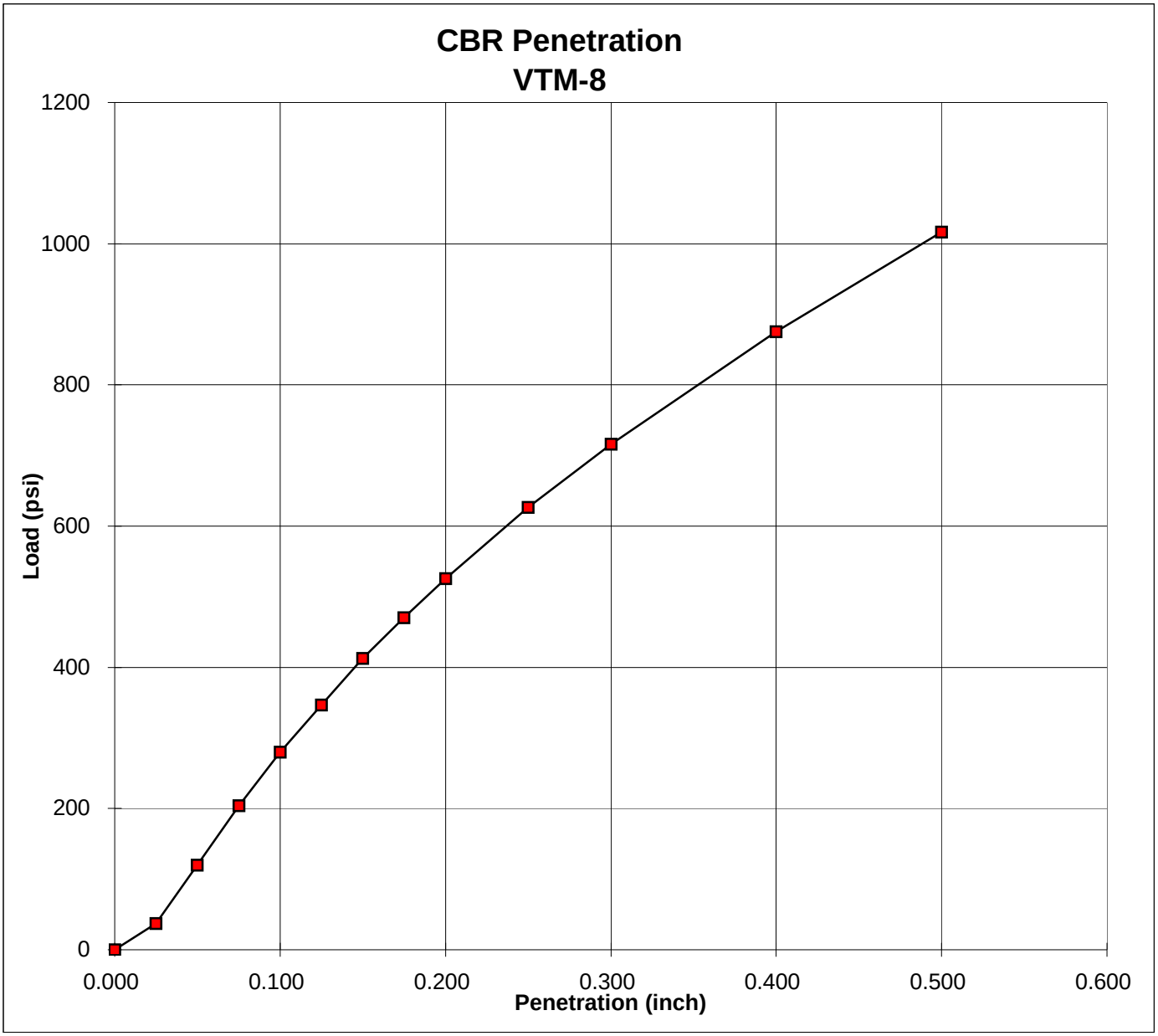
Atterberg Limits (ASTM D 4318) Test Summary (Method A)



All samples are prepared using 'DRY' method unless otherwise noted

Boring Number Sample Number	Depth (feet)	Test Symbol	Description	MC (%)	LL	PL	PI	% Passing #200 Sieve	% Sample Retained on #40 Sieve	Notes
11BH-80 / S-146	6.00 - 8.00	▲	Red-Brown Silt	81.2	NP	NP	NP	91.7	0.1	
11BH-88 / S-162	6.00 - 8.00	■	Red-Brown Elastic Silt	33.4	59	37	22	85.2	1.7	
11BH-103 / S-182	0.00 - 2.00	★	Red Elastic Silt w/ Sand	29.5	68	36	32	77.9	3.6	

Project No.	10318		**ECS Mid-Atlantic, LLC**
Project Name:	36 - Route 29 Bypass		
PM:	Michael T. Coffey		
PE:	Michael T. Coffey		**Richmond, VA**
Approved Date:	November 02, 2011		

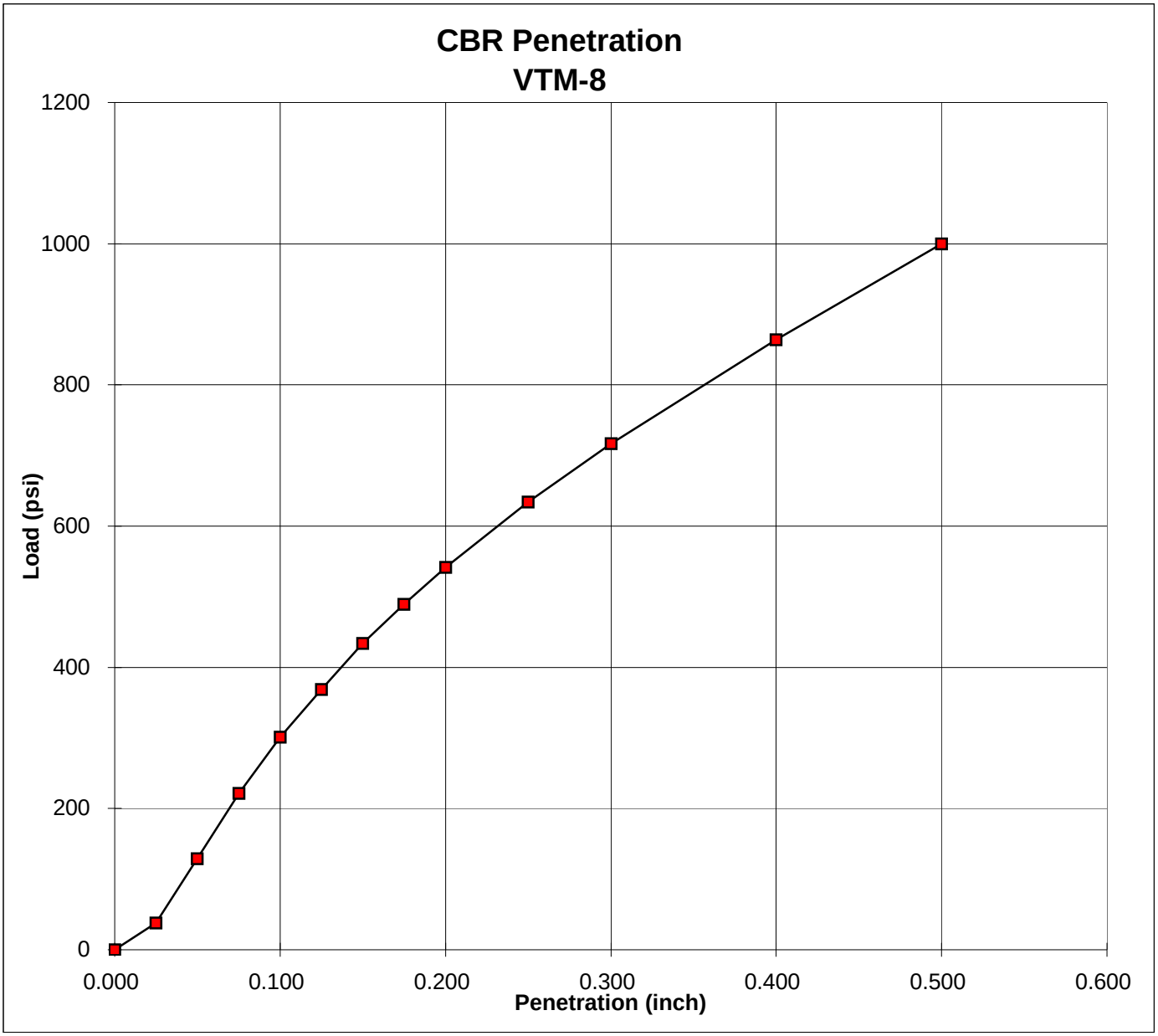


Sample No.:	CBR-1	Street:	BH-032 0-6'
Description:	Gray, Brown & Red Silty Sand, Trace Mica	Station No.:	0
Classification:	SM	Remark:	

Maximum Dry Density (pcf)	121.0		
Opt. Moisture Content (%)	12.0	Corrected CBR @ 0.1"	31.4
Natural Moisture Content	7.8	Corrected CBR @ 0.2"	37.0
Liquid Limit (LL)	21	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	123.3
Plasticity Index (PI)	NP	Molded Moisture Content	11.7
Liquidity Index (LI)		Percent of Maximum Density	101.9
Percent Retained 3/4" Sieve	1.0	Moisture Content +/- Opt	-0.3
Percent Retained No. 4 Sieve	4.0	Percent (%)Swell	0.2
Percent Passing No.200 Sieve	40.7		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

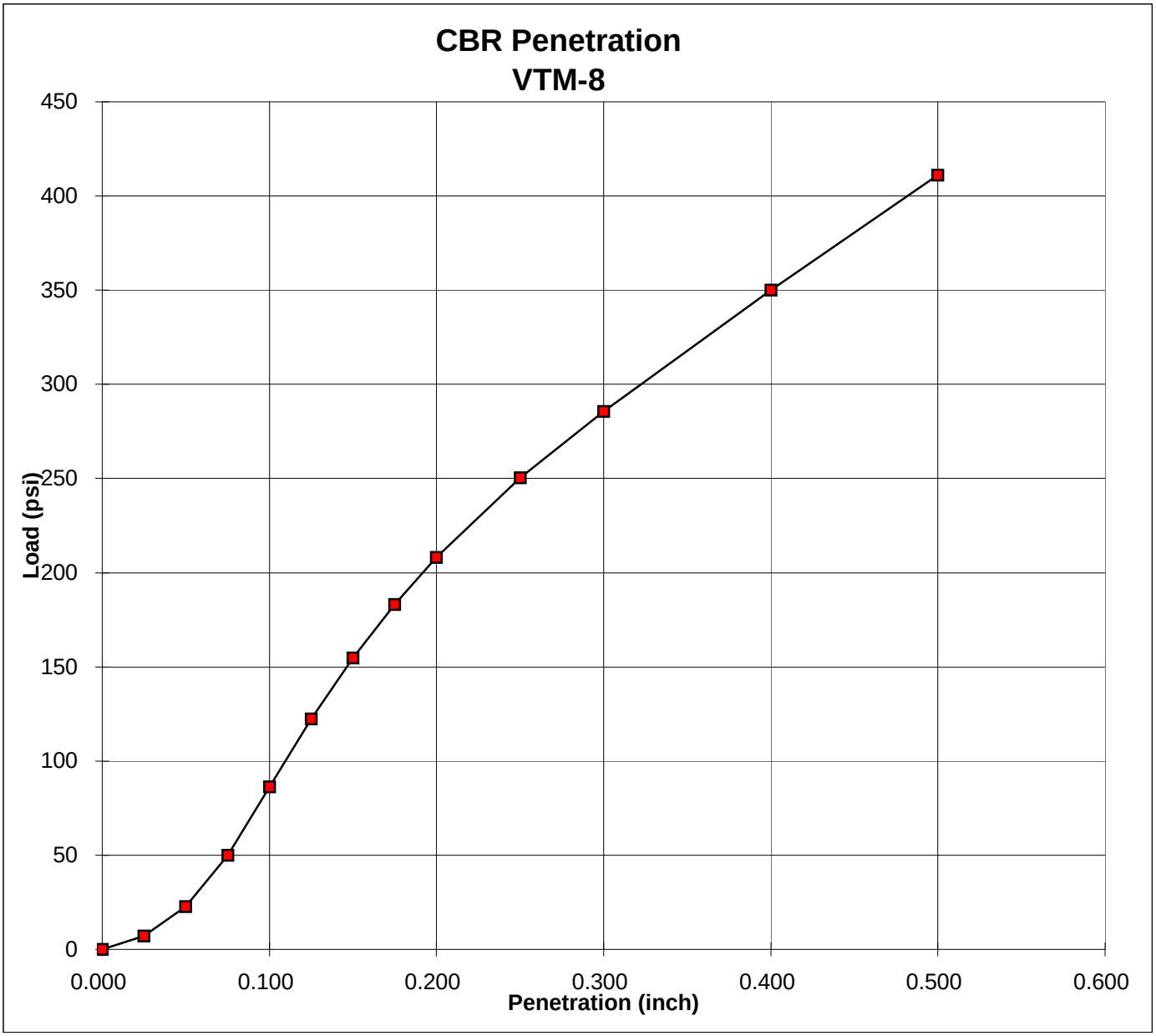


Sample No.:	CBR-1 Retest	Street:	BH-032 0-6'
Description:	Gray Brown & Red Silty Sand, Trace Mica	Station No.:	0
Classification:	SM	Remark:	

Maximum Dry Density (pcf)	121.0		
Opt. Moisture Content (%)	12.0	Corrected CBR @ 0.1"	34.9
Natural Moisture Content	7.8	Corrected CBR @ 0.2"	38.3
Liquid Limit (LL)	21	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	123.6
Plasticity Index (PI)	NP	Molded Moisture Content	11.7
Liquidity Index (LI)		Percent of Maximum Density	102.1
Percent Retained 3/4" Sieve	1.0	Moisture Content +/- Opt	-0.3
Percent Retained No. 4 Sieve	4.0	Percent (%)Swell	0.3
Percent Passing No.200 Sieve	40.7		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

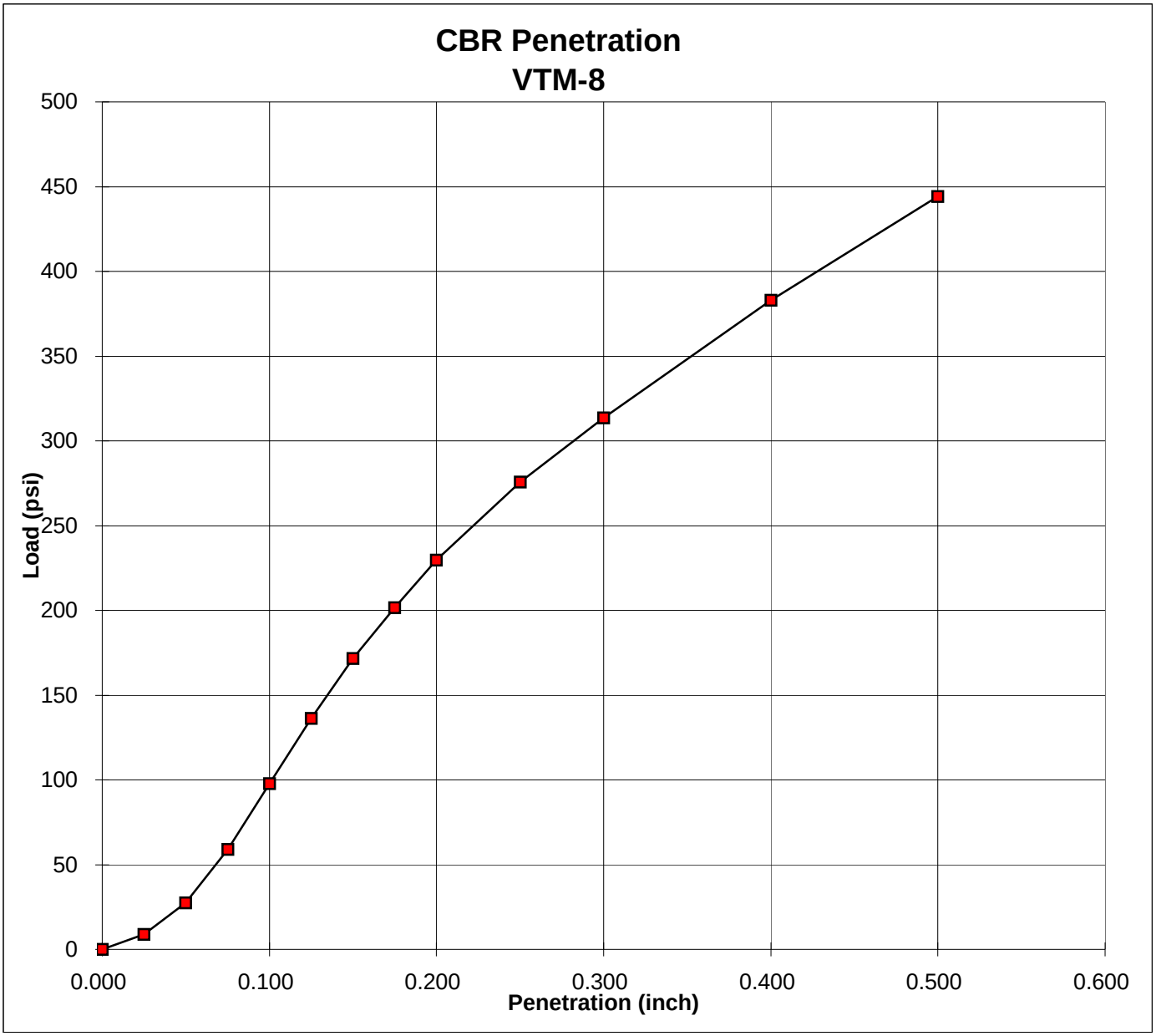


Sample No.:	CBR-2	Street:	BH-055 0-10'
Description:	Brown Silty Sand, Trace Mica	Station No.:	0
Classification:	SM	Remark:	

Maximum Dry Density (pcf)	104.0		
Opt. Moisture Content (%)	18.0	Corrected CBR @ 0.1"	13.8
Natural Moisture Content	15.0	Corrected CBR @ 0.2"	16.0
Liquid Limit (LL)	32	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	104.1
Plasticity Index (PI)	NP	Molded Moisture Content	18.7
Liquidity Index (LI)		Percent of Maximum Density	100.1
Percent Retained 3/4" Sieve	0.0	Moisture Content +/- Opt	0.7
Percent Retained No. 4 Sieve	0.0	Percent (%)Swell	1.3
Percent Passing No.200 Sieve	48.3		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/11 Revised 11/3/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

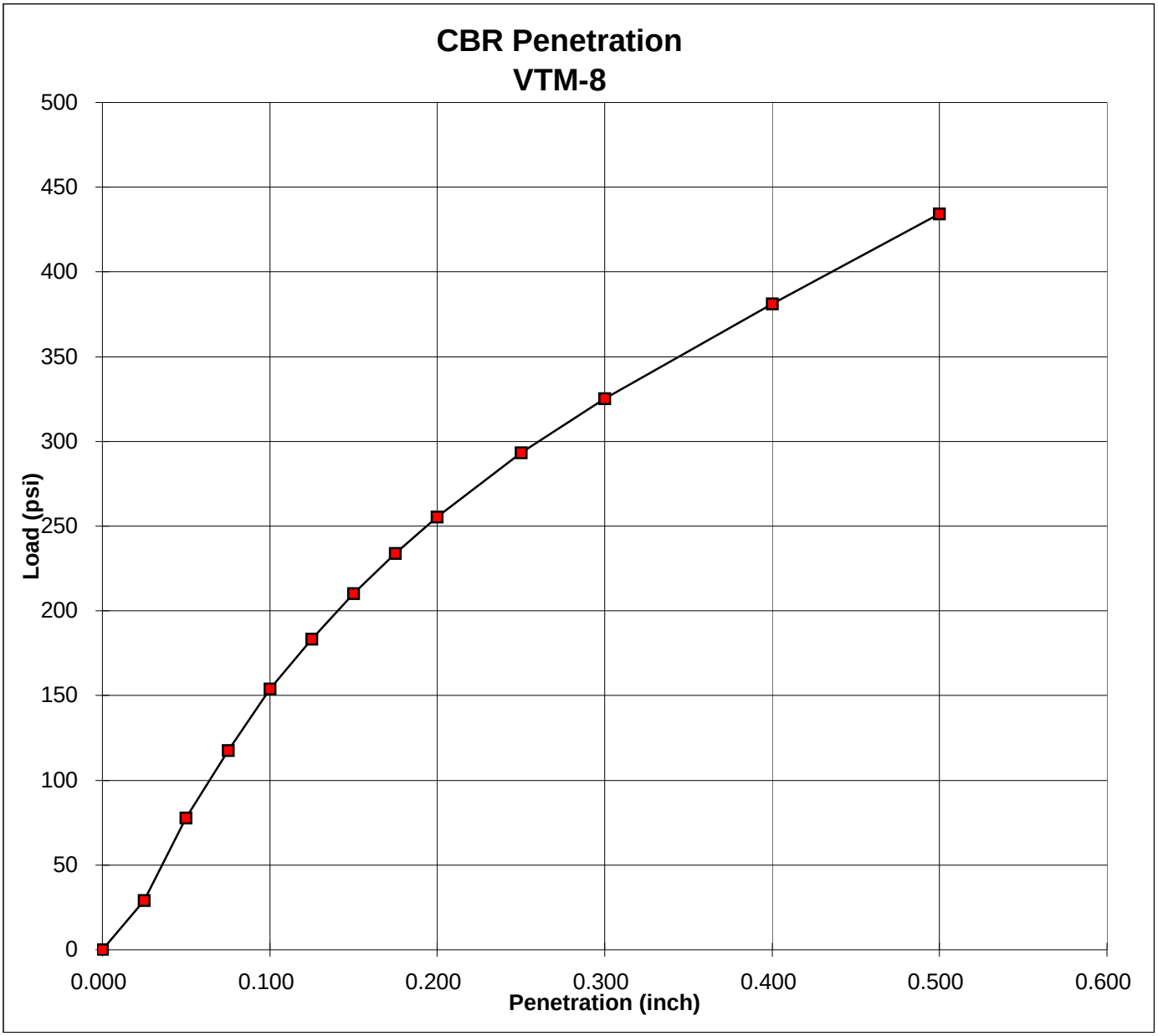


Sample No.:	CBR-2 Retest	Street:	BH-055 0-10'
Description:	Brown Silty Sand, Trace Mica	Station No.:	0
Classification:	SM	Remark:	

Maximum Dry Density (pcf)	104.0		
Opt. Moisture Content (%)	18.0	Corrected CBR @ 0.1"	15.2
Natural Moisture Content	15.0	Corrected CBR @ 0.2"	17.6
Liquid Limit (LL)	32	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	104.2
Plasticity Index (PI)	NP	Molded Moisture Content	18.6
Liquidity Index (LI)		Percent of Maximum Density	100.2
Percent Retained 3/4" Sieve	0.0	Moisture Content +/- Opt	0.6
Percent Retained No. 4 Sieve	0.0	Percent (%)Swell	1.1
Percent Passing No.200 Sieve	48.3		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/110/18/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

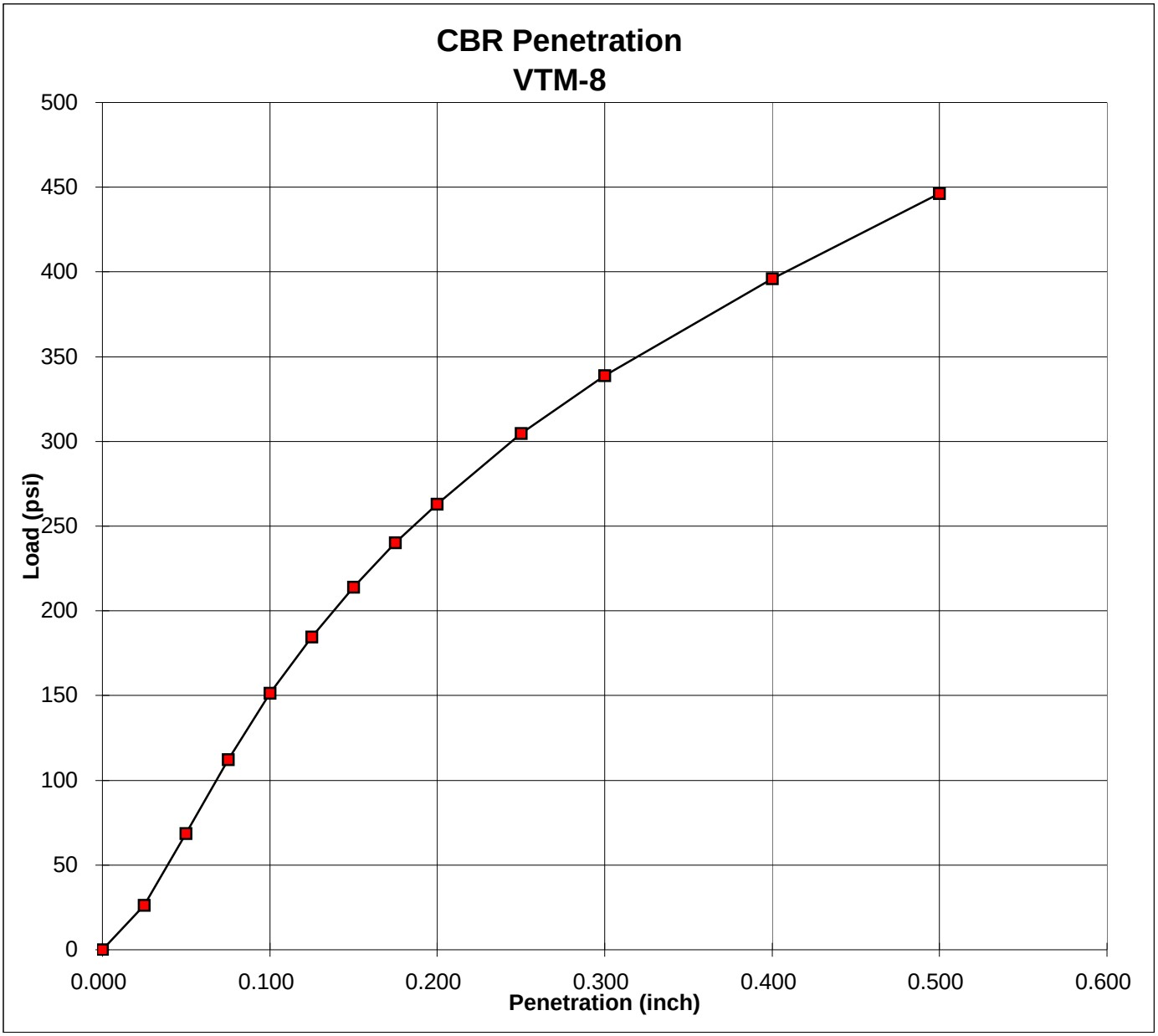


Sample No.:	CBR-3	Street:	BH-104 0-10'
Description:	Brown & Red Sandy Silt, Trace Mica	Station No.:	0
Classification:	ML	Remark:	

Maximum Dry Density (pcf)	107.0		
Opt. Moisture Content (%)	18.0	Corrected CBR @ 0.1"	16.6
Natural Moisture Content		Corrected CBR @ 0.2"	17.6
Liquid Limit (LL)	30	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	107.7
Plasticity Index (PI)	NP	Molded Moisture Content	17.5
Liquidity Index (LI)		Percent of Maximum Density	100.7
Percent Retained 3/4" Sieve	0.0	Moisture Content +/- Opt	-0.5
Percent Retained No. 4 Sieve	4.0	Percent (%)Swell	0.7
Percent Passing No.200 Sieve	50.2		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/11 Revised 11/3/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

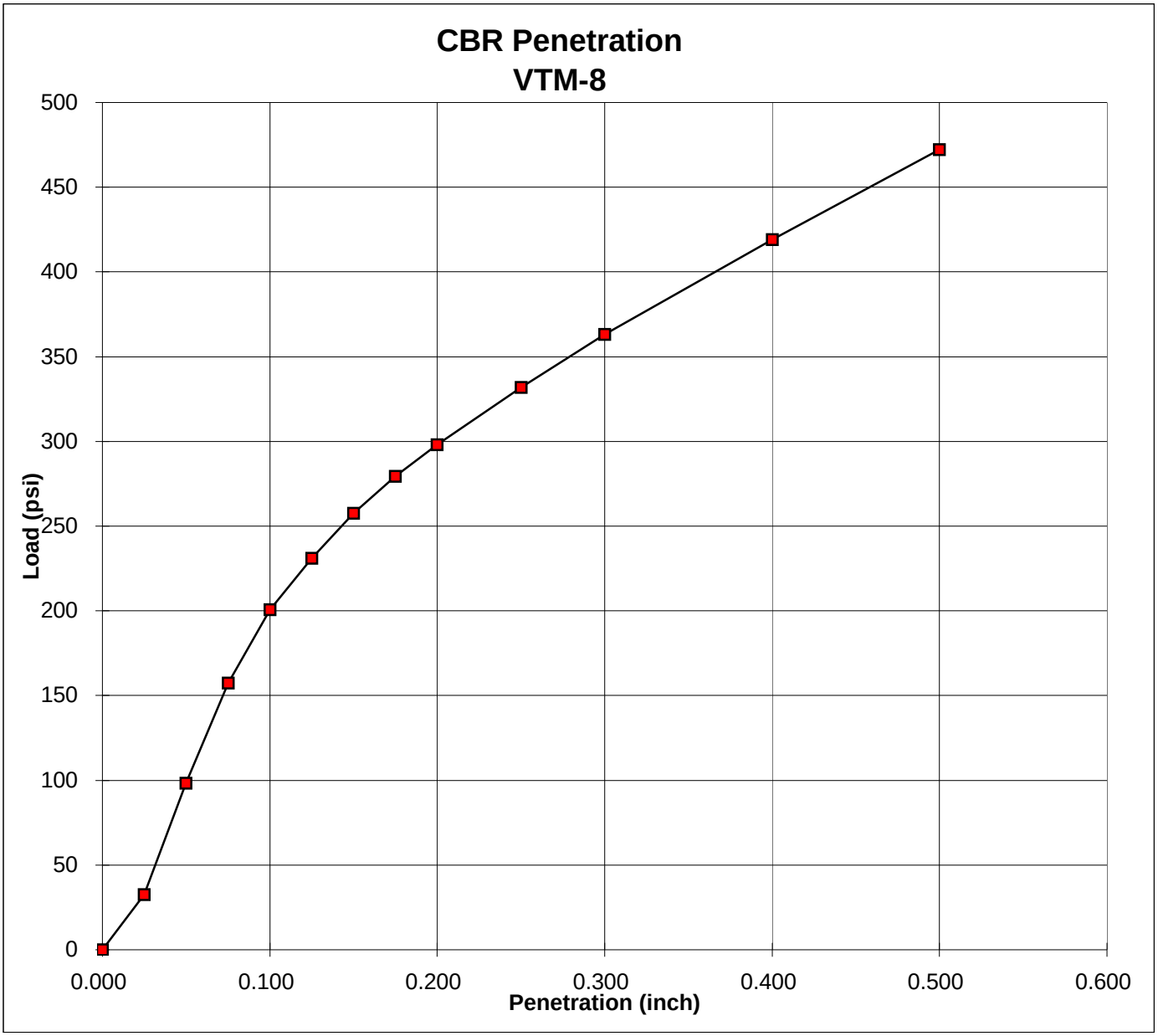


Sample No.:	CBR-3 Retest	Street:	BH-104 0-10'
Description:	Brown & Red Sandy Silt, Trace Mica	Station No.:	0
Classification:	ML	Remark:	

Maximum Dry Density (pcf)	107.0		
Opt. Moisture Content (%)	18.0	Corrected CBR @ 0.1"	16.4
Natural Moisture Content		Corrected CBR @ 0.2"	18.1
Liquid Limit (LL)	30	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	107.2
Plasticity Index (PI)	NP	Molded Moisture Content	17.6
Liquidity Index (LI)		Percent of Maximum Density	100.2
Percent Retained 3/4" Sieve	0.0	Moisture Content +/- Opt	-0.4
Percent Retained No. 4 Sieve	4.0	Percent (%)Swell	0.7
Percent Passing No.200 Sieve	50.2		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/11 Revised 11/3/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

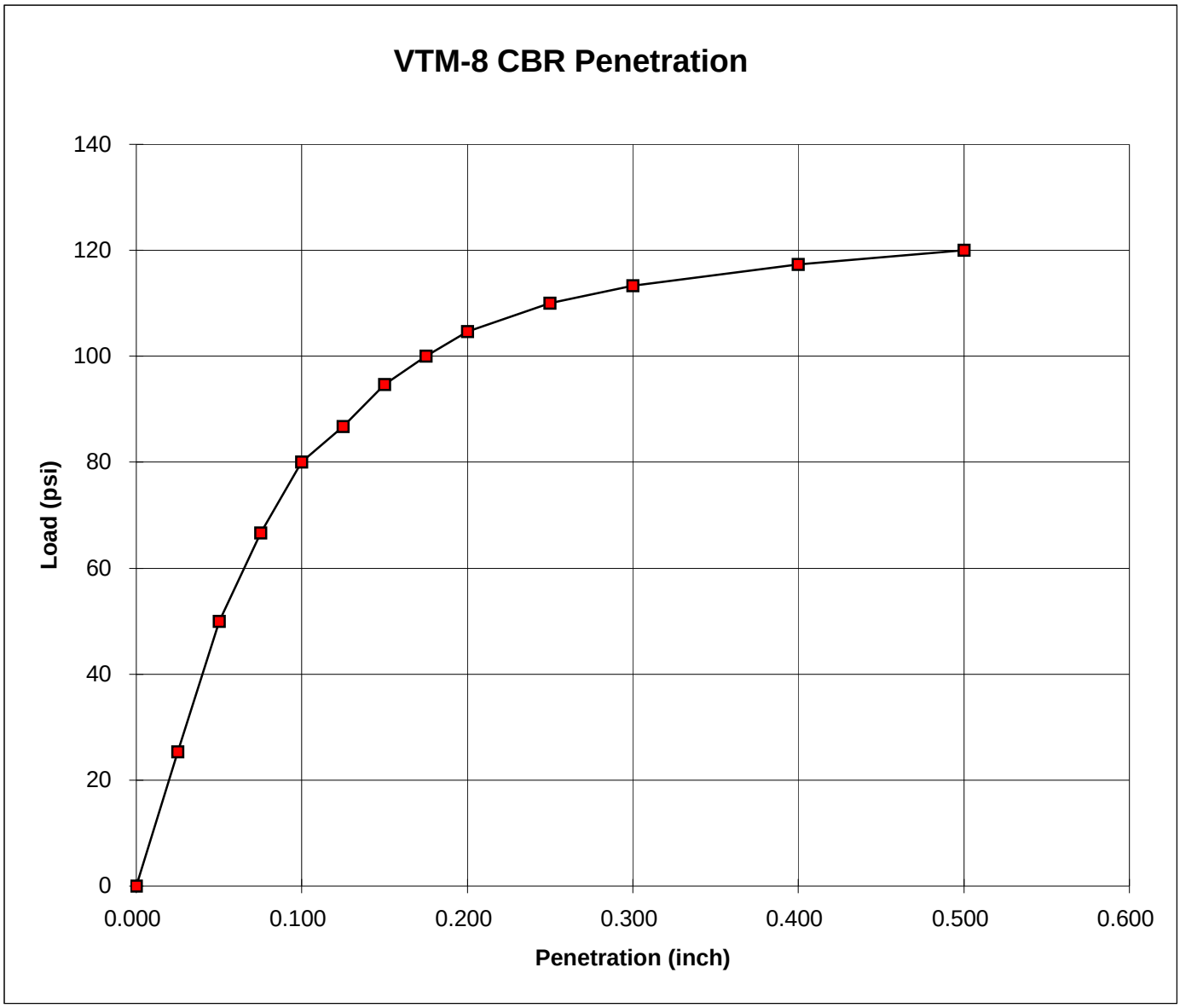


Sample No.:	CBR-4	Street:	BH-124 0-10'
Description:	Dark Green Sandy Silt	Station No.:	0
Classification:	ML	Remark:	

Maximum Dry Density (pcf)	104.0		
Opt. Moisture Content (%)	19.0	Corrected CBR @ 0.1"	21.7
Natural Moisture Content		Corrected CBR @ 0.2"	20.5
Liquid Limit (LL)	31	Compaction Effort (Blows)	65.0
Plastic Limit (PL)	NP	Dry Density as Molded	104.7
Plasticity Index (PI)	NP	Molded Moisture Content	18.9
Liquidity Index (LI)		Percent of Maximum Density	100.7
Percent Retained 3/4" Sieve	1.0	Moisture Content +/- Opt	-0.1
Percent Retained No. 4 Sieve	6.0	Percent (%)Swell	0.7
Percent Passing No.200 Sieve	63.4		

Project: 36 - Route 29 Bypass
Project No.: 5924
Date: 10/18/11 Revised 11/3/11

ECS Mid-Atlantic, LLC
Fredericksburg, Virginia

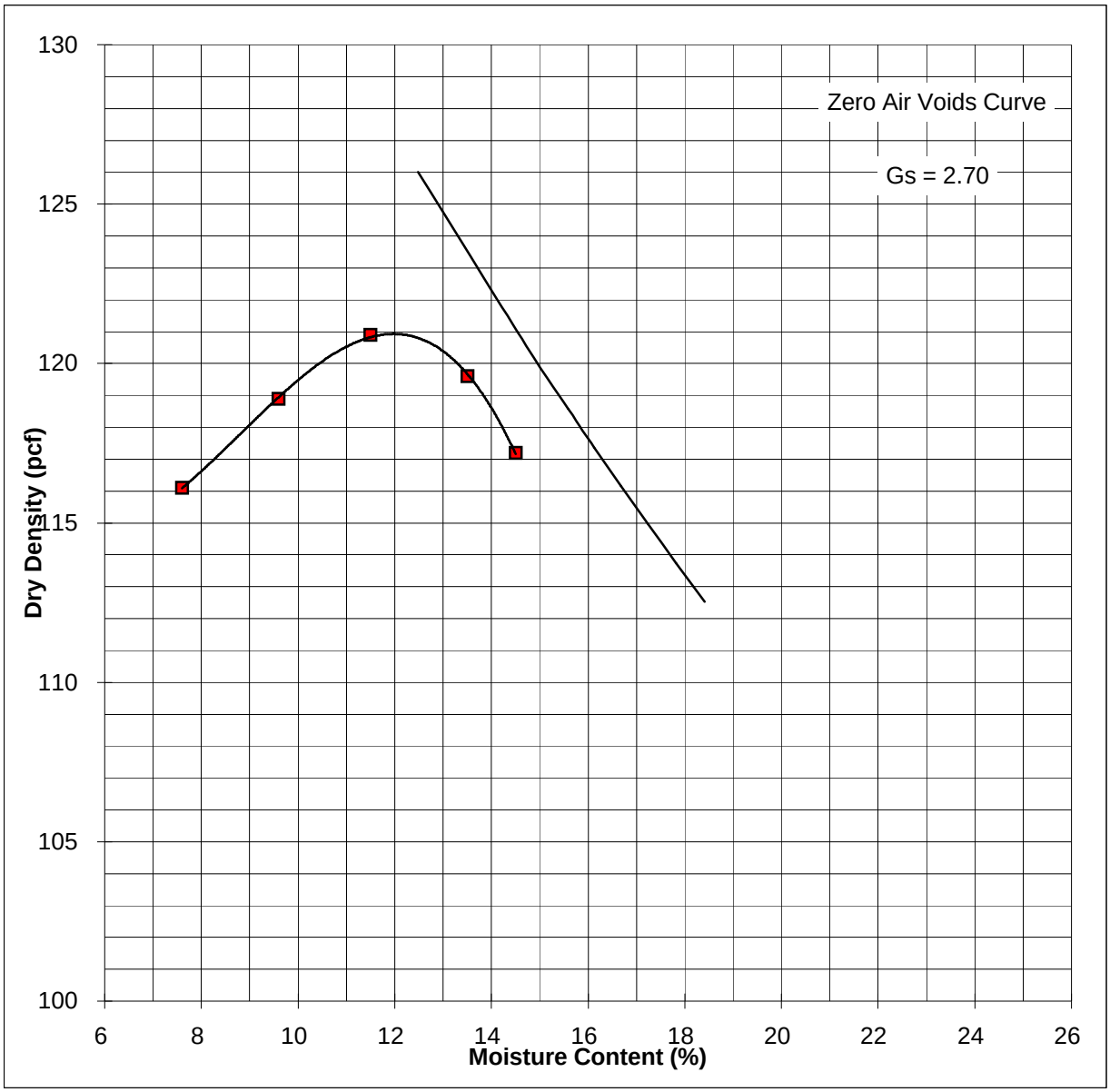


Street:	11BH-002 (2.0-6.0) Route 29 Bypass	Sample #:	CBR-5
Description:	Yellow-Brown, Sandy Silt, Trace Mica	Station No.:	_
Classification:	ML	Remarks:	

Maximum Dry Density (pcf)	108.4		Soaked
Opt. Moisture Content (%)	17.8	Corrected CBR @ 0.1"	8.0
Natural Moisture Content	20.2		
Liquid Limit (LL)	NP	Corrected CBR @ 0.2"	7.0
Plastic Limit (PL)	NP	Dry Density as Molded	109.0
Plasticity Index (PI)	NP	Molded Moisture Content	17.6
AASHTO	A-4	Percent of Maximum Density	100.6
Percent Retained 3/4" Sieve	2.8	Moisture Content +/- Opt	-0.2
Percent Retained No. 4 Sieve	7.6	Percent (%)Swell	1.3
Percent Passing No.200 Sieve	66.9	Resiliency Factor	1.5

Project: Route 29 Bypass	**ECS Mid-Atlantic, LLC**
Project No.: 36 1061	**Chantilly, Virginia**
Performed Date: 9/29/11	**California Bearing Ratio Curve**

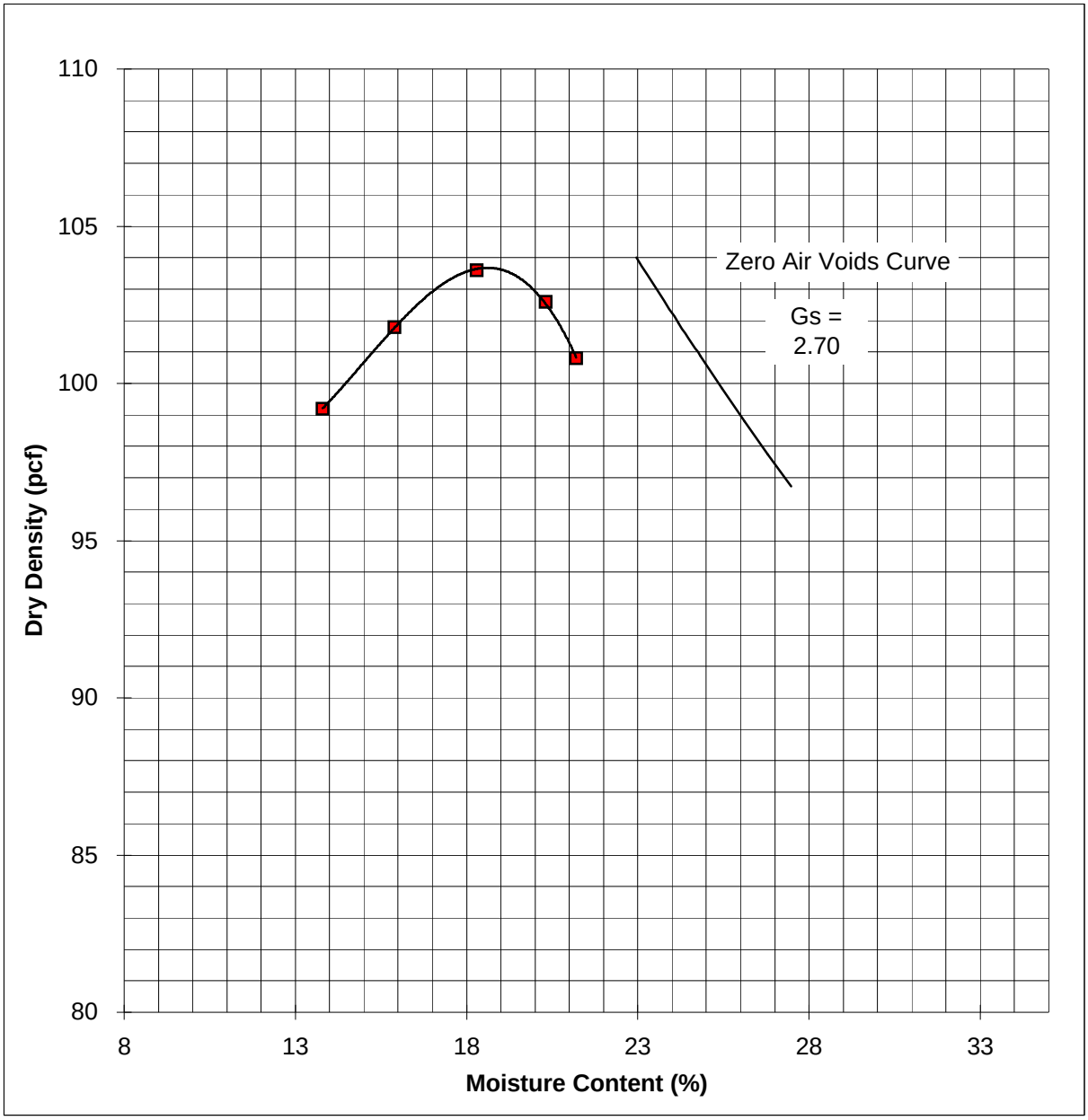
115388C.xls



Sample No.	CBR-1	Natural Moisture Content	7.8
Street	BH-032, 0-6'	Percent Passing No. 200 Sieve	40.7
Station		Percent Retained on No. 4 Sieve	3.9
Liquid Limit (LL)	21	Percent Retained on 3/4" Sieve	1.0
Plastic Limit (PL)	NP	Maximum Dry Density (pcf)	121.0
Plasticity Index (PI)	NP	Optimum Moisture Content (%)	12.0
Liquidity Index (LI)		Corr. Maximum Dry Density (pcf)	121.0
Description	Gray, Brown & Red Silty Sand, Trace Mica	Corr. Optimum Moisture Content (%	12.0
Classification	SM	Percent (%) Gravel as Tested	0.0
Specific Gravity	2.70	Percent (%) Gravel Total	3.9
Test Standard	VTM-1	Test Method	A

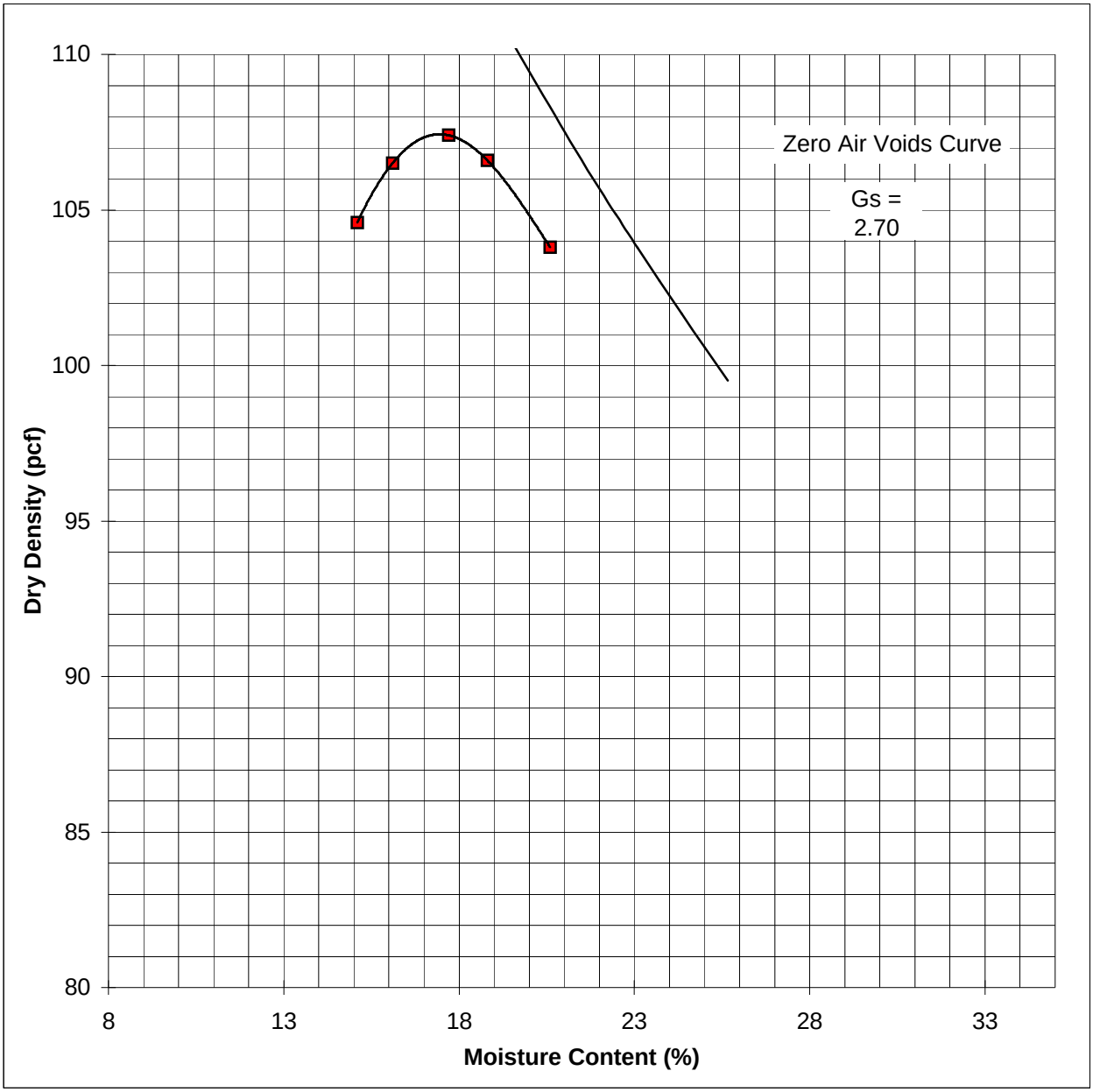
Project: 36 - Route 29 Bypass	**ECS Mid-Atlantic, LLC**
Project No.: 5924	**Fredericksburg, Virginia**
Date: 11/3/11	**Moisture Density Relationship Curve**

5924 cbr1-4 Proctor Revised2.xls



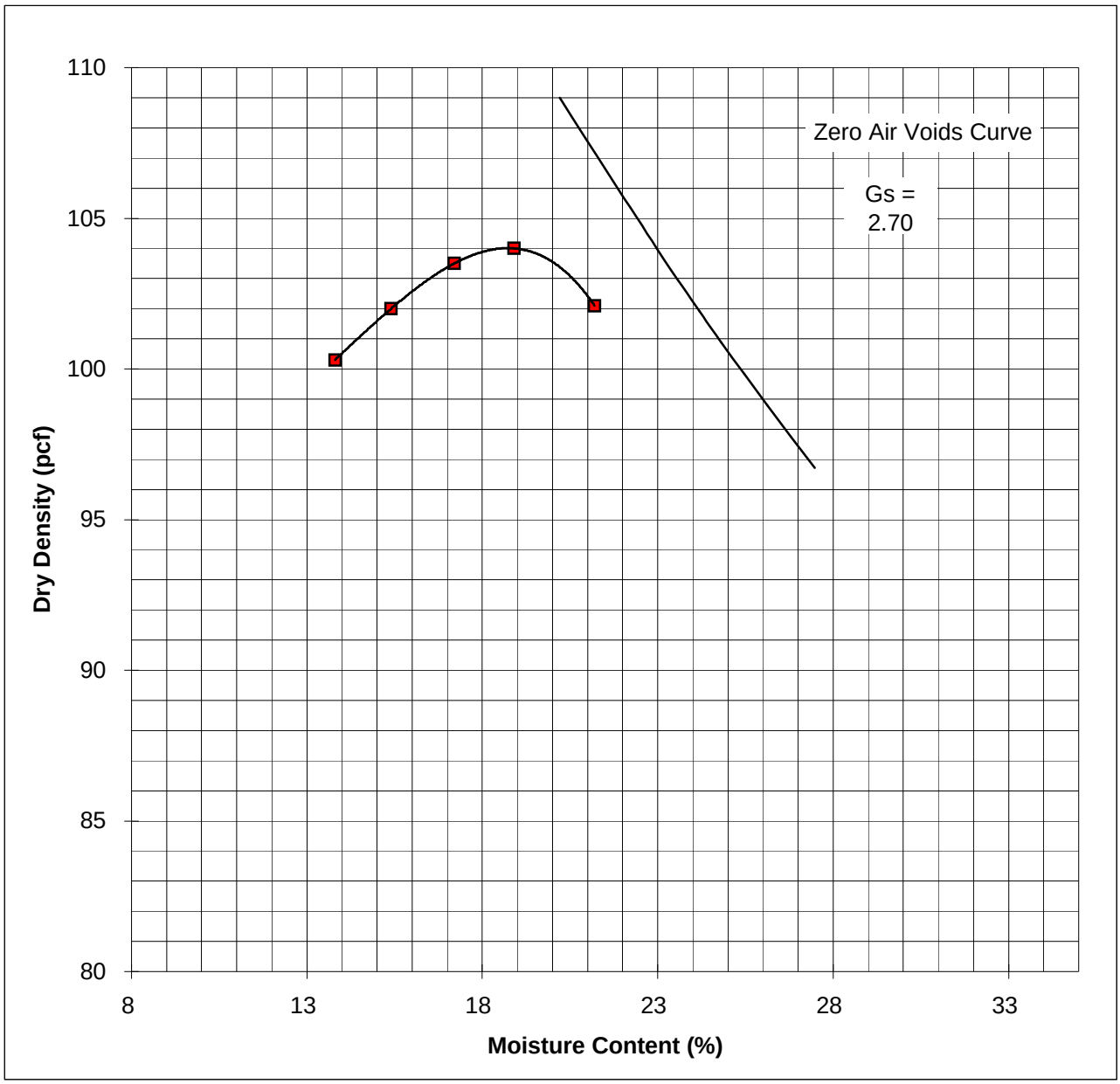
Sample No.	CBR-2	Natural Moisture Content	15.0
Street	BH-055, 0-10'	Percent Passing No. 200 Sieve	48.3
Station		Percent Retained on No. 4 Sieve	0.1
Liquid Limit (LL)	32	Percent Retained on 3/4" Sieve	0.1
Plastic Limit (PL)	NP	Maximum Dry Density (pcf)	104.0
Plasticity Index (P	NP	Optimum Moisture Content (%)	18.0
Liquidity Index (LI)		Corr. Maximum Dry Density (pcf)	104.0
Description	Brown Silty Sand, Trace Mica	Corr. Optimum Moisture Content (	19.0
Classification	SM	Percent (%) Gravel as Tested	0.0
Specific Gravity	2.70	Percent (%) Gravel Total	0.1
Test Standard	VTM-1	Test Method:	A

Project: 36 - Route 29 Bypass **Project No.: 5924** **Date: 11/3/11**	**ECS Mid-Atlantic, LLC** **Fredericksburg, Virginia** **Moisture Density Relationship Curve**



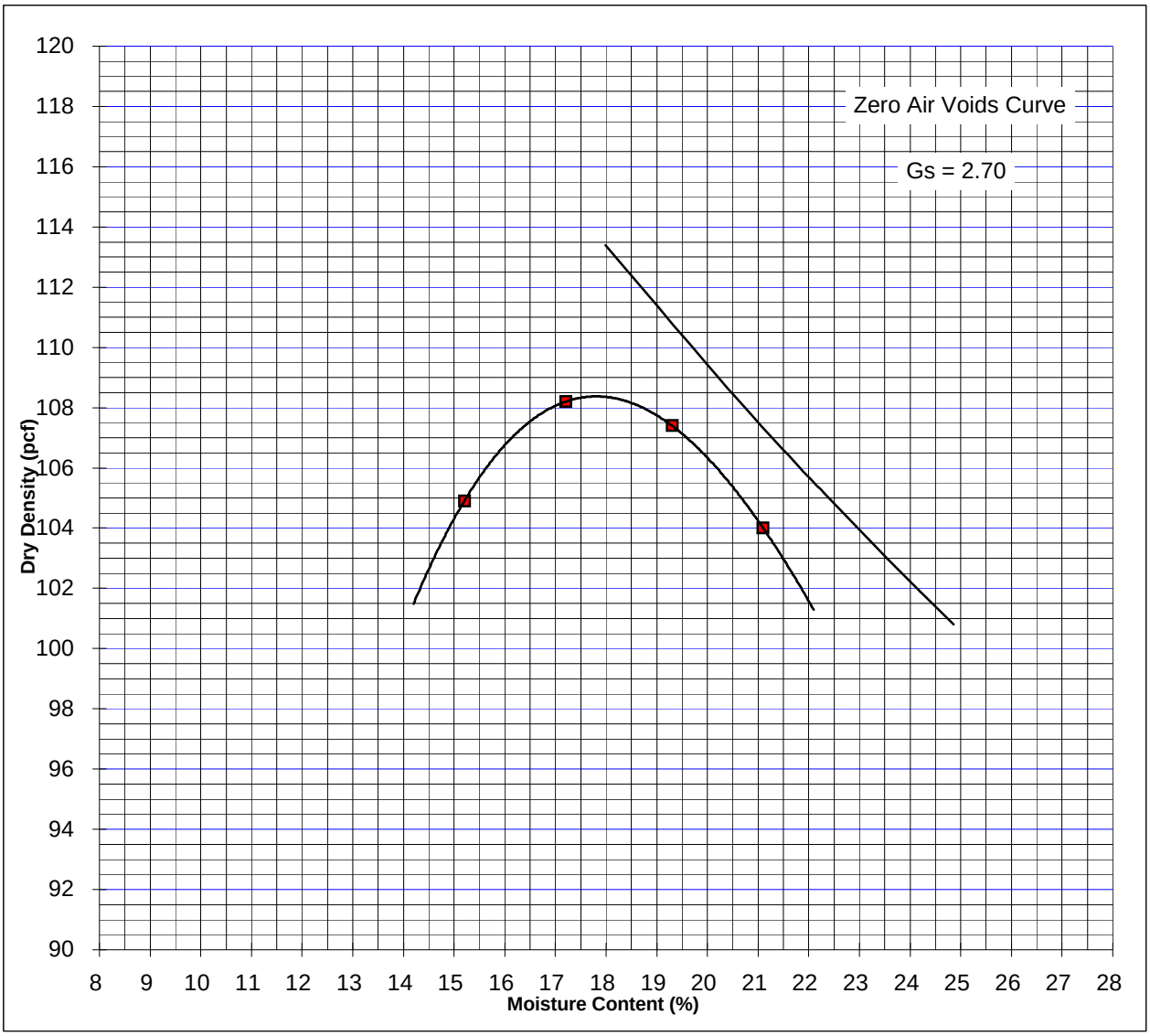
Sample No.	CBR-3	Natural Moisture Content	
Street	BH-104, 0-10'	Percent Passing No. 200 Sieve	50.2
Station		Percent Retained on No. 4 Sieve	4.2
Liquid Limit (LL)	30	Percent Retained on 3/4" Sieve	0.3
Plastic Limit (PL)	NP	Maximum Dry Density (pcf)	107.0
Plasticity Index (P	NP	Optimum Moisture Content (%)	18.0
Liquidity Index (LI		Corr. Maximum Dry Density (pcf)	107.0
Description	Brown & Red Sandy Silt, Trace Mica	Corr. Optimum Moisture Content (9	18.0
Classification	ML	Percent (%) Gravel as Tested	0.0
Specific Gravity	2.70	Percent (%) Gravel Total	4.2
Test Standard	VTM-1	Test Method:	A

Project: 36 - Route 29 Bypass **Project No.: 5924** **Date: 11/3/11**	**ECS Mid-Atlantic, LLC** **Fredericksburg, Virginia** **Moisture Density Relationship Curve**



Sample No.	CBR-4	Natural Moisture Content	18.3
Street	BH-124, 0-10'	Percent Passing No. 200 Sieve	63.4
Station		Percent Retained on No. 4 Sieve	5.9
Liquid Limit (LL)	31	Percent Retained on 3/4" Sieve	0.6
Plastic Limit (PL)	NP	Maximum Dry Density (pcf)	104.0
Plasticity Index (P	NP	Optimum Moisture Content (%)	19.0
Liquidity Index (LI)		Corr. Maximum Dry Density (pcf)	104.0
Description	Dark Green Sandy Silt	Corr. Optimum Moisture Content	19.0
Classification	ML	Percent (%) Gravel as Tested	0.0
Specific Gravity	2.70	Percent (%) Gravel Total	5.9
Test Standard	VTM-1	Test Method:	A

Project: 36 - Route 29 Bypass **Project No.: 5924** **Date: 11/3/11**	**ECS Mid-Atlantic, LLC** **Fredericksburg, Virginia** **Moisture Density Relationship Curve**



Sample No.	CBR-5	Natural Moisture Content	20.2
Location	11BH-002 (Route 29 Bypass)	Percent Passing No. 200 Sieve	66.9
Station	_	Percent Retained on No. 4 Sieve	7.6
Liquid Limit (LL)	NP	Percent Retained on 3/4" Sieve	2.8
Plastic Limit (PL)	NP	Maximum Dry Density (pcf)	108.4
Plasticity Index (P	NP	Optimum Moisture Content (%)	17.8
Liquidity Index (LI)		Corr. Maximum Dry Density (pcf)	No Cor. Required
Description	Yellow-Brown, Sandy Silt, Trace Mica	Corr. Optimum Moisture Content (%)	No Cor. Required
Classification	ML	Percent (%) Gravel as Tested	0.0
Specific Gravity	2.70	Percent (%) Gravel Total	7.6
Test Standard	VTM-1	Test Method	_

Project Name: Route 29 Bypass

Project No.: 36 1061 **Performed Date: 9/26/11**

ECS-MID-ATLANTIC, LLC Chantilly, Virginia

Moisture Density Relationship Curve